

# **INNOVATION MANAGEMENT, ENTREPRENEURSHIP AND SUSTAINABILITY 2017**

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Proceedings of the 5th International Conference





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# **Innovation Management, Entrepreneurship and Sustainability**

25 – 26 May, 2017, Prague



Organized by Faculty of Business Administration  
University of Economics, Prague



## **Foreword**

The 5th International Conference Innovation Management, Entrepreneurship and Sustainability (IMES 2017) took place on May 25-26, 2017 at the University of Economics, Prague. The conference was organised by the Department of Entrepreneurship of the University of Economics, Prague, Czech Republic in cooperation with Faculty of Management, Comenius University in Bratislava, Slovakia and Perm National Research Polytechnic University, Russia and other partners.

Sound keynote speakers – William B. Gartner (Copenhagen Business School), Bengt Johannisson (Linnaeus University), Jerzy Cieřlik (Kozminski University), Art Gogatz (World Innovation Team), Alistair J. Fee (Queen’s University Belfast), Lorraine M. Uhlaner (EDHEC Business School in Roubaix), Matt Johnson (Leuphana Universität Lüneburg), and Martin Lukeř (University of Economics in Prague), discussed the trends in the fields of innovation management, entrepreneurship and sustainability. The conference aimed to achieve academic excellence in a regional context and to establish a platform for mutual collaboration, exchange and dissemination of ideas among researchers and professionals.

This conference proceedings contain contributions of the conference participants presented during both days of the conference. Authors of papers come from 20 countries all over the world, namely from Canada, Croatia, Czech Republic, France, Germany, Hungary, Chile, Lithuania, Nigeria, Paraguay, Poland, Russia, Serbia, Slovenia, Slovakia, Spain, Sweden, Switzerland, Turkey and USA. All these contributions have successfully passed the doubleblind peer-review process.

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**FINANCIAL INNOVATION AND ENTREPRENEURSHIP  
DEVELOPMENT IN LAGOS STATE OF NIGERIA: CHALLENGES  
AND PROSPECTS FOR SMALL AND MEDIUM SCALE  
ENTERPRISES**

**Chukwunonye Anyakoha – Chinyere Nwolisa**

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**Abstract**

**Purpose:** The study is to analyzed the various sources of funding for small and medium scale enterprises (SMEs) in Lagos State of Nigeria, examine the challenges they face an accessing funding from theses source and to highlight available innovative means of financing enterprises via innovative means like crowdfunding.

**Design/methodology/approach:** Empirical analysis was conducted using descriptive design. A total of 600 (six hundred) structured questionnaires were distributed to SME operators, of which a total of 500 (five hundred) were filled and returned.

**Findings:** Conventional funding sources such as bank loans and retained profits were both difficult to access, and their usage is beset with numerous challenges. Furthermore, low level of knowledge of crowdfunding, scepticism and lack of appropriate regulatory framework are factors hindering successful operation of crowdfunding in Lagos State of Nigeria.

**Research/practical implications:** This research work has implications for SMEs and also for regulators. For SMEs, it exposes a veritable alternative in accessing funds, while for regulators, it highlights a new frontier for monitoring and evaluation of internet utilization in fund raising. It also educates the member of the public who are internet savvy of the good use of the internet in supporting SMEs.

**Originality/value:** This study has an originality value of using primary data collected by SME operators in Lagos Nigeria.

**Keywords:** Financial innovation, Entrepreneurship, Sustainable development, Economic growth, Crowdfunding

**JEL Code:** M00, O16, M21

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## **Introduction**

SME performance is a key element for economic development in any country. According to Aigboduwa and Oisamoje (2012), the growth of entrepreneurship and the development of SME's are a major indicator of economic performance of every country. In order for firms to perform optimally, there is a need for appropriate financing, especially at the start-up phase. Financing plays a key role in the growth of entrepreneurship and SME growth, due to the fact that it helps small businesses to withstand the initial years of growth when profits and cashflow cannot be able sustain needed growth. Financing is however the biggest challenge faced by small businesses, especially in developing economies (Alese and Alimi, 2014). Financial innovation has been a major issue both in the service sector and production sector of Nigeria's economy. It has also been mentioned as a major element needed for the growth and development of entrepreneurship in developing economies like Nigeria. It has been a major talking point amongst policy makers and stakeholders in the financial sector. Financial innovation has been defined as the act of creating and also marketing new financial instruments, as well as financial technologies, markets and institutions (Allen, 2012). It is made up of institutional innovation, product innovation and process innovation. Institutional innovation involves the creation of new types of financial firms, while product innovation relates to the creation of new types of financial products such as derivatives and foreign currency mortgages. Process innovation involves the creation of new ways for doing financial businesses, such as online banking and telephone banking. Financial innovation also involves the creation of new ways for raising funds for entrepreneurship ventures, using means such as crowd funding. Financial innovation is vital for the growth and development of SME's, especially in a developing economy like Nigeria. This is based on the fact that there are limited sources of funding for entrepreneurs, thus creating is a need for more innovative forms of funding so as to bridge this gap. The existence, survival and success of SMEs are vital for economic development, by creating jobs and also contributing tax revenue to the government. This paper is therefore aimed at exploring the various sources of funding for entrepreneurship ventures and SME's in Nigeria, the challenges besetting these aforementioned sources of funding and innovative means of funding and financial intermediation that will help these firms ameliorate these challenges. The study is delimited to manufacturing firms within Lagos State of Nigeria. Lagos State was chosen based on the fact that it has the highest concentration of entrepreneurship activities and SMEs in Nigeria.

## **1 Problem Statement**

The performance of Entrepreneurship and SME's in Lagos State, and Nigeria at large has improved on the average over the past 25 years, but at a very slow rate that is not compatible with targeted growth. According to Taiwo, Falohun and Agwu (2016) a study on SMEs in Nigeria between 1985 to 2015, merchandise exports has increased on the average of 3.4% per annum. They further mentioned that the main challenge facing SME's Nigeria is the issue of funding and this prevents organizations from functioning optimally, thus obtaining sub-par results. Also, Eniola (2014) in his study mentions that SME performance contributes immensely to economic growth in Nigeria. However, due to certain barriers, such as low level of financing and limited access to existing finance, these entrepreneurs and SMEs cannot perform to their potential, thus preventing the country from achieving its Sustainable Development Goals (SDGs).

Small and Medium scale Enterprises in Nigeria have experienced considerable level of growth over the past 20 years. There has been a steady increase in their number as more people now embrace entrepreneurship. Also, a good number of government intervention programs aimed at promoting entrepreneurship have led to the increased interest in entrepreneurship, especially on the part of youths. According to Ogbulafor, Malaolu and Elias (2013) entrepreneurship development and SME performance is directly related to the economic performance of a nation. They mentioned that SME growth is necessary in the alleviation of poverty, evolution of economic growth, increase employment, output and innovation. Oni and Daniya (2012) in their study mentioned that SMEs constitute the essential in the lubrication and development of a country's economy. They further pointed out that the growth in SME performance is directly related to national economic growth. SMEs in Nigeria have grown in number over the past 25 years. Despite the high number of SME's in the country, the death rate of small businesses is high in the country, with studies showing that 4 out of 5 new businesses fold up every year (Eniola and Entebang, 2015). In spite of the resilient entrepreneurship spirit and high number of SMEs in Nigeria, the level of growth is not yet satisfactory in helping the country to meet the Sustainable Development Goals (SDGs). This challenge thus calls for innovative solutions and strategies in order to develop entrepreneurship in Nigeria.

### **1.1 Financing Situation of SMEs in Nigeria**

The financing challenge of SME's in Nigeria has been a very important topic over the years. Capital is fundamental for the success of any business, thus the paucity of business funds does

not allow a small business to survive through the start-up phase and grow. Nwachukwu (2012) in his study posits that SMEs in Nigeria have not performed up to potential and have thus not contributed enough to national growth and development. Entrepreneurs are also beset with the difficulty of not knowing about available sources of funding for their ventures. This was buttressed by Claessens (2006) where he mentions that a major challenge facing entrepreneurs is the low level of knowledge of available financing, the quantity of financing available and how to access the financing. In another related study, Onwuegbuchunam and Akujuobi (2013) mention that the Nigeria Government, commercial banks and other funding bodies are positively skewed towards financing enterprises in the formal sector to the detriment of those in the informal sector. Table 1 shows commercial bank loans to SMEs in Nigeria; it shows that there has been an average decline in percentage of total credit to SMEs by banks since 1994. It also shows a very low percentage proportion given to SMEs relative to total bank loans. The need to find an intervention in order to stop this trend has brought about the need for more innovative financing methods for entrepreneurship and SMEs.

A World Bank Report on SMEs in Nigeria shows that 600 million jobs are needed in the next 15 years in order to absorb Nigeria's growing work force. Furthermore, the report mentions that 51.3% of SMEs in Nigeria lack access to finance. These buttresses the financing gap that exists for SMEs in Nigeria and also shows that the biggest challenge to entrepreneurs in Nigeria is limited access to funding (World Bank, 2012).

**Tab. 1: Aggregate Loans by Commercial Banks to SMEs in Nigeria**

Year	Commercial Bank Loans and Advances to SMEs (₦ million)	Total Commercial Bank Credit (₦ million)	Percentage of SME Loans to total credit given by banks (%)
1994	20,552.50	92,624.00	22.19
1995	32,374.50	141,146.00	22.94
1996	42,302.10	169,242.00	25.00
1997	40,844.30	240,782.00	16.96
1998	42,260.70	272,895.00	15.49
1999	46,824.00	353,081.10	13.26
2000	44,542.30	508,328.20	8.76
2001	52,428.40	796,164.80	6.59
2002	82,368.80	954,628.80	8.63
2003	90,176.50	1,210,033.10	7.45
2004	54,981.20	1,519,242.70	3.62
2005	50,672.60	1,899,346.40	2.67
2006	25,713.70	2,524,297.90	1.02
2007	41,100.40	4,813,488.80	0.85
2008	13,512.20	7,806,751.40	0.17
2009	16,366.50	9,667,876.70	0.17
2010	12,550.30	9,198,173.10	0.14
2011	15,611.70	9,614,445.80	0.16
2012	13,863.50	10,440,956.30	0.13
2013	15,353.00	11,591,979.40	0.10
2014	16,010.20	12,312,501.90	0.13
2015	16,891.40	12,929,714.80	0.13

Source: Central Bank of Nigeria Statistical Bulletin, 2016.

## 2 Financial Innovation as an Intervention Strategy

Studies have shown that financial innovation has proved to be a possible intervention measure for SME difficulties, especially in developing economies, like Nigeria. Eniola (2014) in his study mention that financial innovation is a key catalyst in ameliorating the challenges that SME's face in developing economies. Furthermore, Eniola and Entebang (2015) also opine that financial innovation, which involves the process of creating not financial products and also modes of delivery of financial services, goes a long way in ameliorating some of the challenges that entrepreneurs and SMEs face in Nigeria and other developing economies. In order to

overcome these financing challenges besetting entrepreneurs, the role of financial innovation has become increasingly important in helping entrepreneurs to access the funds that they need to grow their businesses and contribute to economic growth. This gap in financing, coupled with the ascent of social media and interactive online communication platforms, has led to the pursuit of innovative forms of enterprise financing via the means of crowdfunding, as it mainly uses online and social media platforms.

## **2.1 The Crowdfunding Solution**

Crowdfunding is the method of funding a business project by raising financial contributions from a dependable range of people via cyberspace. It involves funding a project by raising monetary contributions from a large number of people, usually contributing relatively small amounts of money, and it is done via an online platform (World Bank, 2013). The rise of the social media has also led to increasing popularity of crowdfunding. It is an interesting phenomenon as it intersects management, information systems, sociology, economics and finance. It is a method adopted by entrepreneurs who are refused funding by commercial banks and they use the opportunity to appeal to small investors. According to Pierrakis and Collins (2013), crowdfunding provides funding for commercial ventures through multiple small-scale investors. They further mention that crowdfunding eliminates geographical barriers to raising finance and serves as a unique path to identifying good investments. Crowdfunding has gained massive ground and popularity in developed economies like the United States of America. According to Ijatomi (2012) in his study titled “Crowd Funding Could Boost Small Business Financing in Nigeria” mentioned that in 2011 alone, crowd funding raised more than \$1.5 billion in the USA, and increasing to \$34 billion in 2015.

Crowdfunding is a fast growing and continuously developing phenomenon. However, Nigeria and Africa as a whole has not fully embraced it. This could be attributed to issues such as lack of knowledge of its existence, a low level of knowledge of its use and scepticism of its workability in Nigeria. However, for a developing economy, it offers great potential for a developing economy. In a World Bank Report of 2013 titled “Crowd Funding’s Potential for the Developing World”, it mentions that with increased access to smart phones by Africans, innovative means of financing entrepreneurship ventures such as crowd funding that relies a lot on the internet will make a well needed in-road into developing economies and help such countries to awaken the substantial reservoirs of entrepreneurship talent, activity and capital. It offers developing economies like Nigeria the opportunity to drive growth and stimulate innovation. The report further mentions that crowd funding could help developing economies

to leapfrog the traditional capital market structures and financial regimes that exist in these countries. There has been a steady growth in crowdfunding and the number of crowdfunding platforms in Africa, due to the high demand for capital. As at the end of 2015, there are 57 crowdfunding platforms with their headquarters in Africa, with more than 50% based in South Africa.

Crowdfunding offers three distinct opportunities for entrepreneurs in Africa. Firstly, it creates more avenues for business to access capital. It enables the entrepreneurs to appeal directly to its potential customers, investors or supporters without the cumbersome process of enquiries into their creditworthiness. Secondly, as a purely digital mechanism, African crowdfunding can leverage on the increased use of mobile networks in Africa to transact business. Thirdly, crowdfunding platforms subsidize the costs of marketing and promotion by allowing entrepreneurs to use the platform for free because the platforms in Africa have no subscription costs.

Despite the benefits of using crowdfunding, it is recommended that governments should review and update small business regulations so as to balance investor protection with capital formation. Also, individuals should be involved in online social networks because this is the main driver of crowd funding activity. The World Bank, in their report, further recommends that in order for crowdfunding to work in a developing economy like Nigeria, there should be increased access to reliable broadband internet and mobile services and also, the private sector should be engaged to help create channels of viable businesses that can become potential investment opportunities.

### **3 Statement of Problem**

The challenges that are faced with obtaining funding for entrepreneurship in Nigeria are enormous, and due to the increased propensity for entrepreneurship by young people, it gets even tougher. The need for innovative forms of financing is important in order to bridge the existing funding gaps. Commercial and micro-finance bank loans are not enough to meet with SME needs in the country. Start-up firms are also unable to cope with the interest rate of commercial bank loans. Crowdfunding is an innovative form of financing entrepreneurial activities, and it has gained much popularity, especially in developed economies. It has proved as a viable alternative form of raising funds for entrepreneurial ventures in the developing world with much success, and should be tried in a developing economy like Nigeria. This study thus aims at highlighting the different sources of funding for entrepreneurship in Nigeria, the

difficulties involved in the main sources of funding used by entrepreneurs in Nigeria and the viability of the crowdfunding alternative for Nigeria SMEs and entrepreneurs.

## **4 Methodology**

This research employed a survey approach. Primary data was used for this study. A total of 600 (six hundred) structured questionnaires were shared to SME operators in the manufacturing sector in Lagos, Nigeria. A total of 500 (five hundred) of these questionnaires were filled and returned. Lagos State is Nigeria's commercial capital and the hub for manufacturing and service industry in the country, and as such, this informed the decision to carry out the study in Lagos. Furthermore, big businesses in Nigeria have their headquarters in Lagos, and the business model used by SMEs in Lagos, and they are also exposed to similar challenges. Data was analysed using frequency score with the Statistical Package for Social Science (SPSS) version 18.

### **4.1 Limitation of Study**

The study is limited to small and medium scale businesses operating in Nigeria. The businesses being considered are in the manufacturing sector. They are considered because manufacturing is a key driver of economic growth (Alese and Alimi, 2014) as it helps in improving the balance of payment (BOP) position of a country by increasing exports, creating employment and improving capacity utilization. Therefore, entrepreneurs in the manufacturing sector of the economy were chosen due to the fact that they lead the in terms of innovation and are a major economic driver. Furthermore, the location of the study is Lagos, the commercial capital of Nigeria. The study and findings are those limited to SMEs within Lagos State of Nigeria.

## **5 Findings**

The findings of the study are shown below in line with the specific objectives of the study

- i. Sources of funding for entrepreneurship and SMEs in Lagos State of Nigeria and challenges associated with them.
- ii. Workability of crowd funding as a creative form of funding entrepreneurship ventures in Lagos State
- iii. Challenges that face the implementation of crowd funding in Lagos and the role of different stake holders in the successful implementation of crowd funding in raising funds for entrepreneurship activities in Nigeria.

**5.1 Sources of funding for Entrepreneurship and SMEs in Lagos and Challenges Associated with them.**

From the questionnaires filled and returned, the respondents mentioned that their most common source of funding are shown in Table 2

**Tab. 2: Sources of Funding for Entrepreneurs**

No.	Source of Funding	Number of respondents adopting the means of funding	Percentage
1	Personal savings	417	83.4%
2	Contribution from family and friends	358	71.6%
3	Grants from donor organizations	325	65.1%
4	Loans from micro-finance banks	292	58.4%
5	Loans from commercial banks	166	33.2%

The responses show that commercial bank loans are the least in terms of sources of funds for entrepreneurship ventures. It also shows that commercial bank loans rank as the lowest source of funding amongst entrepreneurs in Nigeria.

The challenges that are associated with the different forms of funding are shown in Table 2. It shows that the different conventional source of funding for entrepreneurs has given disadvantages.

**Tab. 3: Challenges of the Different Sources of Funding**

No.	Source of Funding	Challenge	Percentage of Respondents agreeing
1	Loans from Commercial Banks	1. High interest rate 2. Heavy collateral requirement 3. Non-availability of collateral required by commercial banks	71.6% 82.0% 64.2%
2	Personal Savings	1. Insufficiency of savings for business venture. 2. Fear of losing life savings in business venture. 3. Risk of losing personal assets in event of business failure.	71.6% 70.0% 68.0%
3	Contributions from Family and Friends	1. Insufficiency of raised funds for enterprise. 2. Fear of the effect of losing money on relationships. 3. Possible high interest rates.	62.0% 58.0% 63.0%
4	Grants from Local and International Organizations	1. Limited availability of funds from this source. 2. Inability to package business proposal for such grants.	52.0% 58.0%
5	Loans from micro-finance banks	1. Heavy collateral requirement. 2. High interest rate on loans.	65.0% 71.2%

On the issue of challenges to using crowdfunding for financing entrepreneurship and SME's in Nigeria, the response of the business managers are shown in Table 4. It shows that a low level of knowledge and awareness of crowdfunding and an absence of investor protection and regulatory framework are the leading causes of its lack of use in Nigeria. Furthermore, scepticism in the use of online and social media platforms for financial transactions and a low level of knowledge of the procedures for online financial are also reasons for its apparent non-existent level of usage in Nigeria. It is therefore recommended that the organized private sector, in collaboration with the Securities and Exchange Commission of Nigeria educates investors on the workings of crowdfunding and also that appropriate regulatory framework be established in order make for investor protection.

**Tab. 4: Factors Hindering Utilization of Crowdfunding in Lagos**

No.	Challenge to Crowdfunding Usage	Frequency	Percentage
1	Low level of knowledge of the workings of crowdfunding	356	71.2%
2	Scepticism of financial dealings via social media and online platforms	260	52.0%
3	Knowledge of procedures for online financial transactions	291	58.2%
4	Absence of regulation and investor protection mechanisms	351	70.2%

## Conclusion

This study was aimed at highlighting the different sources of funding for entrepreneurship, the challenges associated with obtaining funding via the different sources and creative forms of financing that can be used to bridge the existing funding gap in entrepreneurship. Results from the study show that the common forms of obtaining funding for SMEs are fraught with various challenges which are not easily surmountable by entrepreneurs. Crowd funding means of finance was considered as an innovative and viable alternative means of financing entrepreneurship ventures in Lagos State. Crowd funding has helped raise billions of dollars for entrepreneurial ventures in developed economies, but it has not been able to replicate the same feat in a developing economy like Nigeria, which the study shows, is due to a number of factors, including low level of knowledge of crowd-funding by prospective and existing entrepreneurs, lack of appropriate regulatory framework to regulate activities and the relatively low level of use of ICT and social media for commerce in Lagos State. The study thus recommends that the organized private sector, in conjunction with the Securities and Exchange Commission (SEC) educate the investing public on how to participate in crowd funding activities and also sensitize them on safe and effective use of the internet for business transactions. Furthermore, the study also recommends that appropriate regulatory framework and investor protection rules in order to encourage patronage, especially from small scale investors.

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## THE ANALYSIS OF VARIABLES INFLUENCING SATISFACTION AND MOTIVATION OF EMPLOYEES IN THE WORKING PROCESS

**Radovan Bačík – Richard Fedorko – Jakub Horváth – Marek Propper**

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### **Abstract**

**Purpose:** The aim of the article is to identify and describe the important relationship between the age of employees and the assessment of selected variables “work satisfaction“ and “motivation – lack of motivation“ on the basis of the research.

**Design/methodology/approach:** The research made use of the material obtained from primary sources. The primary sources were data collected from questionnaires filled out by inhabitants of Slovakia. The sample consisted of employees of SME’s. Using the method of random sampling we identified 442 SME’s. Within this group we have reached out to a total of 665 employees. The research sample included 136 respondents. The research sample consisted of employees of various organizations, like those working in the manufacturing sector, commerce, services and administration.

**Findings:** The analysis of the links between the age of employees and their motivation/ disincentives pointed to a statistically significant connection showing that older employees have lower level of motivation and lack interest in their career.

**Research/practical implications:** Based on the results of the analysis we believe that it is really difficult to predict which direction the investigated issue will take in the future. Presented findings, however, indicate the fact that employees prefer different attitudes, opinions and ideas and often need to individually deal with many situations and forms of behavior. In practical terms, the findings will help SME’s to understand and influence motivation of different age groups of employees.

**Originality/value:** The aim of this paper is to help SME’s to better understand links and the variables that influence motivation and employee satisfaction at work in today's ever-changing market environment.

**Keywords:** motivation, disincentive, employees, work process

**JEL Codes:** M10, M12

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## **Introduction**

The current times and the relative infinity of human needs provide managers with a large amount of stimulants that can be used to motivate their employees (in large companies as well as SME's). Motivation in general can be understood as a group of internal stimuli, goals, attitudes of a person towards certain situations (Míkva, 2007). Motivation must come directly from an employee. Each person (employee) can perform better provided there is a reason for doing so. People are never motivated by only one motive, motives are usually interrelated and influence each other. Human action is not generally influenced by a single motive but rather by a whole set of motives. Motivating people is a key aspect of managerial work (Birknerová, 2011). Successful motivation requires time and care. Employees are motivated intrinsically as well as extrinsically (Osterloh and Frey, 2000). Employee motivation tasks should be carried out through a variety of activities that are part of the management process topped with custom techniques (Lauby, 2016; Strauss et al., 2017). This means that the process of employee motivation should feature several aspects (personal interests, efforts of employees, the needs of the business unit and the whole organization), which are the result of purposeful actions of managers, HR professionals and employees (Blašková, 2003). Employee motivation in SME's is faster and more efficient and allows for the usage of different means.

The concept of job satisfaction can be understood from several points of view. One of the points of view links employee satisfaction with company's care for employees (Forsyth, 2009). Work satisfaction can also be understood as an emotional response to various aspects of work (Smékal, 2007). Perception of differences in understanding the concept of satisfaction is important for understanding the connection between employee satisfaction and motivation. The aim of employee satisfaction survey is to identify factors that are important to employees in terms of motivation and understanding the degree of satisfaction with these factors, identify factors that work demotivationally, identify ways of solving a particular problem and finding out its causes (Birkner, 2011). The strongest relationship between satisfaction and motivation is created when the employee is fully satisfied with the character and content of his work. The higher the satisfaction, the higher the motivation to work (Sprenger, 2010).

Attracting good employees is the issue that SME's have to deal with every day. SME's realize it is the employee who is the creator of the product and that only a good employee will increase its commitment (Birknerová, 2011; Frankovský et al., 2015; Lajčín et al., 2012). However, only a happy employee is a good employee. Providing standards set out by the Labor Code is already inadequate. If SME's want to succeed, they must offer their employees a little

more (Lauby, 2016; Porter et al., 2016). Based on the current state of the issue it can be stated that the problem of motivation is highly discussed and research area of knowledge. The authors researching this field of knowledge focus predominantly on examining the variables responsible for motivating employees. Strauss et al. (2017) in their studies deal with the issue of proactivity and motivation which moderates the effects of active behavior of the work effort of employees. Further research in this area explored innovative working practices and the use of ICT to motivate employees. Martin (2017). Loosemore - Lim (2017) address the interconnectedness of social responsibility of companies with a performance of businesses active in the construction sector. Ratiu et al. (2017) studied the development of management skills and motivation using coaching. Based on the survey conducted by Visually (2016) it can be stated that 70% of workers in SME's are motivated by non-financial rewards. 83% of employees in SME's are motivated when their work is being recognized, 76% are motivated by the possibility of career advancement, and 90% consider fun environment highly motivating. Based on the aforementioned reasons, we decided to focus our research on examining the motivation or lack thereof of employees of SME's.

## **Methodology**

Our research focused on the mapping employee satisfaction, wages, their motivation to work and their overall well-being of employees. The mathematical and statistical validation focused on the link between the age and variables of work satisfaction and motivation. On the basis of the above we have formulated the following hypothesis:

**H<sub>1</sub>:** We assume there exists a link between age of employees and selected variables of work satisfaction and motivation - lack of motivation.

The sample consisted of employees of SME's (manufacturing sector, service, administration). Using the method of random sampling we identified 442 SME's (manufacturing sector, commerce, service, administration) active in the Slovak republic. Within this group we have reached out to a total of 665 employees. The research sample included 136 respondents (respond rate at the level of 20.45%).

Data collection was conducted through a questionnaire containing 5 questions focused on demographic issues, 3 questions regarding wage, 8 questions regarding job satisfaction, 20 questions regarding motivation or lack thereof. The questionnaire was aimed exclusively at employees. The variables of motivation, demotivation and job satisfaction were defined on the basis of the input analysis - a personal interview on the sample of SME's employees. For the purpose of this paper the following section describes only selected questions. The questionnaire

was distributed to respondents in electronic form to their e-mail addresses. Data collection was conducted during September-October 2015. The subsequent mathematical and statistical verification of the hypotheses was carried out using the statistical program SPSS. The research analyzed the interdependencies between selected characteristics of Constructive thinking and Social intelligence versus positive and negative emotions at work using the Goodman and Kruskal's gamma correlation.

The demographic variables included gender of respondent, education, age and experience in the field. As for the gender, 64.70% (88) of respondents were men and 35.40% (48) were women. The age structure of the examined respondents was as follows: respondents aged 18-25 years accounted for 8.82% (12), respondents aged 26-35 years accounted for 38.97% (53), respondents aged 36-45 years accounted for 36.76% (50), respondents aged 46-55 years accounted for 11.03% (15), respondents aged 56+ years accounted for 4.41% (6). As for the education, the largest group consisted of employees with secondary education with school-leaving exam 50.70% (69), 44.90% (61) of respondents declared some form of higher education.

**Tab. 1: Years of work experience**

Years of work experience	Number	Percentage
1-5 years	28	20.60%
11-15 years	31	22.80%
15 and more years	45	33.10%
6-10 years	25	18.40%
Less than a year	7	5.10%

Source: own elaboration

Respondents who have worked in their field for less than a year accounted for 5.10% (7). Those with experience between 1-5 years accounted for 20.60% (28). Those with experience between 6-10 years accounted for 18.40% (25), those with experience between 11 to 15 years accounted for 22.80% (31) and those with experience of more than 15 years accounted for 33.10 % (45).

**Tab. 2: Satisfaction with wage**

Wage - satisfaction	Number	Percentage
Definitely agree	23	16.90%
Agree	86	63.20%
Do not know	4	2.90%
Disagree	18	13.20%
Definitely disagree	5	3.70%

Source: own elaboration

The question “Is wage the most important variable in your employment?” attracted the following responses: 63.20% (86) of the respondents stated they agree, 16.90% (23) of respondents stated they definitely agree with the statement, 13.20% (18) disagreed with the statement and 3.70% (5) of the respondents stated they definitely disagree. 2.90% (4) of respondents stated they do not know.

## Results

The obtained results confirmed the existence of predicted statistically significant correlations between the variables age and work satisfaction (Table 3). With the increasing age of employees, the importance placed on promotion declines. Older employees (56-65-year-old employees) no longer seek career opportunities and therefore promotion becomes a non-issue. They are already doing their work sort of automatically, they have a lot of experience and do not address the issue of competitiveness and promotion. These employees perceive their well-being at work the be the most important (this can be probably linked with their upcoming retirement). On the other hand, the possibility of career progress and subsequent job satisfaction in employment is very important for younger employees (employees aged 18-36). Our results confirmed the existence of statistically significant correlations between age and work satisfaction (Table 3). The older the employees the lower their job satisfaction. These employees tend to like peaceful and quiet environment, much like what they already have at home. On the other hand, younger employees want to enjoy their work, want to achieve the desired results. Moreover, it is important for them to achieve outlined goals because only then they feel satisfied at their work.

**Tab. 3: Relation between age and job satisfaction of employees**

Variable	Age
Interesting work	
Joy of work	,325**
Flexible tasks	
Wage	
Promotion	,329**
Competitiveness	
Recognition from co-workers	
Recognition from superiors	

\*  $p < 0,05$ , Source: own elaboration

**Tab. 4: The link between age and motivation – lack of motivation**

Variable	Age
Unstable job	
No career development	,240**
No increase in pay	
Wage	
No bonuses	
Mundane work	,270**
Not enough space to carry out ideas	
Failing management	
Poor relations with superiors	
Unfair superior	
Difficulties at work, bossing	
Bad relations in the workplace	,182*
Non-work relations and friendship in the workplace	,174*
Bad communication and poor flow of information within the company	,247**
No flexitime	
Bad working environment (physically)	,223*
Bad OHS	
No sickness insurance and pension insurance	
No employee benefits such as training, leaves	
Bad reputation	

\*  $p < 0,05$ ; Source: own elaboration

As for the analysis of the link between age and motivation – lack of motivation we analyzed the interdependencies between the selected characteristics of Constructive thinking and Social intelligence versus positive and negative emotions at work. Table 4 describes links between subjective well-being (positive and negative emotions) and Constructive thinking.

The results confirmed the existence of the predicted statistically significant correlations between age and motivation variables influencing employees at work. The variable age correlates with the variable no career development and mundane work.

With increasing age of employees, the link between age career development and mundane work weakens. Older employees tend to stop minding mundane work and do not care about career development. Basically, they do not want to change their job or even address this issue.

Other age-related variables include bad mutual relations in the workplace, non-work relations and friendship in the workplace, poor communication and poor flow of information, as well as bad working environment (physically).

Older employees are not concerned with dealing with bad relations in the workplace. Older workers often do not want to address issues relating to co-workers, working atmosphere and they often perceive their job in the terms of years worked. They often do not care about non-work relations and friendship in the workplace. Younger employees often behave contrary

to what was written above - they try to create working groups and good working environment. This may be due to the fact that work is a sort of second home, which means they want to create friendships and relationships. Another important finding is the fact that older employees stop caring about the bad communication and bad information flow within the company and do not solve problems within the company as quickly as they used to. They tend to overlook bad information flow because they do not want to get into conflicts. Older employees tend to care less about the environment they work in (cleanliness, light, noise, temperature and the like). On the contrary, younger workers tend to deal with these problems more often since they see their future in the company.

The research confirmed the hypothesis under which we assumed the existence of significant interrelations between age of respondents and assessment of selected attributes of work satisfaction and motivation – lack of motivation.

## **Conclusion**

The market environment is constantly changing, that is without a doubt. One of the conditions that determine the success of a business entity operating in such a volatile, turbulent environment, is the quality of its human resources. Motivation and management of human resources is today one of the most dynamic components of SME's management. Knowledge and application of theoretical knowledge from this field into practice is of great importance in terms of competitive advantage.

Lack of motivation show itself in unstable jobs where workers feel threatened and fear for their job, thus lacking proper motivation to work better. Lack of motivation is often the result of no career development opportunities, wage stagnation and lack of bonuses. The motivation of these workers is declining thus leading to dissatisfaction at work and doubts. Lack of motivation is also the result of to unfair treatment by their boss or co-workers.

We recommended for SME's to include older workers into internal issues a bit more, they have a lot of experience after all. They should be more involved in group work, where everyone has their share of power and thereby continue in building relationships in the workplace with other employees.

Entrepreneurs should not underestimate the issue of motivation – lack of motivation and job satisfaction. We recommend SME's at least once a year to conduct an interview between subordinates and supervisors or carry out an anonymous questionnaire to examine employee opinions and attitudes in order to increase motivation and the overall job satisfaction. The

variables we investigate are one of the key components of the identification process regarding motivation. The most important variables that SMEs should analyze are job satisfaction, career advancement, bad communication, bad relations in the workplace and poor physical working conditions. Employee survey is also a manifestation of the company's interest in its employees. If the company underestimates the power of showing interest in employees, it may give the impression that the company does not care about them or their work. Such an attitude can then have a demotivating effect on employees.

Based on the results of the analyzes we dare to state that it is really difficult to predict what direction the researched issue will take. Presented findings, however, indicate the fact that employees have different attitudes, opinions and ideas and it is often important to deal with many situations individually. The findings should help SME's to understand the issue of human resources a bit better, in motivation. Ultimately, employees are the most important capital of any company.

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## THE ROLE OF SOCIAL MEDIA IN THE LIGHT OF BUILDING A STRONG ONLINE BRAND AWARENESS

**Radovan Bačik – Ludovit Nastisin – Beata Gavurova**

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### **Abstract**

**Purpose:** A brand is no longer what we tell the customer, it is what customers tell each other. The importance of using a social media mix for marketing purposes has never been greater than it is today. Ignoring these tools can have unfavorable effects on any company, whether in the form of lack of competitiveness or in the case of unnecessarily high costs for promotion with weak effect and targeting. We aim to examine the relationship between perceived knowledge of the use of social media along with the frequency of their use, their potential impact on subscribing to the content of the company's social media accounts.

**Design/methodology/approach:** The paper examines the sample of 476 respondents questioned through the CAWI method - computer assisted web interviewing. A random sampling method has been used. All of them are active users of social media tools. Gathered data were subsequently processed with the methodical procedures of correlation analysis. Data collection took place during the first half of 2016.

**Findings:** We came to the interesting findings of the existence of presented relationships. These are accompanied with specific information about the use of particular social media among respondents, which also implies a clear preference and thus serve as assistance in determining the right mix of social media which should be used by the company.

**Research/practical implications:** The findings are subsequently transformed into a set of recommendations that help in setting the right marketing activities of companies in the online environment. There are also implications for the development of strong social media presence.

**Originality/value:** This paper fulfils an identified need to study how brand-supportive behavior can be enabled. The paper cope with the ever-growing phenomenon of social media in connection with the marketing activities as it is a necessary tool for the successful marketing mix. Also, this issue has not been examined enough within our region.

**Keywords:** social media, brand, marketing, tool

**JEL Codes:** M10, M31

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## **Introduction**

Every company wants to save its resources wherever possible. Even on advertising so they are trying to achieve best possible efficiency versus costs ratio. (Šoltés and Gavurová, 2014) And in this area, social media appear to be the leader in this factor. Social media is a cheaper advertising medium as compare to print, Radio or TV medium. The Fans who have LIKE your company pages are more likely to become your direct customers and whatever you post on your wall appears to your fans wall too. It means if you have 300 LIKES on your page at a time you can reach more than 1000 people depending on the nature of content and its quality. In some way, it is free advertising: you just need to know how to use this tool effectively. Every business has to keep in mind that social media is the fastest medium to reach your target audiences. Here you are not just updating your status, you are getting your customers feedback's immediately and that is your valuable content. Your customer's feedback helps you to get noticed and even sometimes makes you understand your drawbacks. Their LIKE's, SHARE's and FOLLOW's are their loyalty for you and indirectly they are recommending you to another customer. For e.g. a customer of cellular service provider share's its bad experience on wall of that particular company's Facebook page. So, company will resolve the issue instantly because finally its issue of their prestige. In a same way if the customers are happy with their services they post their photos and share's their experience with others and that way you are building a strong bond with your customers. Another important reason is that the social media page is going to allow the company to give a personal touch to their business. This is one of the best things that a small business can do to draw in customers. You can give your fans discount coupons. You can do survey online regarding your products. The customers are always going to know all of the events that are going on within the business and they will be able to tell the business whether or not certain things are going to work for the company. (Bacik et al. 2015)

*“Social media is about the people! Not about your business. Provide for the people and the people will provide for you.” – Matt Goulart*

## **1 Online social media**

In the context of social media, we are talking about communication tools that make use of Web 2.0. Communication takes place in the online environment through web and mobile technologies. (Haenlein and Kaplan, 2010) Social media has been around for several years and now are a part of our daily lives. Despite the fact that they have established themselves in our lives, it is still appropriate to see them as new forms of communication. The set of things these

media can cover is getting bigger, and, therefore, their application in the business and branding often results in improved indicators and increased brand awareness. (Kot, 2014) This form of communication complements the interpersonal process of communication (One to One) and mass communication (One to Many) as a kind of communication interface (Many to Many).

According to Safko and Brake (2009, p. 6) social media is defined as "activities, practices and behavior of people in communities that meet in an online environment to share information, knowledge and attitudes through media allowing conversation. These media are Internet-based applications enabling the creation and uncomplicated sharing of content in the form of text, images, videos or sound." This is an online space in which people with common interests gather to share ideas, views and comments. (Webber, 2009)

Andreas Kaplan and Michael Haenlein see social media as a group of Internet applications that allow the creation and exchange of user content. A more precise definition has been developed by David Meerman Scott (2010). According to him, social media allow people to exchange ideas and opinions, discuss the content of pages and make contact online. Social media is different from traditional media in that online content can be created by anybody and everybody can equally contribute by commenting it. Social media can have different forms: text, audio, video or photographs and other visual forms that bring communities closer together and accommodate people who want to share their ideas. " (Scott, 2013, p.215)

With regard to social media we can talk about four revolutions in this environment. According to Shih (2010), approximately once in a decade emerges a new technology that fundamentally changes the business environment. The first such revolution was the wide availability of computers in the 70s. Computers helped to automate and accelerate computational operations. The era of personal computers, which is characterized by the reduced size of these devices and improved performance soon followed. 90s were marked by the massive expansion of the Internet. The latest revolution was caused by the arrival of so-called "online social graph" at the beginning of this millennium, closely linked to the advent of social media.

In terms of marketing social graph brings a huge advantage for recommendations. Recommendations of family members or friends are among the strongest impulses governing purchasing activities. (Kot, 2015) Thanks to recommendations we can clearly see what people like and recommend to others. Another advantage of this revolution is the social filtering. Through bonds and ties recorded in the social graph the content of information can be easily filtered. Social media bring us new possibilities enabling us to create our own online identities and transfer data connected with these identities to any application on the Internet. This is the

end of the anonymous Internet. The way we work and aspects of our daily life will continue to change. (Shih, 2010)

### **Online social networks**

Under the notion online social network Boyd and Ellison (2007) see service that is subject to Internet connection and which gives individuals an opportunity to create their profile within the specific boundaries of a system and view a list of other users who are in contact with them and can thus communicate with each other. By linking such users, we are able to create a social network. Thus, social networks are categorized under the notion of social media. The key factor is mutual interactivity. The best known social networks include Facebook, LinkedIn, Google+ and Twitter. They have one thing in common - they offer space for communication and building relations.

Social networks are largely viewed as a new communication tool rather than a new technology. They are the result of sudden, unexpected, or perhaps even revolutionary changes in communication and not the result of gradual evolutionary process. The strongest factor in their success is their synergistic effect. Thanks to that they can rule over yet unknown forms of communication. Social networks are primarily seen as communication networks and not just as a one-way communication channel. (Riaz, 2015)

Livingstone (2007) and Boyd (2008) emphasize the direction of the development of social networks - from seeking friendships to maintaining the already existing ones. They predict gradual blending of on-line and off-line communication, arguing that the dividing line between these kind of communication is getting thinner because the technology is increasingly incorporated into the daily life of people.

## **2 Research and methodology**

For the purpose of obtaining the necessary primary data we used e-questionnaires, which main task was to find out the views of respondents and their perception of the issue. The questionnaire was distributed online through the multiple channels, where e-mail, call-to-action embedded in blogs, discussion forums belong. Also, the greatest emphasis was put on the use of social networks as one of the elements of social media. The research sample consisted of active users of social media who have an account on at least one of the aforementioned social media, namely Facebook, Twitter, LinkedIn, YouTube, Pinterest, Google+, Instagram, Snapchat, Tumblr. Active use of social media was mandatory requirement. Collection of data was conducted over

a period of three months during the first half of 2016. Subsequently we worked with the sample of 476 valid e-questionnaires.

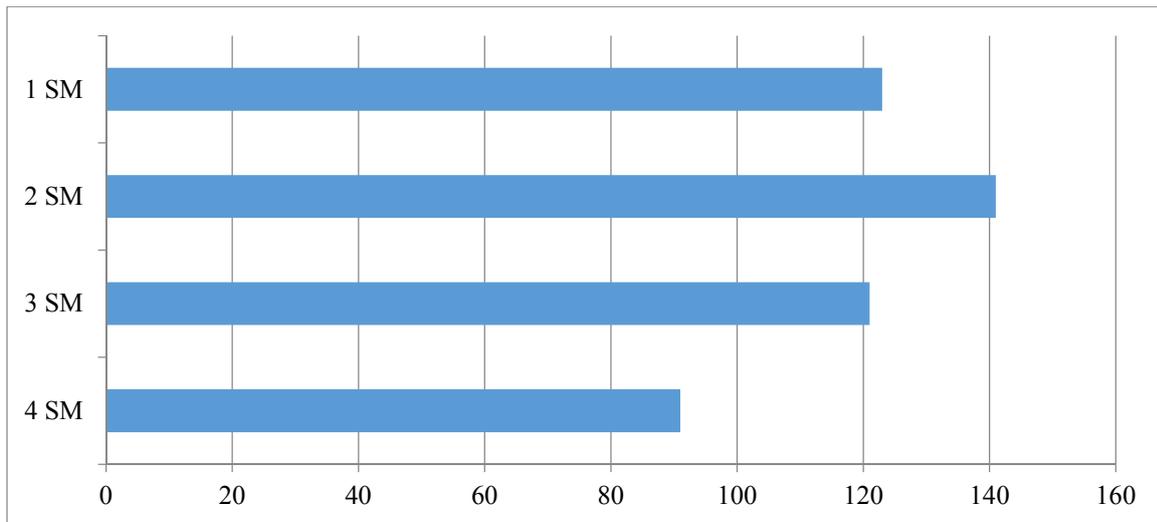
The largest group of respondents were younger than 21 years (23.94 %; N = 114). Slightly smaller group of respondents were the ones aged 28-31 years (22.90 %; N = 109). Next, it was followed by a group of respondents aged 25-27 years (18.28 %; N = 87), and a group of respondents aged 22-24 years (18.07 %; N = 86) and the last group of respondents were 32 and older (16.81 %; N = 80). Gender distribution was almost balanced, with slight majority of women (52,10 %; N = 248), followed by men (47,90 %; N = 228). In the case of education, the greatest group was a group of people with high school education of the second degree (33,82 %; N = 161), followed by secondary school education (32,57 %; N = 155) and high school education of the first degree (26,26 %; N = 125). Other educational groups were represented only by minimum shares. From the perspective of social status, the greatest group consisted of employed people (42,01 %; N = 200), followed by students (41,39 %; N = 197), entrepreneurs (9,88 %; N = 47) and unemployed (6,72 %; N = 32).

The correlation analysis was applied with use of gamma coefficient since our analysis focused on the ordinal data scale data, which does not satisfy the second condition of Kendall's  $\tau$ . This coefficient defines the degree of dependence in the range of -1 to 1, where -1 is a perfect opposite dependency and 1 is a perfect dependency. There are multiple scales regarding the evaluation of approximation. In our research, the dependency ranging between 0.01 and 0.2 is described as weak dependency, the dependency ranging between 0.2 and 0.3 is described as medium dependency and values over 0.3 are described as strong dependence.

### **3 Findings**

In the first phase of our research we focused on the question "how many social media are you registered with". Most respondents said that they have two social media accounts (29.62 %; N = 141), the second biggest group said they have only one social media account (25.84 %; N = 123), followed by a slightly smaller group of respondents with three social media accounts (25.42 %; N = 121). The smallest group of respondents stated they have profiles on four social media (19.12 %; N = 91).

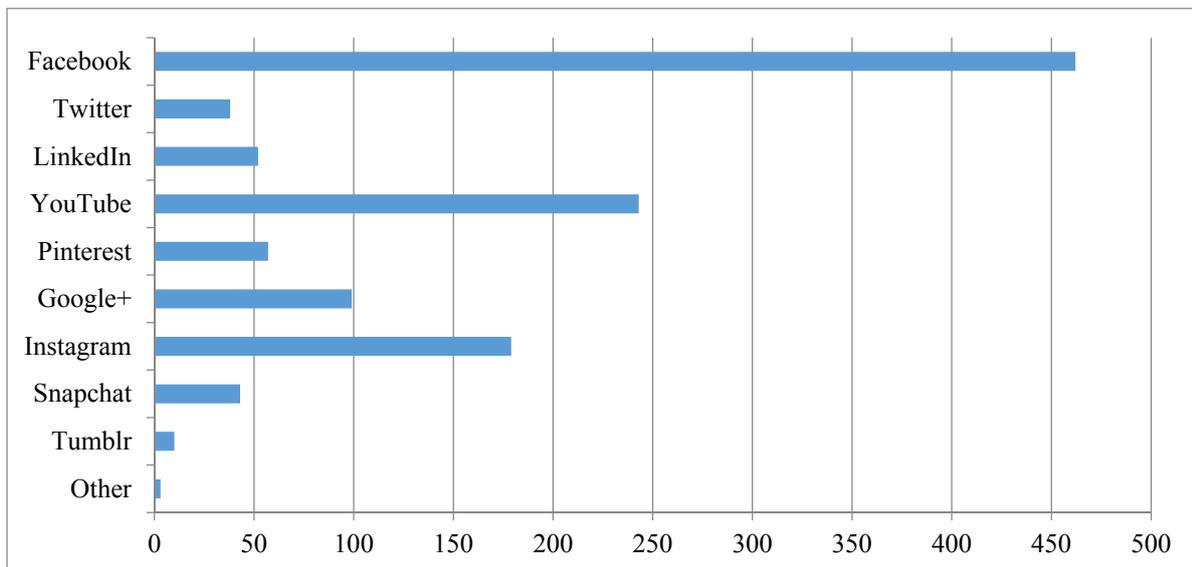
**Fig. 1: How many social media are respondents registered with**



Source: own data processing

A closer look at the specific social media shows that almost all respondents (97.10 %; N = 462) have a Facebook account. The most preferred second option was YouTube (51.10 %; N = 243), the third most popular option was Instagram (37,60 %; N = 179), fourth was Google+ (20.80%, n = 99). All others did not make it above 10 %.

**Fig. 2: Popularity of the selected social media**



Source: own data processing

We also analyzed how the knowledge of the use of social media affects their willingness to subscribe to channels of brands on social media. In order to get results we worked with the

following hypothesis: "There is a statistically significant association between the knowledge of the use of social media and the subscription rate of brands' channels ".

**Tab. 1: Correlation analysis of the knowledge and subscription rate**

	If I see a social media content that attracts me, I subscribe to the channel of the company / brand					Total
	Strongly disagree	Disagree	Do not know	Agree	Strongly agree	
I am an individual user of social media (social networks, blogs, forums,...)	5	2	2	1	1	11
Strongly disagree.	9	8	1	6	0	24
Disagree	11	29	23	58	9	130
Do not know	7	24	29	68	34	162
Agree	6	19	27	59	38	149
Strongly agree.	38	82	82	192	82	476
Total						

**Symmetric Measures**

	Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal Gamma	,313	,050	5,956	,000
N of Valid Cases	476			

a. Not Assuming The Null Hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Source: own data processing

The first column labeled “value” and its first line show the measure of association regarding the relevant questions. The second line shows the number of statistical files. The second column defines the acceptance limit for tests. The second last column shows the value of the test and the final column shows *p* value. The measure of association with the output value of 0.313 can be seen as a strong dependence. Statistically significant degree of association is confirmed by the value  $p = 0$ . Therefore, the subscription rate is strongly influenced by knowledge of the use of social media.

In addition to the previous hypothesis we focused on the question whether the frequency of using social media in this regard plays an important role and whether that is reflected in the subscription rate. In this regard, we have formulated the following hypothesis: "There is a statistically significant association between the frequency of using social media and the subscription rate."

**Tab. 2: Correlation analysis of the frequency of using social media and the subscription rate**

	If I see a social media content that attracts me, I subscribe to the channel of the company / brand					Total	
	Strongly disagree	Disagree	Do not know	Agree	Strongly agree		
I am a frequent and regular user of social media (social networks, blogs, forums,...)	Strongly disagree.	6	1	1	1	0	9
	Disagree	11	7	1	3	1	23
	Do not know	6	9	16	20	5	56
	Agree	8	38	35	94	31	206
	Strongly agree.	7	27	29	74	45	182
Total		38	82	82	192	82	476

**Symmetric Measures**

	Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal Gamma	,320	,055	5,529	,000
N of Valid Cases	476			

a. Not Assuming The Null Hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Source: own data processing

As a result, our analysis showed that the degree of association with the output value of 0.320 can be interpreted as a strong degree of dependence between the frequency of social media use and subscription rate, as confirmed by the value  $p = 0$ .

## Conclusion

The research confirmed that there is a strong relationship between how respondents perceive their knowledge of the use of social media and their willingness to sign up to newsletters from a brand. The better the knowledge of the use of social media, the higher the possibility of subscribing to brands' newsletters. But it is not the only important factor. Also another factor has shown to have a strong degree of influence on the willingness of user to sign up for newsletters - the frequency of use of social media. Our logical assumption was also confirmed statistically. The more time people spend on social media, the more likely they are to sign up to a newsletter. Having an account on social media does not mean that a user will automatically search for and sign up for a newsletter. Regular use of social networks makes users more

independent. It follows that independent users are more likely to sign up for a newsletter on social media. This idea was perfectly summed up by David Meerman Scott: “You can buy attention (advertising). You can beg for attention from the media (PR). You can bag people one at a time to get attention (sales). Or you can earn attention by creating something interesting and valuable and then publishing it online for free.” A good understanding of social media and the ability to influence people in the will become increasingly important issue for brand managers. Without these skills it will be difficult to succeed. We dare to say that this field still has a lot of unexplored areas that should be the subject of future research.

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## SUPPORT OF INNOVATION ACTIVITY OF SME AS A FACTOR OF COMPETITIVENESS GROWTH OF SLOVAK REPUBLIC

Irina Bondareva – Jana Plchová

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### Abstract

**Purpose:** The main objective of the paper is to evaluate the effectiveness of selected instruments of financial support for innovative SME SR by the state in the years 2014 - 2016 and to propose measures for their streamlining.

**Design / methodology / approach:** The qualitative part of the research was done by the method of controlled interview on a sample of 20 innovative SME. For secondary analysis were used the data of the Ministry of Economy SR, Slovak Business Agency, Slovak Innovation and Energy Agency, World Economic Forum, Global Entrepreneurship Monitor, European Commission and other sources. During the processing of information, we have used general methods of scientific work and standard statistical methods, which allow us to meet the objectives of research.

**Findings:** The results of the investigation indicate the reasons of SME SR low innovation activity, as well as the causes of SME low interest to use the examined financial instruments of innovativeness support from the state.

**Research / practical implications:** The low efficiency of the examined forms of financial support of SME innovation from the state is identified, which is due to low awareness especially of start-up SME, the small volume of selected funds that only partially cover the real costs of SME for the development of innovation. The problem is also the inefficient distraction of funds selected for this purpose and the absence of feedback on the effectiveness of their use.

**Originality / value:** The paper evaluates the effectiveness of selected instruments of financial support of innovative small and medium-sized enterprises by the state and includes proposals of measures for their streamlining.

**Keywords:** innovation activities, support instruments, small – medium enterprise, Global Competitiveness Index

**JEL Codes:** O11, O47

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## **Introduction**

According to the World Economic Forum (2008-2016) evaluation, the Slovak economy is in the third stage of development, the effectiveness of which is assessed by development and exploitation of knowledge. To the foreground become industries and companies the activities of which are based on the use of the results of fundamental science, information and knowledge. Small and medium businesses become a natural environment for the development of innovative processes.

The important pillar of the Slovak economy is small and medium-sized enterprises (SME). According to data of the Slovak Business Agency (2016), SME create more than 99% share of the total number of businesses in Slovakia, in the business economy they create 70.7% of work places and they take part in 61.2% of added value creation, which greatly exceeds corresponding EU average (European Commission, 2015). The increase of their innovative activity thus directly relates to ensuring the growth of competitiveness of Slovakia. The growth of Slovak Republic competitiveness is crucially linked to the competitiveness of domestic companies in internal and especially in foreign markets. Internationally active SMEs create higher turnover, create more jobs and support more innovations (Kajanová, 2014).

The main objective of this paper is by using the results of own research to evaluate the effectiveness of selected instruments of financial support of innovative SME in Slovakia from the state in the period 2014 - 2016 and to propose measures to make them more efficient. The partial aim is to map the current status of SME in Slovakia in terms of innovation and to highlight the main systemic problems that prevent its development.

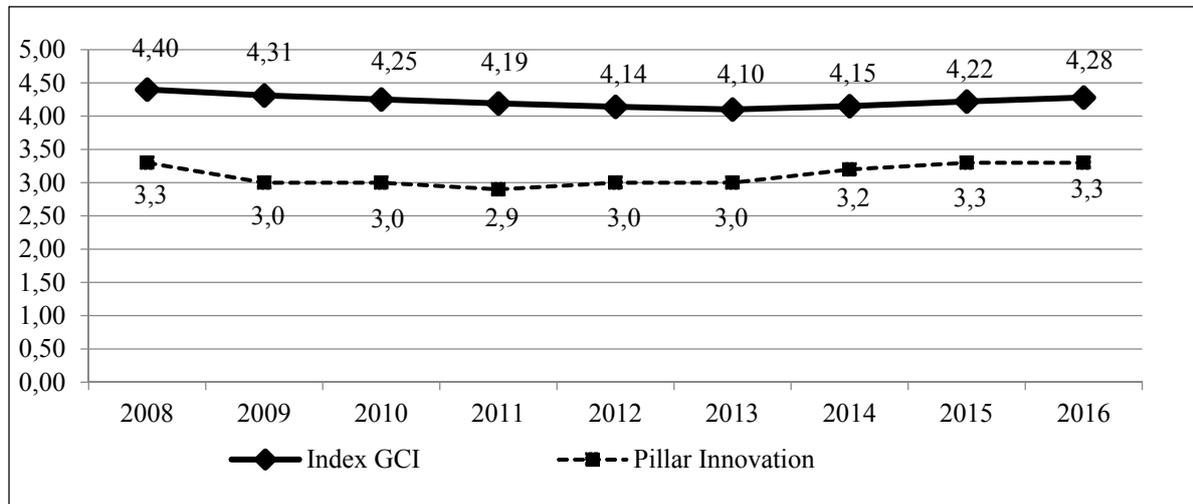
### **1 Analysis of the position of Slovakia in terms of innovation**

For the initial assessment of the state of SME innovations in Slovakia were used data of renowned international and domestic institutions which deal with this problem for a long time. According to the methodology of the World Economic Forum (2008 – 2016) is the competitiveness of economy assessed by the Global Competitiveness Index (GCI). The index is based on 12 pillars of competitiveness and it provides a comprehensive picture of the competitive environment in countries of the world at all stages of development. Especially the pillar of innovativeness is crucial for Slovakia due to its phase of development of economy.

Comparison of the development of a complex GCI index with a value of Innovation pillar in the years 2008 - 2016 (Fig. 1) shows the same trends in their development, which

confirms the crucial role of the growth of innovation activity of companies in the growth of competitiveness of Slovakia.

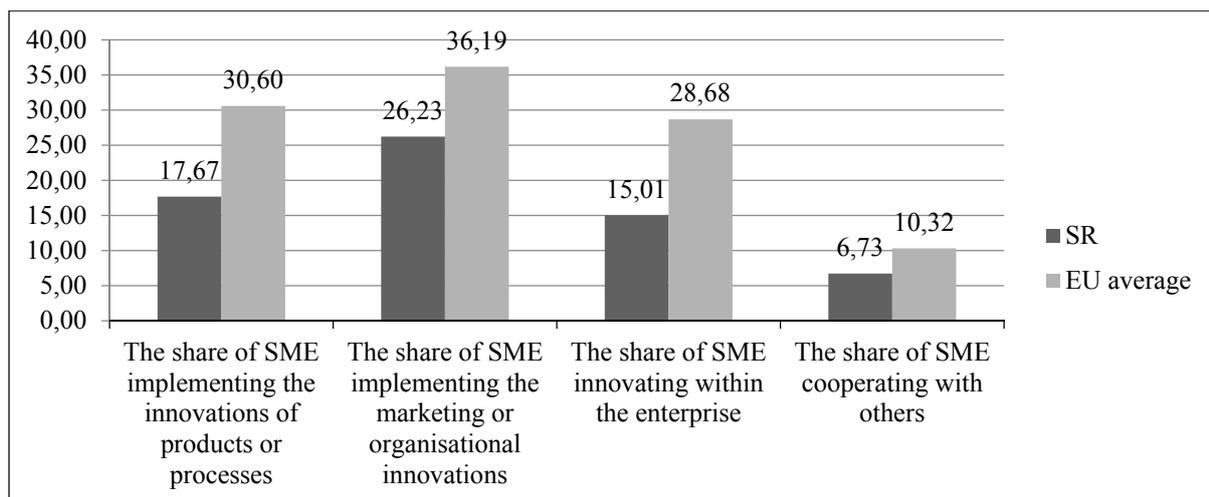
**Fig. 1: Tendency of the GCI Index development and the pillar "Innovation" of Slovakia**



Source: own processing by the authors on the basis of data World Economic Forum, 2008 – 2016

Data of SME innovation activity, regularly compiled by the European Commission (2015). They enable to compare the innovativeness of Slovak SME to the average of EU countries (Fig. 2).

**Fig. 2: Comparison of Slovak SME efficiency with EU in the field of innovations**



Source: European Commission, 2015

This comparison gives clear information of Slovak SME lagging behind the average of the European countries in all areas assessed.

The data published by Slovak Business Agency (2016) enable to assess the proportion of Slovak SME in strategic sectors that are currently drivers of the economic growth (Tab. 1).

**Tab. 1: Representation of the Slovak SME in high-tech sectors in the year 2016**

Indicators	Value
The share of SME in high-tech sectors in the total number of SME in industry and services	4,3 %
The share of SME (entrepreneurs and legal entities) in the manufacturing sector with high technological level	1,38 %
The share of SME (entrepreneurs and legal entities) in service sectors with high technological level	5,17 %

Source: Slovak Business Agency, 2016

These data show that only 4.3% of Slovak SME works in innovative sectors with high added value. The technological level of Slovak SME is also low, which does not contribute to the growth of their innovation activity.

The results of international research Global Entrepreneurship Monitor (2016) to the overall decline in business activity in Slovakia and one of the reasons referred to the lack of equity. As practice shows, the Slovak banks distance themselves from funding of innovation activities of SME in relation to their high-risk. It can therefore be concluded that one of the important causes of lower innovation activity of Slovak SME is ongoing lack of capital. Šúbertová and Markovičová (2015) argue that the big problem for all companies is to finance their own activities. There are also unavailable or difficult for Slovak SME to access the alternative forms of innovative projects funding, such as venture capital or crowdfunding, due to a lack of insufficient development of these forms of funding in Slovakia. The difficulty is that many small and midsize enterprises lack the capabilities, resources and incentives for innovation (Shapira, n.d.). As a result of unsuccessful attempts to start promoting the use of risk capital from public funds, lack of capital markets and low interest of private investors, the equity financing in Slovakia is still underdeveloped. These conditions, along with other obstacles, create a system of financial barriers to the innovative development of SME in Slovakia.

## **2 Analysis of the effectiveness of selected financial instruments for supporting innovation activities of SME of the Slovakia by the state**

EU Member States try to combine national and EU policies in terms of innovation investment and in terms of catching up on technological progress (Czarnitzki and Lopes Bento, n.d.). In

recent years, Slovakia has adopted several measures to support the growth of innovative activity of SME (Janáková, 2015). Financial support instruments for innovative SME from the Ministry of Economy are two specific instruments for utilisation effectivity of which we decided to focus on. Specifically, there are the innovation vouchers and competition "Innovative Deed of the Year".

Innovation Voucher is a non-repayable grant to fund the development of innovative activities for SME in the form of vouchers that can be used by entrepreneur to pay for the services of dealing with scientific- research project to one of the 54 eligible coworkers of innovative projects. This form of support of SME innovativeness from the state is in Slovakia available since the year 2013.

Competition for the Award of the SR Minister of Economy "Innovative Deed of the Year" takes place since 2007 and aims to highlight interesting innovation activities of Slovak entrepreneurs. The best innovative deeds in individual categories - Product innovation, Technological innovation and Innovation of services are assessed by jury. Top three competition proposals in each category are rewarded by financial reward of 7 000 EUR, 5 000 EUR and 3 000 EUR. The basic data on provided grants via innovative vouchers for SME SR in the years 2013-2015 are stated in table 2.

**Tab. 2: Providing grants via innovative vouchers in the years 2013-2015**

Year	Number of applications submitted for SME	Number of approved applications for SME	Amount of the subsidy in the form of innovation vouchers for SME	The total budget for providing innovation vouchers for SME
2013	22	21	3 500	73 500
2014	105	43	5 000	215 000
2015	86	67	5 000	335 000

Source: Ministry of Economy of the Slovak Republic, 2017

As the above data shows, considering the total number of SME in Slovakia there is relatively small interest in obtaining the innovation voucher. Although the probability of obtaining it is considering gradually increasing the amount of resources allocated relatively high. The number of candidates in the competition "Innovative Deed of the Year" in the years 2010-2015 is presented in table 3.

**Tab. 3: Applications in the competition "Innovative Deed of the Year"**

Year	Product innovation	Technological innovation	Service innovation
2010	18	11	5
2011	10	6	10
2012	17	6	11
2013	13	8	11
2014	15	14	12
2015	10	4	9

Source: Slovak Innovation and Energy Agency, 2017

For this activity of the Ministry of Economy of the Slovak Republic is even more striking the small interest of businesses in participating in this national competition.

### 3 Objective and methodology of research

The objective of our primary research was discovering the causes of low interest of SME in selected forms of financial support for SME innovativeness based on the interpretation of respondents' experience. To meet this goal, we have set the following research questions:

- What causes the low interest of SME in Slovakia in these two state-subsidized instruments of financial support of innovativeness?
- What are the obstacles seen by SME in promoting of SME innovativeness in SR?
- How should the state in terms of respondents help SME in promoting their innovativeness?

The research was conducted during 4 weeks between January and February 2017. A research sample was represented by 20 SME operating in the SR. The research was conducted by In-Depth Interviews with company owners face to face or by phone. An audio recording was made from each interview. The interviews were conducted interactively, according to a unified scenario. The order of the topics as well as the depth of examination of the issue was individual and depended on the experience and insight of individual respondents in the given issue. In general, however, it is possible to state the willingness and interest of respondents to express their opinion and attitude to the examined issue, which is of fundamental concern to them and which affects the results of their entrepreneurial effort. Duration of individual in-depth interviews ranged from 30 to 90 minutes, again depending on the experience of respondents in the area. The longest and the most significant interviews were provided by the most experienced respondents.

The research sample we created from a number of sources in order to include the views of entrepreneurs from several relevant segments representing SME in Slovakia. The first source of contacts to the respondents was the STU University Technological Incubator in Bratislava. The management of incubator informed all incubated companies about the ongoing survey and asked them to cooperate. Five incubated companies responded to this challenge. They formed our first group of respondents. The second source of contacts was created by entrepreneurs already established on the market with whose the authors of survey have a long-term contact on a business or private basis. From this group, we included 6 companies in the research, none of which used the investigated tools of innovation. The third and the fourth group of respondents was created by addressing companies from freely available databases of companies that applied for an investment voucher in 2014 and 2015 or databases of companies that have signed up for the Innovative Deed of the Year in 2014 and 2015. In the third group, we have included SME that asked for vouchers in the year 2014 or in the year 2015. Some of these companies repeatedly awarded a voucher in both examined periods. We also addressed companies that were unsuccessful in the year 2014 and successful in the year 2015. Only one respondent was in the last group, because according to the available databases in the examined period there was only one company in Slovakia that successfully used simultaneously both examined tools of innovation support.

The data obtained by transcribing the texts of recorded interviews were analyzed and interpreted in order to find answers to research questions and to propose further recommendations for decision-making on the examined subject.

## **4 Results and discussion**

The most important research findings are divided according the examined groups.

### **4.1 Starting small businesses incubated under University Technology Incubator of STU in Bratislava**

For interviews with start-ups, small incubated companies, their lack of information about the existence and the possibility of using the examined instruments of financial support by the state were indicative. Directed interview in these cases has become for companies a way how to get this information. Based on the responses of the owners of these companies, it can be concluded that they were pleasantly surprised by the information on the possibility of such financial support from the state and all such companies declared their interest in applying for these funds

in the case of the next call. All these companies considered the amount that can be earned by this way to fund innovative business activities as motivating.

In one case, the owners of the incubated company knew about the existence of innovative vouchers. The information they got randomly when working on the Internet. However, they did not use this opportunity, due to the short time to the end of the call and according to them the disproportionate administrative burden associated with the application.

The companies of this group did not have information about the existence and possibilities of usage of examined instruments of financial support from the state. All such companies have declared their interest to apply for this funding in case of the next announced call as they consider the amount which may be received to finance their innovation activities of firms as motivating.

These companies identified as the biggest problem, they perceive, a disproportionate administrative burden associated with the performance of all obligations of the company to the state. The administrative burden deprives them of the amount of time and energy that could be given to the real work on the development of their business project. All these companies also expressed the opinion that they would welcome portal statement summarizing all necessary and useful information on a variety of opportunities for supporting SMEs in Slovakia. They argue that this function could take over the State which should organisationally as well as financially roof such activity. Particularly was highlighted the lack of transparency of website of SR Ministry of Economy.

#### **4.2 Innovative SME established on the market, not using the mentioned instruments, despite the fact that they know about this form of financial support from the state**

Established SME with a lot of employees and innovative products were stated during discussions, that the value of 5 000,- EUR voucher creates only a fraction (about 5-10%) of actual costs incurred in connection with the preparation of innovation and the costs associated with the administration when applying are ineffective for them considering the potential benefit. The similar was their perception of the amount of remuneration for participation in the competition "Innovative Deed of the Year".

The opinion appeared, that in the Slovak business environment is an excess of various competitions for SME which are independently organized by various associations to promote entrepreneurship and that it would be preferable for the state to support financially and organizationally some already established competition and not create another. The biggest obstacle to the development of innovation in Slovakia is considered by representatives of this

group of companies the huge administration and the poor quality of the business environment particularly in the area of law enforcement, corruption and clientelism - which corresponds with the results of GEM (2016).

#### **4.3 SME which applied for innovation voucher in the period 2014 and 2015**

Representatives of most of these companies declared that they learned about the possibility of innovation financing by innovation voucher from operatives of science and research environment with whom they have entered into cooperation and who directly noticed this possibility. In many cases, they also helped them to fill out the necessary documentation in order to meet the requirements of reviewers of the selection committee. Some companies pointed to the inability of officials deciding on allocation of state subsidies to objectively assess the real potential of innovation.

Representatives of these companies, do not consider the amount of innovation voucher sufficient, but they often use the opportunity to apply for a voucher for the same innovation in the coming period, whereby the amount applicable to the development of these innovations have multiplied. With one exception, none of the companies in the group knew about the possibility of register their innovative product, process or service for the competition "Innovative Deed of the Year". They considered this information interesting although the amount of financial compensation they did not consider particularly motivating they appreciated the potential opportunity to promote their business and their product due to the success in this competition.

In terms of assesment the barriers to innovation, the representatives of these companies pointed out to major systemic weaknesses in the business environment in Slovakia. These weaknesses reduce the efficiency of their operations. They pointed out that in Slovakia is very high SME innovation potential but the environment that should assist them, on the contrary creates obstacles. In case of some innovative products, e.g. in the field of education, the companies would appreciate the creation of a social order by the state to help them establish themselves in the market.

#### **4.4 SME using innovate vouchers and at the same time they were awarded in the competition "Innovative Deed of the Year"**

We found only one company in the entire database of SME in SR that during the monitored period used both examined financial instruments. The experience of this company with the usage of monitored tools, as well as its perspective on solving problems of the business

environment in Slovakia was more complex and sophisticated. Both examined instruments are considered by the company as an effective tool to support innovation. Innovation vouchers are considered the ideal means for creation of the first contact of companies and research institutes, under which then formed a long-term mutually beneficial cooperation. The opportunity to participate in the competition "Innovative Deed of the Year" is considered as an effective way to present the results of their work. From the perspective of this company, however such support of innovativeness is inadequate as it fails to balance the challenges and obstacles that the business environment in Slovakia SME create.

In addition to the high administrative burden and bad law enforcement, this company considers also the ineffective system of its support as a significant obstacle to the innovation of SME in Slovakia. According to this company, the state should monitor the effectiveness of spending these funds by collecting feedback from the companies which used voucher. Similarly, it would be appropriate to review the current flat-panel voucher system and focus it on areas that are the key to the economy of Slovakia. In the current situation, it is easier for the company to find support for its own innovations abroad than in the Slovak business environment.

## **Conclusion**

In accordance with the objectives of our survey, based on the evaluation of the respondents' opinions from individual groups, we state the following:

1.) Low interest in signing up the competition Innovative Deed of the Year is unambiguously caused by the poor awareness of the business community about this activity of the Ministry of Economy of the Slovak Republic. Involvement in the competition is not administratively demanding, and due to low interest (see Table 4), the subscribed companies have a fairly high chance of success in the competition. The success in this competition is additionally associated with the promotion of the company and their innovations in the national media, so in essence, all the companies we have addressed in the survey and have presented them this tool, have shown interest in this activity.

In the case of the second tool investigated by us - innovative voucher, there are two reasons of relatively low interest in its use. The first reason for this is the low awareness rate, which is particularly evident in small start-up companies (group 1) who do not know about the possibility of using such financial support of innovation from the state.

The second reason that was typical for already established companies (Group 2) is that they consider the level of financial support by the state as very low and because of some administrative complexity of the whole process as ineffective. They point out, that the amount of the investment voucher represents only a fraction of the real volume of finances needed to real launch of technological innovation into practice.

On the other hand, many companies in Group 3 and 4 increase the amount of the voucher by repeatedly submitting application to subsidize the research of the same evolving innovative idea. For these companies, the innovation voucher is often not only a form of innovation funding, but many also see it as a way to establish long-term cooperation between innovative businesses and the science and research sphere. Due to the overall number of SME in Slovakia, is such approach still rare. (See Table 3).

Different approaches to understanding the innovation voucher (Group 2 versus Groups 3 and 4) also depend on the personality of the particular entrepreneur and are also related to its value setting and ability to search for opportunities in the business environment and to exploit overcoming obstacles to growth and empowerment of the company.

2.) The second area of research involved defining the most significant barriers that, from the point of view of respondents, impede the development of their innovativeness. All respondents point to many unnecessary obstacles that the business environment creates them in Slovakia. Respondents have repeatedly pointed to unnecessarily high administrative burdens that, takes lot of time and energy especially from small start-ups, that they would like to devote to their business. Experienced entrepreneurs particularly point to corruption, poor law enforcement, a high payout burden, but also a poorly-tailored education system that does not prepare school graduates in terms of practice needs. Companies with highly innovative products in the European and world level do not feel sufficient support from the state and conditions are not created equally. Several of them deal with this situation by cooperation with companies' abroad (Austria, Germany). In that environment, they feel much more support and appreciation of the uniqueness of their ideas are they valued functional system that streamlines and accelerates the introduction of these innovations into practice. Not negligible is of course the difference in financial reward of their activities.

3.) The third area of our research was focused on the area of changes in the business environment, which would most significantly help SME. According to the opinion of respondents the current system of awarding innovation vouchers have to be also criticized because of the lack of feedback, namely the recognition of real benefit to the business that used the voucher i.e. the state. SME generally point to high administrative burden from the state

associated, not only with submitting applications for financial grants, but also with all their business activities.

To streamline the entire system of financial support for SME innovation it would be needed to change the whole process of financial support of innovation, from the state. Current, substantially planar and general system of innovation vouchers, we propose to replace or add by goal-oriented system of grants awarded to highly innovative products of strategic importance for the economy of Slovakia. Innovation vouchers would also not have to be a one-off event but on the basis of information on the effective use of the resources provided by the company, the state could establish a system in which it could targeted subsidize the research of promising emerging innovations in successive stages until it is put into reality. In this case, it would be appropriate to assess the amount of the individual vouchers in relation to total estimated costs associated with the research and development of the innovation.

An integral part of the streamlining of the entire system has to be the creation of a supportive, transparent and least administratively challenging environment for SME. The component part of this environment should also be state-sponsored transparent information platform for SME where they can in one place get all the information they can use in their activities, including information on all current challenges and opportunities for promoting their innovative activity by the state but also other entities supporting entrepreneurship.

Slovakia, as a small economy, should set a several strategic business areas in which the companies have demonstrated the ability to reach the European or world leaders. The state should preferably strongly support the companies from these areas with high added value products, which have already passed achievements at international level. By strong support of such companies the state could create an environment in which would be developed culture of social support of the best and most successful.

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## INNOVATIVE ENTREPRENEURSHIP IN POLAND AGAINST EUROPEAN COUNTRIES

Arkadiusz Borowiec

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### Abstract

**Purpose:** The purpose of the article is to address a question regarding the range and extent of innovative entrepreneurship of Polish companies in comparison to other European countries. The article raises a hypothesis according to which innovative activity of Polish companies is being developed in many areas, but on a small scale, which results in an insignificant number of innovative companies. There are numerous Polish publications on innovation and entrepreneurship. However, scientific studies on innovative entrepreneurship in Poland against European countries are rather scarce. The research gap in this area has thus become an inspiration for the preparation of this article.

**Design/methodology/approach:** The data used in the empirical part have been derived from both Eurostat data and own surveys. Own research is complementary and allows its comparison with the secondary sources that underpin the considerations. They were conducted electronically on a representative sample of 455 companies in the second half of 2016. In order to formulate a diagnosis on the scope and level of innovative entrepreneurship of Polish companies this article uses variables in the following areas: innovative activities of enterprises, research and development, investment in innovative activities, sale of new products, cooperation in the field of innovation, objectives of innovative activities.

**Findings:** In Poland, cooperation in the field of innovation, price competition and the lack of extensive research and development activities are all worse than in other European countries. As in Europe, innovative entrepreneurship in Poland is being developed in many areas but usually on a much smaller scale.

Research/practical implications: Polish companies should be more open for their clients and consumers. They should also cooperate more with one another. Research and development activities inside companies also remain equally important. The innovativeness of large companies and their collaboration with smaller entities are crucial for the development of innovative activities.

**Originality/value:** The article describes original research and formulates unique recommendations for economic practice.

**Keywords:** innovative entrepreneurship, innovative activities, barriers to innovative activities

**JEL Codes:** O3, O31, O38

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## Introduction

According to a study conducted by the European Commission, Poland for the past 10 years has been unsuccessful in improving its position in the ranking of the economies of the Community. According to July 2016 data, Poland remains a "moderate innovator" alongside Croatia, Latvia and Lithuania and ranks 22nd out of 28 countries surveyed by the Commission. This position largely owes to lower spending on research and development and worse than average results of Polish scientists in comparison to other countries. Poland, however, holds several advantages over other EU Member States. The most important of these include business expenditure on innovation (Białek-Jaworska, Ziemiński, Zięba, 2016). A decrease in the number of innovative companies has also taken place, which is a pan-European trend.

It should also be emphasized that the activity of enterprises in the search for innovative solutions is, without a doubt, one of the key conditions for the improvement of innovativeness across the entire national economy, affects its competitiveness and determines the development. Its importance is indicated by numerous scientific publications by both Polish and foreign authors. These include papers by Porter, M. (Porter, 1990), Kay, J. (Kay, 1996), Hamel, G. Prahalad, C.K. (Hamel, Prahalad, 1999) and Simon, H. (Simon, 1999), and Poznanska, K. (Poznańska, 1998), Małecka, E. (Małecka, 1998) and Stawasz, E. (Stawasz, 1999).

The development of economy based on knowledge and innovation is one of the priorities of the Europe 2020 strategy (Lubos, Trzaskalska-Stroińska, 2015). Reforms inspired by this strategy, which involve the activation of innovative entrepreneurship, can in the opinion of the World Bank, contribute to GDP growth by 0.1-0.2 percentage point per year.

In order to diagnose the position of Polish enterprises and to address questions concerning the scope and extent of their innovative entrepreneurship against the European Union, this article presents research results in the following areas: innovativeness in business, R & D, investment in innovative activities, sale of new products, cooperation in the field of innovation and innovative business objectives<sup>1</sup>. The data used in the empirical part have been derived from both Eurostat data covering the years between 2010 and 2012 and own surveys. Own research is complementary and allows its comparison with the secondary sources that underpin the considerations.

The own research was conducted on a random-quota sample selected from HBI sampling. The proposed sampling in the form of HBI database contains over 176,000 profiles of Polish companies and over 480,000 owners, CEOs, managers, supervisors. Entities were

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<sup>1</sup> Applying a wider range of research is impossible due to the scope of this paper

drawn taking into consideration industry criterion - the main profile of the company. Random sampling was used within the established quota to ensure equal probability of drawing any individual deemed to belong to a certain quota. A total of 1,500 primary test subjects were selected. The final study involved 455 companies. Own research was conducted in the second half of 2016 by electronic means. The questionnaire used questions analogous to the Eurostat survey areas.

The article raises a hypothesis according to which innovative activity of Polish companies is being developed in many areas, but on a small scale, which results in an insignificant number of innovative companies. In this article, innovative activity is understood as conducting scientific, technical, organizational, financial and commercial activities that lead or are intended to lead to the implementation of innovations.

## **1 Nature and types of innovation in the light of literature**

The concept of innovation was introduced in literature by Schumpeter, J. (Schumpeter, 1934) who presented the following 5 kinds: introducing new products, introducing new production methods, creating new markets, developing new sources of supply of raw materials and their products and creating new market structures. His theories of "creative destruction" and the division between "radical" and "incremental" innovations were permanently engraved in a discussion on the innovation process. Contemporary literature defines the concept of innovation in numerous different ways. It is seen through the prism of both micro and macro factors (Matusiak, 2011).

A slightly different understanding of the concept of innovation can be cited after Porter, M.E. (Porter, 1990). According to him, innovation is associated with the exploitation of new ideas, which are expected to carry economic benefits, technological improvements or better methods. Kotler, P. (Kotler, 1994) proposed a similar approach and stated that innovation refers to goods, services or ideas perceived as new, even if they had existed for a long time.

Currently, innovativeness can be understood both as a process of "learning" - acting as a cumulative effect of specific knowledge - and as information useful for enterprises (Matusiak, 2011). In turn, Oslo Manual (OECD definition and Eurostat) indicates that innovation is the implementation of a new or significantly improved product (good or service), a new or significantly improved process, a new marketing method or a new method of organization in terms of business practices, the organization of work space or relationships with the external environment (OECD, 2008).

Oslo Manual distinguishes between the following four types of innovation: **product innovation** involving the introduction of products or services that are new or significantly improved in terms of their features or applications, in terms of their technical specifications, components and materials, software, ease of use, etc.; **process innovation** referring to the implementation of new or significantly improved methods of production or delivery, technology, equipment and/or software; **marketing innovation** or the implementation of a new marketing method involving significant changes in the project/product design or packaging, distribution, promotion and pricing strategy; **organizational innovation** referring to the implementation of a new organizational method of business practices, workplace organization or external relations. Understanding innovation in line with Oslo Manual has prompted the author of this paper to conduct empirical research.

## **2 Studies of innovative activities of Polish enterprises against the European Union countries**

### **2.1 Innovative activities of enterprises**

Large Polish companies rank much higher than SMEs in comparison to European countries that are members of the OECD in terms of the percentage of companies introducing each of the four types of innovations, awarded according to The Oslo Manual. In most cases they introduce process innovations (45.3%), introduce product or organizational innovations at a similar level (38.1% and 38.4% respectively), and the least often - marketing innovations (29.9%). For comparison, only 8.1% of Polish SMEs introduce product innovations, 9.2% implement organizational innovations, 9.5% process and 9.7% marketing innovations<sup>2</sup>.

Assessing the level of innovativeness of Polish enterprises compared to the European countries required a general approach of showing the percentage of companies engaged in ongoing or discontinued innovative activities (in terms of products, processes, marketing methods or organizational methods) against all companies in total. Analyzing the results of Eurostat<sup>3</sup>, it can be concluded that Poland remains a poor innovator, as along with Latvia, Bulgaria and Romania, Poland remains in a group where the said percentage in recent years has not exceed 32% (23% in the case of Poland). In comparison to such leaders as Germany (66.9%), Luxembourg (66.1%) and Ireland (58.7%), Poland has ranked very poorly.

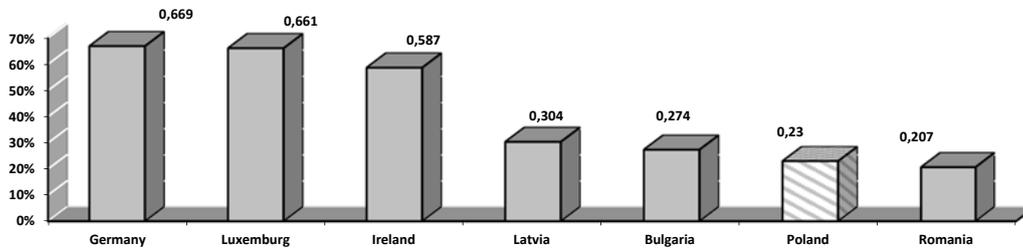
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<sup>2</sup> [http://www.delab.uw.edu.pl/wp-content/uploads/2016/09/DELabUW\\_PRB\\_raport.pdf](http://www.delab.uw.edu.pl/wp-content/uploads/2016/09/DELabUW_PRB_raport.pdf)

<sup>3</sup> The data comes from 2012 (more recent data is unavailable), Eurostat Statistics Database [inn\_cis6\_type], [inn\_cis7\_type], [inn\_cis8\_type].

Figure 1 presents data on the percentage of companies conducting current and discontinued innovative activities in 2012 (countries with the highest and lowest percentage).

**Fig. 1: Percentage of companies engaged in current and discontinued innovative activities in 2012 in selected European countries**



Source: Eurostat Statistics Database [inn\_cis8\_type]

These results have also been confirmed by own studies. Of 455 Polish companies, only 19% declared that they carried or had been carrying some kind of innovative activity.

Analyzing the study results, one should also pay attention to the overall downward trend in the number of innovatively active enterprises in the EU. Despite its leadership position, Germany has experienced the most significant decline in this area.

Against the background of the presented results, the share of companies that do not undertake any innovative activities is worth mentioning. In Poland, it was 77% of the surveyed companies, and in Germany only 33%<sup>4</sup>. Own research further confirms this situation. Over 80% of enterprises in Poland have not undertaken any such activities. However, marked differences between the presented results should be viewed with caution. The level of a given country's development should also be taken into account and compared with countries of a similar level of economic development.

The analysis of Eurostat data also leads to a conclusion that among all the sections classified by PKD<sup>5</sup> (Polish Classification of Activities), the most innovative one in the EU is Information and Communication (in Germany up to 87% of the companies in this section operate innovatively), while Transport and storage section remains the least innovative. The percentage of innovative enterprises in this section in Poland constitutes 14% and the EU average - 33%<sup>6</sup>.

<sup>4</sup> Ibidem.

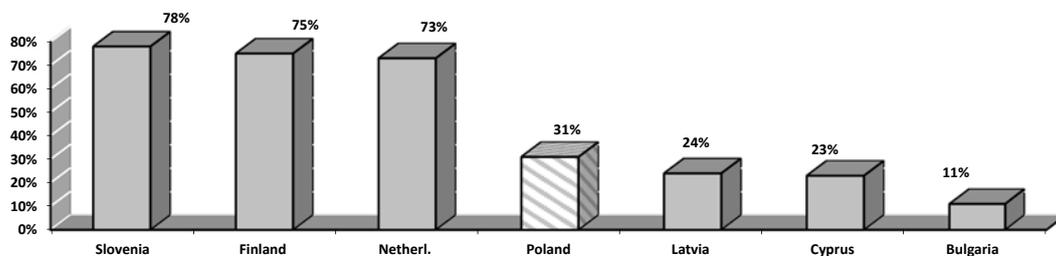
<sup>5</sup> PKD - Polish Classification of Activities

<sup>6</sup> The data comes from 2012 (more recent data is unavailable), Eurostat Statistics Database [inn\_cis6\_type], [inn\_cis7\_type], [inn\_cis8\_type]

## 2.2 Research and development activities

An important role in innovative processes is played by investments in research and development. They facilitate the development of technologies, products and services. One can distinguish between internal<sup>7</sup> and external<sup>8</sup> R&D. Among the innovative companies in Poland only 31% undertake R & D activities, which is one of the lowest results among the EU Member States. Slovenia is leading this classification with a rate of 78%, while in Bulgaria this figure constitutes only 11%<sup>9</sup>. Figure 2 presents countries with the highest and lowest percentage of companies conducting internal R & D.

**Fig. 2: The percentage of companies conducting internal R & D in the total number of innovative companies in 2012**



Source: Eurostat Statistics Database [inn\_cis8\_exp]

Eurostat results are reflected in the analysis of own research, according to which only 25% of Polish enterprises undertake internal R & D activities. The situation regarding external R&D activities appears to be even worse. In Poland only about 20% of companies undertake it, while Finland remains the leader with 52%. The lowest share of innovative companies conducting external R&D activities is present in Malta (5%) and Romania (3%)<sup>10</sup>.

Figure 3 presents with the highest and the lowest percentage of companies conducting external R&D.

Eurostat results are consistent with the results of own studies regarding Poland. Among 455 studied entities only 21% conduct external R & D activities.

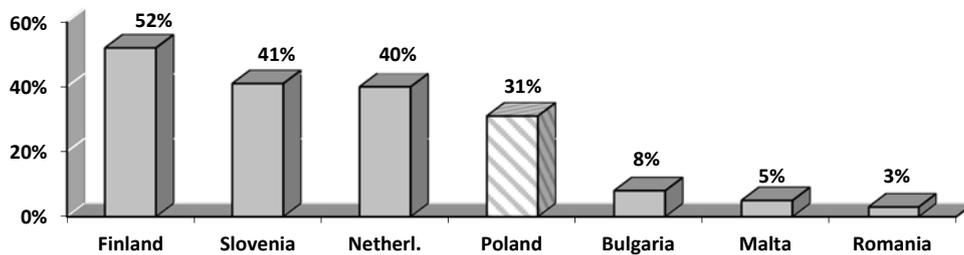
<sup>7</sup> It covers all R & D activities implemented within an enterprise

<sup>8</sup> It includes the acquisition of R & D services available on the market

<sup>9</sup> Eurostat Statistics Database [inn\_cis8\_exp] Innovation activities and expenditures in 2012

<sup>10</sup> Ibidem.

**Fig. 3: The percentage of companies conducting external R & D in the total number of innovative companies in 2012**



Source: Eurostat Statistics Database [inn\_cis8\_exp]

Data on a group of large companies is also interesting. They primarily invest in the development of internal R & D activities. In Finland (92%) and Slovenia (89%) almost every company undertakes internal R & D activities. In comparison to their smaller counterparts, large Polish companies represent a much higher proportion - 46%, although this is one of the five lowest results among the EU countries<sup>11</sup>. Our own results also confirm this thesis, as the share of large companies engaged in such activities amounts to 44%.

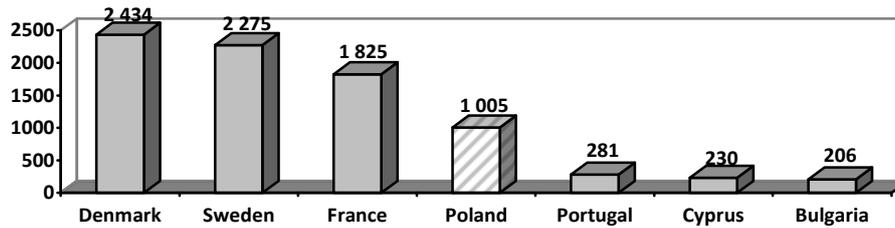
### 2.3 Expenditures on innovative activities

Innovative activities are very often associated with high expenditures associated with new technologies, buying knowledge or external support. According to Eurostat, Denmark is the country devoting most resources to innovation on a scale of one company. This expenditure exceeds EUR 2.4 million. Polish entrepreneurs spend a similar amount on innovative activities, although slightly less than the EU average (28) - EUR 1,005 thousand. The position of Polish enterprises compared to other countries in the group of small (19th of 28), medium (14th of 28) and large companies (17th of 28) is pretty average<sup>12</sup>. Figure 4 presents countries of the highest and the lowest investment expenditure.

The analysis of data on investment in innovative activities juxtaposed with the participation of innovative companies, shows that innovativeness in Poland should be approached through the prism of small but well invested companies. Among the countries presented this situation constitutes some kind of a sensation. It is not present anywhere else.

<sup>11</sup> Eurostat Statistics Database [inn\_cis8\_exp].

<sup>12</sup> Eurostat Statistics Database [inn\_cis8\_exp], [inn\_cis7\_exp].

**Fig. 4: Total expenditure per one enterprise conducting innovative activities in 2012**


Source: Eurostat Statistics Database [inn\_cis8\_exp], [inn\_cis7\_exp].

Due to the difficulty in comparing Eurostat data with the results of own research, the presented data was confronted with statistics from the Central Statistical Office. The latest results of the Central Statistical Office indicate that the expenditure on industrial enterprises in Poland in 2013 amounted to PLN 21 billion, 2014 - PLN 24.5 billion, and in 2015 - PLN 31 billion. While in the sector of service providers it amounted to - PLN 12 billion in 2013, PLN 13 billion in 2014, and PLN 12.6 billion in 2015 (CSO, 2016). Generally, it is therefore possible to conclude that expenditures on innovative activities per one company have been growing moderately.

## 2.4 Selling new products

According to Eurostat, Denmark is the leader in selling products **for companies** with its EUR 30.5 million for an average company selling such innovative products. Spain remains the runner-up with EUR 17.9 million. Enterprises implementing new innovations **for the market** obtain highest amounts from selling these products in Slovakia - EUR 27.5 million and Denmark - EUR 20.9 million<sup>13</sup>.

In Poland, these figures are respectively EUR 7.2 million and EUR 6.5 million – both remaining at a relatively high level. In view of the difficulties related to obtaining financial data from Polish companies, it was impossible to confront the results of Eurostat with surveys conducted among Polish companies.

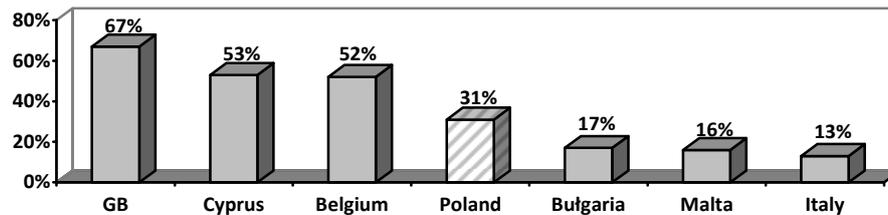
## 2.5 Cooperation in the field of innovation

The cooperation of enterprises regarding innovation seems to be a condition necessary for their very creation. Such cooperation facilitates synergies and the exchange of knowledge in the field of new solutions and technologies.

<sup>13</sup> Eurostat Statistics Database [inn\_cis8\_prod].

According to Eurostat, the United Kingdom remains the EU leader in terms of the level of cooperation between business entities (67%). The greatest work has been accomplished with national operators. Figure 5 presents countries where enterprises cooperated with other entities in 2012 to the lowest and the highest extent.

**Fig. 5: Enterprises cooperating with other entities in 2012.**



Source: Eurostat Statistics Database [inn\_cis8\_].

In the case of less developed countries, such as Poland, it is important to develop an ability to recognize market and cooperation with market participants as the basic knowledge necessary to compete with other companies. Research on innovation enterprises for the period 2011-2013 (CSO, 2015) indicates that in Poland, 28.4% of innovatively active industrial enterprises cooperated with other entities in the field of innovative activity and this result is 5.4% lower than for the years 2010-2012. There was a limited, 23% cooperation in the service sector in 2011-2013 (down by 4.3%).

Own research carried out on innovatively active enterprises has shown that on average about 25% of these entities cooperated with others. However, Polish companies demonstrate an evident weakness in the field of cooperation with universities (only 2% of companies).

## 2.6 Goals of innovative activity

Enterprises analyzed by Eurostat pointed to a variety of targets related to innovative activities. The most frequently mentioned ones included the following: to reduce costs, to increase market share, to increase margins and revenue growth.

Hungary is a country in which the strategy of cost reduction is most often indicated by innovative companies (79.8%). Romania remains the least concerned about costs (4.4%). In Poland, 55% of business entities declare cost reduction. The market share growth strategy is most popular among innovative companies located in Cyprus. Once again Romania ranks the last with 3% of entities declaring this kind of solution. Eurostat data shows that in Poland the strategy of growth in market share was accepted by 47.1% of entities. The other two

classifications (increase in margins and sales) are again dominated by Hungary (83.1% and 86.5% respectively). And again, Romanian companies are the weakest in this regard (5.4% and 0.9%). In Poland, the growth of margin is declared by 33% of companies and the increase in sales by 66.5% of entities<sup>14</sup>.

Results similar to those of Eurostat were obtained on the basis of own research regarding the main goals of innovative enterprises. The objective to increase sales revenue was declared by most respondents - 75% of innovatively active entities. Cost reduction was declared by almost 60% of companies. For less than half (42%) the increase in market share remains important, while only 23% are in favor of an increase in margins.

## **Conclusion**

The hypothesis presented at the outset of the study has been positively verified as a result of the research conducted. The analysis of data published by Eurostat, CSO and derived from own research leads to a conclusion that different European Union Member States are characterized by a large variety of approaches to issues related to innovative activities. Unfortunately, Poland does not present itself exemplary here either. Innovative activities of Polish companies are being developed in multiple areas on a small scale, which results in a small number of innovative companies.

The analysis of data leads to the assumption that recent years have demonstrated a significant outflow of innovative activities from Polish enterprises at the expense of increasing investment in innovative activities for a single company. The research also reveals major barriers related to innovative entrepreneurship in Poland. They include price competition, the lack of broader research and development activities and poor co-operation in the field of innovation. Poland, however, has potential to present the innovative activities of companies in a better light.

Polish companies should be more open for their clients and consumers. Research and development activities inside companies also remain equally important. The innovativeness of large companies and their collaboration with smaller entities are crucial for the development of innovative activities. Poland should also increase its percentage of GDP devoted to R & D.

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<sup>14</sup> Eurostat Statistics Database [inn\_cis8\_obj].

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## THE IMPACT OF THE PRESENCE OF A CODE OF ETHICS ON THE ECONOMIC PROSPERITY OF A COMPANY

Zdeněk Caha – Marek Vokoun

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### Abstract

**Purpose:** The number of companies that are introducing ethical management continues to grow globally, including the Czech Republic. A code of ethics is a tool for determining the infrastructure of a company, as well as manages it. Expert opinions on the possible economic impact of ethical management differ considerably. The aim of this contribution is to prove the possible relationship between the presence of a code of ethics in a company and its economic prosperity.

**Design/methodology/approach:** A sample set of companies was selected in cooperation with the Czech Statistical Office. The data was collected on the basis of a questionnaire. In total questionnaires were sent to 710 targeted companies selected from random industries. In total, 297 responses were received, which is equivalent to a response rate of 41.83%. The purpose was to verify the hypothesis that the presence of a code of ethics in a company has no influence on its economic prosperity. The differences were evaluated using the standard, unpaired, two-tailed Chi-square test of relative frequency differences. We used R statistical software.

**Findings:** Statistical analysis of the results attained in the questionnaire survey show that the presence of a code of ethics, or a lack thereof, has no demonstrable impact on the economic results of a company regardless of its size.

**Research/practical implications:** Even though the results of the research show that the existence of a code of ethics has no demonstrable impact on the economic results of a company, this has not discouraged or hindered the increasing trend for companies to introduce ethical management, which reflects the positive impact companies believe it brings to their company culture and public image.

**Originality/value:** The conducted research is unique and involves a relatively large sample set which introduces new findings to the field of ethical company management.

**Keywords:** Ethical management, code of ethics, economic impact, prosperity, company

**JEL Codes:** M00, M14

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## **Introduction**

The goal of this paper is to determine the relationship between the presence of a code of ethics in Czech companies and their positive economic results for the last five years and to determine how widespread the presence of a code of ethics is. Codes of ethics form a systemic framework for a company's ethical infrastructure and for the application of an integrated system of ethical management (Seknička and Putnová, 2016). The term "code of ethics" (code of conduct) is understood to be a clearly elaborated set of standards and regulations that defines and modifies relations between members of a certain community (Rolný, 2007).

A code of ethics defines in detail the moral principles of a company and their application to company practice. The purpose of a code of ethics and similar documents is to cultivate a particular company environment and culture. According to Remišová (2011), a code of ethics should not be perceived as a legal document and should be comprehensible, communicable, specific, up-to-date and enforceable.

According to Ho (2010), a code of ethics only has a positive influence on the ethical behaviour of employees if it is presented in the right and appropriate way. Singh (2011), for example, recommends that codes of ethics should be evaluated and revised every two years, whereby all company employees should be informed of any changes during a training session. New employees should also be familiarized with the code of ethics, namely prior to the commencement of their employment.

Codes of ethics are also subject to criticism. Their poor efficacy, poor enforceability, formalism and high level of generality are particularly reproached, as is the fact that the behaviour of individuals is more or less determined by the values they acquire during childhood (Putnová and Seknička, 2007). The question as to what extent a code of ethics is useful for small companies and small entrepreneurs with a fixed organizational culture that works mainly on the basis of informal relations, is also disputable (Čaník and Čaníková, 2006).

A code of ethics is also not necessarily accompanied by an improvement in company ethics. Several empirical studies have revealed that codes of ethics give companies a negligible advantage, if any advantage at all. Research conducted by McKendall, DeMarr and Jones-Rikkens (2002) is an example of one of these studies. In their research, Kaptein and Schwartz (2007) also concluded that the efficacy of codes of ethics was relatively low.

A global survey conducted by KPMG (2008) points to the worldwide trend for increasing numbers of companies to define and implement a code of ethics. The research showed that in 2008 the proportion of companies with a code of ethics stood at 86%. It is clear

from the above that in recent years a code of ethics has become a standard basic tool for ethics programs within large and renowned companies. This is also backed up by an informal survey conducted by IBE in 2012, which showed that a code of ethics was implemented by 92% of those companies with the highest market capitalization based in Great Britain whose shares are traded on the London Stock Exchange (IBE, 2012). The IBE survey (2012) also reported that in 2012, 73% of all companies had a code of ethics. In 2016, according to a worldwide survey conducted by PwC, the largest of its kind, in which 6,337 companies from 115 countries participated (including 79 prominent companies from the Czech Republic), on average 82% of companies had a formally established code of ethics (PricewaterhouseCoopers, 2016).

One of the latest surveys was conducted in 2016 by Dow Jones and Metricstream (2016) and showed that 96% of the 330 questioned companies had a code of ethics. The aforementioned surveys indicate the growing trend towards the introduction of codes of ethics in business practice. However, it is important to highlight that not all these surveys are compatible. In actuality, the results depend on numerous factors, in particular on the structure of the respondents. Whilst a higher proportion of large US based companies have codes of ethics, this proportion is smaller for small and medium-sized companies and companies operating in Asia. It is clear that only global surveys with large numbers of respondents from all business sectors and companies of different sizes will therefore provide the relevant information required. Unfortunately, such surveys are difficult to carry out.

According to a survey conducted by the Association of Chartered Certified Accountants (ACCA), one in five managers or accountants in the Czech Republic has had to deal with a serious ethical dilemma in their work. This only confirms the necessity of introducing effective ethical management tools (Transparency International – Czech Republic, 2015.). Džbánková (2003) concluded, on the basis of her smaller less representative survey conducted in 2002, in which 60 representatives participated from middle and top management in companies operating in Prague and Central Bohemia, that 35% of the questioned companies had a code of ethics in place and 22% were considering drafting and implementing one. In contrast, Transparency International – Czech Republic in conjunction with the Economic University in Prague, conducted a very representative survey in 2005, which was repeated in 2006. The surveys sought to determine the degree to which codes of ethics were applied in companies that operated on the Czech market. The conclusion was that in the second half of 2005 only 59 companies (i.e. 10.3%) of the 574 questioned had a code of ethics in place. This situation was similar when the survey was repeated in the first half of 2006, whereby only 104 companies (i.e. 8.4%) of the 1,240 in the sample set had a code of ethics in place. The survey also proved that the larger

the company the greater the chance a code of ethics existed. Dytrt et al. (2011) state that in 2011, less than 15% of domestic companies had a code of ethics in place. In a more recent survey conducted by Transparency International in 2013, the results showed that this percentage had increased to 46% of domestic companies. In the Czech Republic, the presence of a code of ethics tends to be limited to larger companies and public institutions. Smaller companies are still only exploring their options with regards to this ethical management tool.

## 1 Data

Quantitative research was conducted on the basis of a larger questionnaire survey which was conducted between June 2016 and August 2016. The companies were selected in compliance with the EU nomenclature. The aim of the survey was to obtain a statistically representative cross-sectional data set on small, medium-sized and large companies. The data was collected on the basis of an electronic questionnaire. In total questionnaires were sent/given to 710 targeted companies selected from random industries. In total, 297 responses were received, which is equivalent to a response rate of 41.83%. The financial data were found through a questionnaire and subsequently verified in economic database “Albertina”. The initial survey was subsequently followed up with a second electronic questionnaire, the results of which are not included in this paper due to ongoing data processing. The second data set will be used to analyze companies in more detail at a later date.

The representativeness of the data is limited because the analysis only focuses on three categories of company size (see Table 1). The differences between the categories of company size are evaluated using the standard, unpaired, two-tailed statistical Chi-square test of relative frequency differences. We used R statistical software for the relationship tests and the calculation of the interval estimates. All the statistical tests and calculations of interval estimates were performed at a confidence level of 95% (i.e. at a significance level of 0.05).

**Tab. 1: Absolute numbers and relative frequencies according to company size**

Company size	Number	Frequency in %
Small/micro companies	110	37.0%
Medium-sized companies	103	34.7%
Large companies	84	28.3%
<b>Total</b>	<b>297</b>	<b>100.0%</b>

Source: authors

However, there is a potential systemic and confounding bias in the design of the survey because the outcome of the categorical variable is self-evaluated. Another issue is the overrepresentation of active companies because failing companies are less likely and willing to provide true information. In response to this, further research will be conducted into the financial situation of companies. In this way, more precise differences between various categories of companies can be analyzed.

For the analysis, three categories of companies were identified, namely large companies ( $\geq 250$  employees), medium-sized companies (50 – 249 employees), and small and micro companies ( $< 50$  employees). The purpose of the analysis was to determine the relationship between the presence of a code of ethics in Czech companies and their positive economic results for the last five years and to determine how widespread the presence of a code of ethics is. Within the sample dataset, there were several companies that gave no response to the question “Does your company have a code of ethics?” It was decided to assign the answer “No, we do not miss it” to these cases on the basis of the assumption that omitting to answer the question automatically shows that the company does not have a code of ethics. In addition, our interest was only in whether a company does or does not have a code of ethics. As a result, it was decided, for this analysis, to combine the number of responses for “No, we do not miss it” and “No, we miss it” into one group “No”.

As part of the analysis of the relationship between the existence of a code of ethics and a company’s profit or loss, it was necessary to exclude five companies which failed to declare whether their economic results were positive, balanced or negative. In these cases it was impossible to automatically assign any other option.

## 2 Results of the questionnaire survey and statistical processing

**Tab. 2: The presence of a code of ethics in a company according to company size**

	Does the company have a code of ethics?			
	yes	number/ frequency in %	no	number/ frequency in %
Small/micro companies	15	13.6%	95	86.4%
Medium-sized companies	31	30.1%	72	69.9%
Large companies	54	64.3%	30	35.7%
<b>Total</b>	<b>100</b>	<b>100.0%</b>	<b>197</b>	<b>100.0%</b>

Source: authors

The verification of the hypothesis: “*The existence of a code of ethics has no impact on the economic results of a company*”, was conducted separately for each category of company

size. The proportions for the profitable companies are highlighted in bold in the table. A two-selection test was subsequently carried out on the identity of the two proportions to determine whether the statistical difference in the proportions for profitable companies was dependent on the existence or non-existence of a code of ethics.

**Tab. 3: Code of ethics in large companies and economic results**

Existence of a code of ethics	Economic results			Two-selection test	
	balanced	positive	negative	Z - test	0.8499
yes	0.130	<b>0.796</b>	0.074	p - value	0.3954
no	0.133	<b>0.867</b>	0.000	Interval	(-0.0919; 0.2327)

Source: authors, Note: 84 observations

As the p-value is higher than the significance level of 0.05, the test shows that the difference in the proportion of profitable companies in the group with or without a code of ethics is statistically insignificant. The existence of a code of ethics therefore does not affect the economic results of large companies (Tab. 3).

**Tab. 4: Code of ethics in medium-sized companies and economic results**

Existence of a code of ethics	Economic results			Two-selection test	
	balanced	positive	negative	Z - test	0.2233
yes	0.226	<b>0.742</b>	0.032	p - value	0.8232
no	0.162	<b>0.721</b>	0.118	Interval	(-0.2087; 0.1660)

Source: authors, Note: 99 observations

The p-value is once again higher than the significance level of 0.05. The difference in the proportion of profitable companies in the group with or without a code of ethics is also statistically insignificant. The existence of a code of ethics therefore does not affect the economic results of medium-sized companies either (Tab. 4).

**Tab. 5: Code of ethics in small/micro companies and economic results**

Existence of a code of ethics	Economic results			Two-selection test	
	balanced	positive	negative	Z - test	0.3881
yes	0.267	<b>0.600</b>	0.133	p - value	0.6979
no	0.274	0.652	0.074	Interval	(-0.2131; 0.3184)

Source: authors, Note: 110 observations

In this case the p-value is also higher than the significance level of 0.05. Once again, the difference in the proportion of profitable companies in the group with or without a code of

ethics is statistically insignificant. The existence of a code of ethics therefore does not affect the economic results of small/micro companies either (Tab. 5).

## Conclusion

The statistical tests performed on the basis of the results of the questionnaire survey show that the existence or non-existence of a code of ethics has no demonstrable influence on the economic results of a company, irrespective of their size.

Further research should focus on the differences between groups of companies based on technical efficiency, labour productivity, research and development expenditures, and profitability. Also MANOVA would shed some light on odds of relationship using interactions of economic results, size of the company and existence of code of ethics. Non-financial performance variables like employee's satisfaction should also be taken into consideration. These variables can contribute to the better understanding of the total performance evaluation of ethical culture within companies.

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## **IMPLEMENTING SUSTAINABILITY IN A LARGE MINING COMMUNITY: SUDBURY (CANADA) - FROM CLUSTER TO INNOVATION CENTER**

**Jean-Charles Cachon**

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### **Abstract**

**Purpose:** The paper describes a process that has spanned several decades in transforming what started as a Canadian remote polluted mining and smelting camp into a diversified economy aimed at sustainable management and community goals. Sudbury (Ontario) just gained scientific recognition with a Nobel Prize in Physics for a neutrino observatory located 2 200 metres underground. Previously, the United Nations had recognised the city for having restored the greenery of its devastated landscape through community cooperation. Mining firms were recognised for cooperative efforts between management and labour resulting in improved safety and reduced injuries and fatalities.

**Design/methodology/approach:** This paper is based on multidisciplinary secondary data obtained from previous published and unpublished research as well as industry reports and other data. Comparisons are made with similar regions, such as Antofagasta (Chile).

**Findings:** From 1886 to 1972, Sudbury was heavily polluted by record amounts of sulphur dioxide (more than Norilsk in Russia and over three times more than Marista in Bulgaria). Since 1972, local community labour and scientific leaders' earlier efforts started to produce results. A diversified economy evolved through services (education, health care, retail).

**Research/practical implications:** Data about recent developments in the various disciplines related to sustainability need to be gathered in a systematic way.

**Originality/value:** The paper shows how an urban region of 165,000 with a heavy industrial base has transformed itself from an industrial ecological disaster to a significantly more sustainable community. The process leading to the necessary changes is described as driven by social change initiated by community groups, rather than urbanists and politicians. This paper reports on the positive developments associated with the implementation of economic diversification and sustainability principles in Sudbury since 1972.

**Keywords:** Regional Innovation and Economic Diversification, Environmental Innovation and Rehabilitation, Sustainable Management

**JEL Codes:** Q01, Q53, R11

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## **Introduction**

There is a debate in the literature about whether sustainable cities can be implemented through rational (and in appearance apolitical) planning by urbanists, social scientists and engineers, or if they require a political consensus from a wide range of representatives of the spectrum. The literature often seems to imply that eco-cities are being developed on the ruins of a foregone industrial past, as if sustainability was being implicitly interpreted only as a post-industrial eventuality.

This paper proposes, through a description of the actions taken by a Canadian city towards sustainable development, to describe how these actions have taken place while maintaining and increasing industrial production. It will show that such actions did neither result from any form of technocratic ex-ante planning, nor from any pre-approved political consensus. Rather, the sustainable management decisions taken for Sudbury by large mining firm executives and by local and other levels of politicians were rooted in social movements. These social movements started within the first twenty years of mining operations, but did not bear substantial fruit until approximately 1972 and after.

The Sudbury Basin seems unique in the industrial world. From 1886 to 2016 it has: a) Retained its original mining-smelting complex (the ore bodies have a size and concentration levels unknown anywhere, in an easily accessible location), and there is no end in sight for the mines located there, as new ore bodies keep being discovered. Sometimes, the problems that arise are not for the lack of minerals but, rather, because some ore bodies are too rich to be smelted by the locally available metallurgical processes. b) More than doubled its production in the past thirty years, c) Reduced pollution levels by 95% and, d) Diversified its economy into multiple services sectors, including mining supply services, retail, health care services, education, scientific research, as well as becoming a regional hub for communities located up to 600 km from the region.

## **1 Literature review**

Cluster research relates to firms' localisation and regional development, particularly for those regions which are not fully participating to international trade and try to create conditions likely to foster economic development by attracting new firms from a promising sector (Porter, 2003). Niosi and Bas (2001, 2003) introduced the notion of Regional Systems of Innovation (RSI) observed in Canada, where clusters had developed into RSIs. An RSI comprises large firms attracting smaller suppliers plus high technology firms and other organizations from which

companies gather knowledge and resources, such as financial institutions, universities, government laboratories and research intensive corporations. The RSI approach (Fromhold-Eisebith, 2007) applied well to the mining supply industry of Sudbury (Robinson 2003, 2004, 2006).

Steurer et al. (2005) determined that sustainable development involves three core dimensions, economic, social and environmental, along with national issues such as economic growth, fiscal aspects, competitiveness, and trade balance. For corporations, issues include long term competitiveness, cash-flow performance, and their economic impact on stakeholders (shareholders, employees, clients). Social sustainability requires equity in society and within firms, social improvements, environmental sustainability, long-term resources availability, avoidance of environmental damage, risks, and emissions. Other requirements are transparency, participation, continuous learning/improvement, and intergenerational foresight. In Canada, the latter has been part of Indigenous oral tradition for thousands of years.

Among the variety of views expressed in the literature about sustainable urban development, Lawton (2017) leads one to believe that a continuum of perspectives exists. For example, some consider that a desirable sustainable city can be predefined as a model to be emulated anywhere; others, like Swyngedouw (2009, 2010) argue that sustainability discussions must include alternative socio-environmental possibilities; meanwhile Mössner (2015, 2016) suggests that urban strategies are never neutral and are answers to a prevailing context made of social, economic and political circumstances.

## **2 Context**

### **2.1 Northern Ontario**

Located on the 3.9 billion years old Precambrian Canadian Shield land mass, Northern Ontario is the Northern limit of North America's Great Lakes economic region. The area extends south from Ontario to Illinois, Indiana and Ohio, and from the Eastern Quebec to Minnesota and the U.S. Midwest.

One of the large manufacturing areas in the world, the Great Lakes region comprises three Canadian provinces and eight U.S. states with a total population of 110 million. The region produces about 28% of the U.S. GDP and 60% of the Canadian GDP. Located in Ontario's Mid-North, Sudbury produces non-ferrous metals, manufactured products and services sold in part to clients located around the Great Lakes basin and exported elsewhere.

## **2.2 Sudbury as an ecological disaster**

From 1888 to 1929, mining companies set up roast yards to heat up the copper-nickel sulphide ore in order to burn off the sulphur as sulphur dioxide. Clouds of corrosive acidic smoke formed and destroyed all vegetation on their paths. Animal habitats were destroyed. Birds and small animals disappeared. By 1970, 7,000 acid-laden lakes in the area were deprived of aquatic life (20,000 lakes are located within a 100km radius from Sudbury); 17,000 hectares of land were industrial barrens, and another 72,000 hectares were semi barren as the result of a web of interacting factors (Gunn, 1995, p. 27). Despite keeping infants indoors, the Italian families living near the Copper Cliff roast yard suffered high proportions of infant deaths within the first year after birth. Local physicians diagnosed a «lung disease». After two months of open air burning, the ore was transported by rail to furnaces for smelting.

From 1929 to 1971, open bed roasting had been abandoned, but smelters continued to suffocate the region. In 1960, 2.54 million tonnes of sulphur dioxide and thousands of tonnes of copper, nickel, and iron were released in the atmosphere. In 1972, the construction of a 381m smokestack at the Inco Copper Cliff smelter helped clearing Sudbury's air, but pollutants started destroying vegetation and aquatic life beyond 60 km. Sulphur dioxide readings in Ottawa (500 km south-east) increased to levels beyond those in Sudbury. In 1969, the Ontario government responded for the first time to concerns voiced for decades by the Sudbury community: it imposed annual limits on sulphur dioxide emissions. Further reductions were gradually ordered, recently for 2015, at 66 kilotonnes (kt): the target was missed. As of 2017, yearly emissions were 150 kt, (94% below the 1960 level), but expected to reach 20,000 tonnes by 2018. The reduction in emissions would then reach 99.22% compared to 1960, following \$ 1 billion in upgrades to the Copper Cliff smelter.

## **3 Change Agents and the Transformation of Sudbury**

Change agents included the following: Mining firms' workers and their families, union leaders and other social activists, including miners' wives' groups, and, eventually, executives and managers; Entrepreneurs; Scientists, in particular in the biology and physics departments of Laurentian University, as well as Management professors and sociologists; Most local politicians were prudent followers. In 1944, the first meetings between mining industry and Ontario government representatives focused on the problems with «Sulphur smoke» (Ross, 2008, 32). Important social and artistic groups also played an important role after 1950.

### **3.1 Mining firms' workers and unions**

The mine workers of Sudbury and their families have paid a heavy tribute to the 18 firms who employed them since 1886. For example, 645 deaths occurred in the 1909 to 1929 period. The normal work week in 1906 was reported as being 84 hours a week by a former Inco executive. Thousands of injuries and deaths by respiratory diseases and cancers have been attributed to the toxicity of the environment. Collateral deaths due to sulphur dioxide fumes rejected in the immediate atmosphere also took their toll until 1972. Ethnic segregation was also practiced, whereby most office or security positions at a higher salary were predominantly attributed to English-Canadian, American, and U.K. employees; conversely, workers from Austria, Bulgaria, Finland, Italy, Poland, Romania, Russia, and Yugoslavia, as well as French-Canadians, were overrepresented among the lesser paid, unskilled jobs.

While first attempts to unionize in 1913, 1919, 1933, 1936, 1937 and 1938 lasted no more than one year each, the Mine Mill Union formed a local at Inco in 1942 and obtained a first contract in 1944. Inco executives, supported by the provincial and local governments and by the press, took every possible measure, including acts of violence and dismissals, against unionization. It took unions several labour conflicts and intense lobbying to improve working conditions, recognition and compensation for industrial diseases, and pension plans. After an 11 months strike in 2010, Vale's defined benefit pension plan was abandoned to a defined contribution one for any new employee. This was a setback for unionized workers.

### **3.2 Mining firms' managers and the Manpower Adjustment Committee process**

While the upper management of the mining firms has always been located in larger centres (Toronto, New York, Sao Paulo), mining and smelting operations were locally managed. Environmental and labour relations legislations are provincial. Managers made transforming decisions in terms of adapting operations to reduce pollution and improving labour relations.

These included changes to production processes, workplace health and safety improvements, and labour relation improvements (including the Manpower Adjustment Committee, Cortis, 1984). An upper management decision to divest non-core activities after 1980 had a positive consequence on the development of Entrepreneurship in Sudbury. New companies were formed and some of them flourished within Canada and as exporters.

### **3.3 Entrepreneurs**

Between 1980 and 1990 a variety of workers and engineers employed by the large mining firms were offered cash packages to leave their employment and encouraged to start a business and

become suppliers. This strategic decision made by the two largest mining firms, in order to limit their losses when base metal prices were low, led to the creation of a series of companies in the Mining Supply sector. By 2008, Sudbury mining supply firms were able to procure about 80% of the dollar value of services and products needed by the large mining firms. Comparable data for Antofagasta (Chile) showed that only 30% of supplies were locally procured there. This added significantly to the diversification of the local economy. The Mining Supply Sector includes: Hay farmers; Manufacturers of industrial vehicles, industrial parts and machinery components, explosives, diamonds, drilling equipment, cement and additives, metal fabricating, electrical equipment; Construction firms; Services: geology, insurance, engineering, consulting, environmental testing, custom software designers, security services, occupational medicine, research, testing.

### **3.4 Politicians**

Up until 1944, most Sudbury politicians aligned their values with those of the mining firms' executives. As politics changed, notably with the creation of a centre-left party in Ontario, politicians played a growing role in developing regulations that would result in cleaning the Sudbury environment following the 1886-1970 era of devastation. The creation of Laurentian University in 1960 had profound consequences in the ability of the people to Sudbury to launch a frontal attack against industrial devastation by applying results from research projects conducted by University's scholars (professors and graduate students). Later on, the creation of several local institutions funded by the federal and provincial governments would expand significantly the diversification of the regional economy. These institutions include the Cambrian College (1967), the Municipal Building and the Provincial Building (1976), the Federal Taxation Centre (1982), the Ontario Ministry of Mines (1993), the Geological Survey (1994), the Collège Boréal (1995), the Faculty of Medicine (2005), University Hospitals, Research Centres and other major institutions for research and higher education.

### **3.5 Scientists**

Laurentian University hosted early on a number of scientists who devoted entire careers improving both the ecology of the Sudbury region but also the health of the population. In the early years, infant deaths were very high and, by the early 1960s, there were still workers exposed to toxic fumes in the smelters. Some physicists researched nanoparticles present in the air, while biologists and chemists examined both the effect of sulphur and other fumes on soils and plants and the ways to rehabilitate those soils for new generations of plants to be restored,

including trees. A retired engineer, David Krofchak, obtained patents that allow for a full recovery of the metals and other valuable minerals present in the 130 million tonnes of smelter slag located between Copper Cliff and Sudbury. The industrial process is not yet economical but could well become viable in the future. Other scientists of note belonged to the Biology Department, to Research Centres, and other Faculties. Physics research at Laurentian University eventually led to the creation of a joint effort with Queen's University in Canada and several others across the world, the Sudbury Neutrino Observatory. Located at 2,200 metres below ground, above Sudbury's oldest mine, the SNO scientists obtained the region's first Nobel Prize in 2015.

## **4 End Results**

### **4.1 Environmental Remediation**

Despite planting over 11 million trees, in 2001, a report from the Ontario Ministry of the Environment (MOE) identified excessive concentrations of nickel, cobalt, copper and arsenic in surface soil (top 5 cm) in areas located near present or former smelters. Ontario legislation mandated further study and the MOE recommended: 1. To undertake a more detailed soil study to fill data gaps, and 2. To perform a human health and ecological risk assessment. Both large mine firms Inco Ltd. (now Vale) and Falconbridge Ltd. (now Glencore) voluntarily accepted the recommendations and began working together to establish what is commonly referred to as "The Sudbury Soils Study". Four other major stakeholders in Sudbury were overseeing this study: the Ministry of the Environment, the Sudbury & District Health Unit, the City of Greater Sudbury, and Health Canada First Nations and Inuit Health Branch. A Public Advisory Committee was also established to help address questions and concerns about the potential impact of elevated metal levels on the local environment and on human health. However, local unions were only involved at a later stage and remained critical. A comprehensive soil sampling and analysis program was undertaken in 2001 by the MOE and the mining companies. Approximately 8,000 soil samples were collected from urban and remote areas and analyzed for 20 elements. Early in 2003, a consortium of consulting firms working together as the SARA (Sudbury Area Risk Assessment) Group was retained to undertake the risk assessment portion of the study. Regreening efforts continue, with an annual report being published regularly.

#### **4.2 Economic Structure**

The economic structure of the Sudbury region has evolved from having a mining sector driving most of the economy to a mix of several economic engines ensuring the long-term future of the city. These include a strong public sector comprising decentralized government services such as a federal tax centre employing over 2,000 and one ministry of the provincial government (Northern Affairs and Mines), plus other agencies' regional offices. Other major sectors include health, education, research, technical services, high technology and retail.

#### **4.3 Health**

Pollution-related diseases are expected to have regressed over the period extended since 1972, following the erection of a smokestack that reduced toxic fumes over the region. Further pollutants were gradually removed in the subsequent decades until the air became exposed to less than 5% of the original pollution levels. Typical diseases included heart and lung diseases, elevated cancer levels, and psychological diseases and illnesses. There exists a body of research on population health in the Sudbury region over the past decades.

#### **4.4 Education, Research and Development**

The level of education has increased dramatically following the generalization of high school education and the creation of postsecondary institutions. Since the 1990s, the expansion of research facilities has encouraged both fundamental and applied research about mining as well as in health care fields and in a wide range of other areas of knowledge. These include cancer, diabetes and other disease-related fields, fine particles, micro-robotics as well as space and industrial robotics, astronomy, and physics.

#### **4.5 The Sudbury Innovation System**

The four main components of the Sudbury Innovation System (SIS) include: 1) the two large mining firms, Vale and Glencore, as well as four smaller ones; 2) over 350 firms supplying and servicing them; 3) thirty research centres, a majority of them residing within Laurentian University, the others being housed at Boréal and Cambrian Colleges; most of these research facilities have been created since 1995, and are oriented primarily towards mining-related sciences (robotics, rock mechanics), and environmental sciences. 4) Government agencies supporting research and development: FedNor funds projects across Northern Ontario on account of the federal government; the Northern Ontario Heritage Fund does the same for the

provincial level; National research granting agencies fund academic research and the institutions which are part of the SIS (local universities, colleges, research centres).

## **5 Barriers to sustainable development**

### **5.1 Industry and investors' attitudes towards sustainability**

Mining and energy-related industry managers are described as being worried about sustainability issues by management experts (Bailey, 2017) and express similar comments in public. Long-term investors such as pension funds and sovereign fund managers value the importance of management credibility more than quarterly data. At the same time, investors consider that sustainability efforts have a positive impact if they contribute to increase cash flows in the long run. As a result, sustainability management will be difficult to implement when it carries additional costs that cannot be recovered by charging clients higher prices.

Industrial sustainability can be achieved in specific industries when extra costs can be recovered, or, better, when sustainable actions result in net savings. In the aluminium industry, for example, productivity increased due to increased recycling that allowed for increased production at lower costs. The aluminium industry has been actively encouraging recycling, as the cost of producing recycled aluminium is 90% below the cost of producing primary aluminium. As a result, the aluminium industry is pursuing the goal of sustainable development by aiming at an optimal level of recycling. Sustainability improvements are obtained across the supply chain starting with raw material procurement, and throughout the integration of the value chain by managing the entire aluminium life cycle.

### **5.2 Technological barriers**

In Sudbury, a technological barrier to sustainable management has been the differences in the smelting and metallurgical processes used by the two major firms. These two firms have been using electrical arc processes that are very costly in energy, to the point where these firms have been the largest clients of Ontario Power Generation (OPG) since the smelters entered in operation before 1930.

The depth of the mines, some of them close to 3,000 metres below surface, is also very costly in energy for ventilation equipment and for water pumping. New research projects with local research centres have been funded in order to develop alternatives to mine ventilation: one option seriously studied is to equip each individual working at these depths with a self-

containing suit that would have similar effects as a cosmonaut suit in space in terms of protection as well as ability to communicate in real time with the surface.

### **5.3 Political and infrastructure barriers**

Politics and infrastructure availability in a given region are often related issues, given that most of infrastructure construction depends on political decisions. In the case of Sudbury, politics have also been a barrier to sustainable development because of the tendency of voters to elect representatives from opposition parties. The lack of provincial and federal government advocates for the region has resulted in a northbound four-lane expressway being more rapidly built between Toronto and a smaller centre less than half than Sudbury in population (but voting on governments' side more often). Other infrastructures are also lacking: wider-body airplanes cannot land at the airport due to a runway being too short for them; Sudbury is also lacking an intermodal terminal that would allow container transfers from rail to road and vice-versa.

Located 375 km from Toronto, Sudbury has lagged the rest of Ontario in development as its location is slightly off from the main heavy industrial core of the Great Lakes Region, even if the mines from Northern Ontario provide about twenty minerals that are essential to most of the manufacturing industries of Central Canada and the U.S. Midwest.

## **Conclusion**

To a large extent, the onset of sustainable development in Sudbury has been the result of a grassroots movement that came from coalitions of specific groups. The unionization of mine and smelter workers was the first level of community empowerment that was reached by the population. Through collective bargaining, workers obtained better protection against pollution, compensation for diseases that became very costly for firms' shareholders: this forced management to invest in reducing toxicity. When the Sudbury pollution started spreading southward, affecting the ecology of communities closer to Toronto or Ottawa, governments realized the seriousness of these issues and legislated to improve environmental protection. Recent developments since the purchase of Inco by Vale, have shown that earlier improvements such as pension plans can be jeopardized again. There are renewed concerns for safety in the Sudbury mines as well.

Scientists from Laurentian University and other academic institutions in Canada and elsewhere were another important category of contributors to the effort towards a sustainable community. They often provided the scientific evidence necessary to advocate in favour of

workers victims of industrial illnesses. They were able to rally local politicians and health care professionals in acting positively towards sustainability.

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## A COMPARATIVE ANALYSIS OF DIRECT MARKETING STRATEGIES USED BY RETAIL CHAINS IN THE PARDUBICE REGION

Jan Chocholáč

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### Abstract

**Purpose:** The purpose of this paper is to analyse and compare some marketing strategies of direct marketing from the perspective of retail chains in the Pardubice region in selected period. Direct marketing is one of the most popular forms of communication mix used by retail chains in the Czech Republic, although prospectuses of each retail chain are very different. The aim of this paper is to compare and analyse prospectuses used by selected retail chains in the Pardubice region and imply some innovation for management of direct marketing strategies used by retail chains.

**Design/methodology/approach:** The paper assumes the use of these scientific methods – primary qualitative research (survey among customers of analysed retail chains and testing hypothesis using chi-square test), secondary qualitative research (comparative analysis and content analysis of prospectuses analysed retail chains). The article analyses 37 basic prospectuses and 10 special prospectuses used in December 2016 by these retail chains in the Pardubice region – Lidl Česká republika v.o.s. (Lidl), Penny Market s.r.o. (Penny Market), Tesco Stores ČR a.s. (Tesco), GLOBUS, spol. s r.o. (Globus), Kaufland Česká republika v.o.s. (Kaufland) and AHOLD Czech Republic, a.s. (Albert).

**Findings:** The paper provides empirical insights about marketing strategies of direct marketing used by retail chains in the Pardubice region in December 2016 which was the period with the biggest turnover in 2016.

**Research/practical implications:** The research provides the comparison and evaluation of prospectuses of retail chains in the Pardubice region in the selected period. The paper suggests innovative recommended marketing strategy for prospectuses of retail chains which they can use especially in Pardubice region. On the other hand results of this analysis can be used by retail chains in innovation of management of their marketing strategies at the national level. Small and medium enterprises can use some results of this analysis for advertising

of their products in prospectuses of retail chains and for innovation of their marketing strategies.

**Originality/value:** This paper analysed, compared and evaluated direct marketing strategy of the retail chains in the Pardubice region and suggested recommended and innovative direct marketing strategy for prospectuses of retail chains and for small and medium enterprises.

**Keywords:** Communication mix, Direct marketing, Retail chain

**JEL Codes:** M31, M37

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## **Introduction**

The current market is affected by globalization, changing shopping behaviour of customers, modern distribution and communication channels and turbulent changes. All market operators and entrepreneurship must continually adapt to these changes, because ability to adapt can be a decisive factor in the market competition. This article focuses on the six largest retail chains in the Pardubice region, which offer food and non-food products, and their direct marketing strategies applied in December 2016 in leaflets of these retail chains. The aim of this article is to analyse these leaflets using content and comparative analysis and compare selected retail chains and their direct marketing strategies in combination with the primary qualitative research (the survey among customers of analysed retail chains). Results of the primary and secondary qualitative research implicate some innovative approaches and recommendations for retail chains and entrepreneurs (small and medium enterprises) in terms of innovation management of their direct marketing strategies, which they can subsequently use.

### **1 Marketing communication and direct marketing**

Porcu, Barrio-García and Kitchen (2012) and Lund and Marinova (2014) defined marketing communication as the main persuasive element which organizations can use to connect with its markets by communicating ideas and seeking to impart particularly perceptions of brands, products and services to customers, consumers and to each stakeholder (suppliers, subscribers, employees, management, shareholders, various associations related to environment, state, representatives of the region etc.). Batra and Keller (2016) and Csikósová, Antošová and Čulková (2014) emphasized modern trends in marketing communication and presented conceptual framework for integrated marketing communication.

Katole (2012) stated that retailers are using sophisticated communication and information systems to manage their businesses. The author described the most important tool for communicating with the customers – retail advertising. Retailers use for advertising the television, newspaper, radio, billboards, leaflets, magazine, website, E-mail (Katole, 2012).

Bose and Chen (2009) specified that for product advertising and promotions there are two main approaches which are used in practice – mass marketing and direct marketing. Authors described direct marketing as communications where data are used systematically to achieve quantifiable marketing objectives and where direct contact is made or invited between a company and its customers and prospective customers. Nash (2003) and Foret (2006) emphasized some advantage of direct marketing, there are: the concentration, personalization

and immediacy. Clow and Baack (2008) stated that getting of a leaflet is very often the first step of the shopping cycle. Authors described some important advantages of leaflets. The leaflets are shared by several people and customers have enough time to see them.

## **2 Methods and data**

The article uses a combination of the primary (subchapter 2.1) and secondary (subchapter 2.2) qualitative research.

### **2.1 The primary qualitative research**

The primary qualitative research was performed in January 2017 (from 2. 1. 2017 to 31. 1. 2017). Respondents consisted of Pardubice residents aged from 15 to 90 years old. Pardubice has approximately 90 000 residents (it was the initial population). Hague (2003) defined the sample size of 384 respondents for the initial population size to 100 000. The author specified that 384 respondents ensure 95 % credibility and 5 % of sample error of the research. The representative sample consisted of 384 respondents (200 women and 184 men) distributed into age groups according to initial population. Structured interviews with these questions were selected as a technique for data collection:

- Informative questions (gender and age).
- Do you read any leaflets of these retail chains – Lidl, Penny Market, Tesco, Globus, Kaufland and Albert? – Definitely, yes. / Rather, yes. / Rather, not. / Definitely, not.
- Do you decide according to the information from these leaflets? – Definitely, yes. / Rather, yes. / Rather, not. / Definitely, not.
- Are you most interested in any group of products in the leaflets? – Fruit, vegetables and flowers. / Non-alcohol beverages. / Alcohol. / Chilled products. / Frozen products. / Dry groceries. / Drugstore products. / Pet food. / Non-food.
- Which retail chain in the Pardubice region do you prefer most for your shopping? – Lidl. / Penny Market. / Tesco. / Globus. / Kaufland. / Albert.

### **2.2 The secondary qualitative research (comparative and content analysis)**

The secondary qualitative research was performed in January 2017. The research focused on leaflets used by six largest retail chains in the Pardubice region (Lidl, Penny Market, Tesco, Globus, Kaufland and Albert) in December 2016. The comparative and content analysis were used for this secondary qualitative research.

Thiem (2016) described qualitative comparative analysis as comparisons of phenomena, works or systems etc. based on qualitative criteria. The author charted evolution of qualitative comparative analysis and he defined some standards for this type of analysis.

Goncalves, Cota and Pimenta (2012) defined content analysis as the analysis of documents of various forms and transformation of findings to reduced text. Authors used content analysis for example for identifying keywords and metadata to search learning objects on the web, based on learning outcomes extracted from official documents used in the course units.

The secondary qualitative research was focused on these areas of analysed leaflets:

- number of leaflets in analysed period,
- total validity (in days) of all leaflets used in December 2016,
- average number of pages of leaflets,
- total area of used leaflets in December 2016 (dm<sup>2</sup>),
- paper type,
- number of discounted goods (food and non-food products),
- number of discounted goods by the range of goods (fruit, vegetables and flowers / non-alcohol beverages / alcohol / chilled products / frozen products / dry groceries / drugstore products / pet food / non-food),
- average area (dm<sup>2</sup>) for one product in leaflets.

### **2.3 Data**

For the secondary qualitative research there were selected paper leaflets of these retail chains – Lidl, Penny Market, Tesco, Globus, Kaufland and Albert, which were used as a marketing communication tool in Pardubice in December 2016. The overview of the analysed leaflets is in Tab. 1, where the validity of leaflets is presented, too.

**Tab. 1: Overview of leaflets used by retail chains in the period from 1. 12. 2016 to 31. 12. 2016**

Leaflets of Retail chains from 01. 12. to 16. 12.	Notes	01.	02.	03.	04.	05.	06.	07.	08.	09.	10.	11.	12.	13.	14.	15.	16.					
Albert	1, 2	23. 11. – 06. 12. (F + NF)						07. 12. – 13. 12.						14. 12. – 19. 12.								
Globus	3, 4	01. 12. – 07. 12.						08. 12. – 14. 12.						15. – 21. 12.								
Kaufland	5	01. 12. – 07. 12. (F + NF)						08. 12. – 14. 12.						15. – 24. 12.								
Lidl	6	28. 11. – 04. 12.			05. 12. – 11. 12.						12. 12. – 18. 12.											
Penny	7, 8	01. 12. – 04. 12.			05. 12. – 07. 12.			08. 12. – 11. 12.			12. 12. – 14. 12.			15. – 18. 12.								
Tesco	9, 10	30. 11. – 06. 12.						07. 12. – 13. 12.						14. 12. – 24. 12.								
Leaflets of Retail chains from 17. 12. to 31. 12.	Notes	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.						
Albert	1, 2	14. 12. – 19. 12.			20. 12. – 24. 12.						25. 12. 2016 – closed	26. 12. 2016 – closed	27. 12. – 31. 12.						X			
Globus	3, 4	15. 12. – 21. 12.			21. 12. – 28. 12.			29. 12. – 04. 01.					21. – 28. 12.									
Kaufland	5	15. 12. – 24. 12.						21. 12. – 24. 12.					27. 12. – 31. 12. (F + NF)									
Lidl	6	12. – 18. 12.			19. 12. – 24. 12.								27. 12. – 31. 12.									
Penny	7, 8	15. – 18. 12.			19. 12. – 24. 12.								22. 12. – 24. 12.			27. 12. – 31. 12.						
Tesco	9, 10	14. 12. – 24. 12.						20. 12. – 24. 12.					27. 12. – 31. 12.									

Notes: Albert and Kaufland used two leaflets in the same week, the first of them was for food products (shortly F) and the second of them was for non-food products (shortly NF). Retail chains used in addition some special leaflets with longer validity, for example notes 1, 2: Albert (30. 11. – 31. 12. and 07. 12. – 24. 12.); notes 3, 4: Globus (24. 11. – 24. 12. and 01. 12. – 24. 12.); note 5: Kaufland (01. 12. – 24. 12.); note 6: Lidl (17. 11. – 24. 12.); notes 7, 8: Penny (01. 12. – 14. 12. and 15. 12. – 31. 12.); notes 9, 10: Tesco (30. 11. – 24. 12. and 07. 12. – 24. 12.)

Source: author

### 3 Results

Results of the research are divided into the primary qualitative research focused on survey among customers of analysed retail chains and into the secondary qualitative research aimed on leaflets of analysed retail chains used in December 2016.

#### 3.1 The primary qualitative research

The representative sample consisted of 384 people (200 women and 184 men) distributed into age groups according to initial population. There are answers from respondents.

Question: “Do you read any leaflets of these retail chains – Lidl, Penny Market, Tesco, Globus, Kaufland and Albert?” Answers: “definitely, yes” – 44 % (167 respondents); “rather, yes” – 25 % (96 respondents); “rather, not” – 11 % (43 respondents); “definitely, not” – 20 % (78 respondents). Question: “Do you decide according to information from these leaflets?” Answers: “definitely, yes” – 35 % (134 respondents); “rather, yes” – 19 % (73 respondents); “rather, not” – 20 % (77 respondents); “definitely, not” – 26 % (100 respondents).

69 % (263) of respondents read usually some leaflets of retail chains (answers “definitely, yes” and “rather, yes”), but only 54 % (207) of respondents decide by the leaflets about purchasing in specific retail chain (answers “definitely, yes” and “rather, yes”).

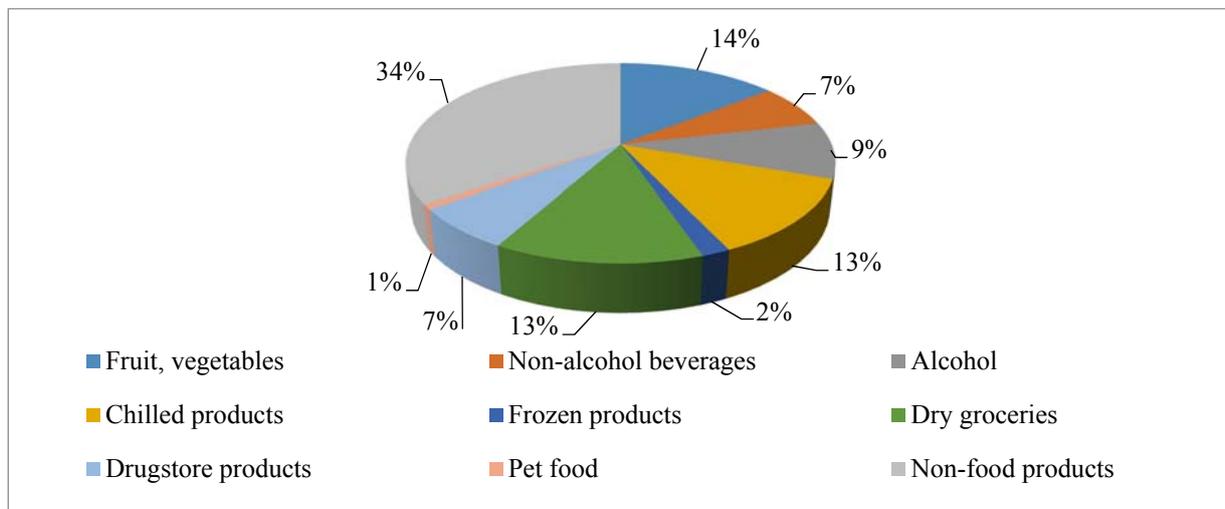
Two null hypotheses were tested using chi-quadrade test (relation 1).  $H_0$ : The share of leaflet reader's is the same for men and women.  $H_0$ : The share of people who decide according to information from leaflets is the same for men and women.

$$\chi^2 = \sum_{i=1}^k \frac{(X_i - Np_i)^2}{Np_i} \quad (1)$$

The first hypothesis  $H_0$  was rejected (p-value = 0.00000000565; critical value = 0.05; level of significance 95 %). The share of leaflet reader's is different for men and women and women read leaflets more than men. The second hypothesis  $H_0$  was rejected too (p-value = 0.002613; critical value = 0.05; level of significance 95 %). The share of people who decide according to information from leaflets is different for men and women and the women decide by the leaflets about purchasing in specific retail chain more than men.

Respondents are most interesting in these groups of products in leaflets (see Fig. 1): non-food products (34 %); fruit and vegetables (14 %); chilled products (13 %) and dry groceries (13 %). Other groups of products gained less than 10 % – alcohol (9 %), non-alcohol beverages (7 %), drugstore products (7 %), frozen products (2 %) and pet food (1 %).

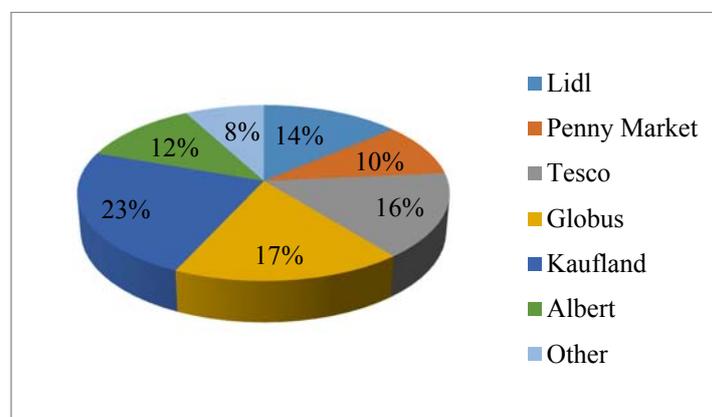
**Fig. 1: Are you most interested in any group of products in the leaflets?**



Source: author

Respondents prefer these retail chains (see Fig. 2): Kaufland (23 %; 91 respondents), Globus (17 %; 68 respondents); Tesco (16 %; 60 respondents); Lidl (14 %; 53 respondents); Albert (12 %; 45 respondents); Penny Market (10 %; 37 respondents) and others (8 %; 30 respondents).

**Fig. 2: Which retail chain in the Pardubice region do you prefer most for your shopping?**



Source: author

### 3.2 The secondary qualitative research (comparative and content analysis)

Six analysed retail chains used 47 leaflets in December 2016 (Tab. 2). Most leaflets distributed to customers the retail chain Penny Market (11 leaflets). Lidl used at least leaflets (6 leaflets) with the shortest period of total validity (53 days). Leaflets of Albert were valid in total for 84 days, because Albert used two special leaflets and six classical leaflets.

Penny Market used for leaflets at least average number of pages (13,09 pages / leaflet), but the most average number of pages had leaflets of Tesco (38,00 pages / leaflet). Lidl used in December 2016 for direct marketing leaflets with the most total area (2 279,06 dm<sup>2</sup>), but on the other hand Penny Market used leaflets with at least total area (1 335,25 dm<sup>2</sup>).

Most retail chains used the combination of recycled and glossy papers for leaflets, although Lidl used only leaflets from glossy paper. Companies also used leaflets from glossy paper for special leaflets with longer period of validity. Tesco presented in leaflets most discounted products (overall 2 381 products), then Penny (2 218 products) and Albert (1 921 products). Lidl presented at least discounted products in their own leaflets (only 1 132 products). It is approximately about half less than Tesco.

**Tab. 2: The comparison of leaflets used by retail chains in December 2016**

Retail chain	Number of leaflets	Total validity (days)	Average number of pages	Total area of leaflets (dm <sup>2</sup> )	Paper type	Number of goods
Albert	8	84	24,00	1 351,93 dm <sup>2</sup>	3 x glossy, 5 x recycled	1 921
Globus	7	78	29,71	1 467,23 dm <sup>2</sup>	2 x glossy, 5 x recycled	1 853
Kaufland	8	69	22,00	1 574,73 dm <sup>2</sup>	3 x glossy, 5 x recycled	1 412
Lidl	6	53	37,33	2 279,06 dm <sup>2</sup>	6 x glossy, 0 x recycled	1 132
Penny	11	64	13,09	1 335,25 dm <sup>2</sup>	2 x glossy, 9 x recycled	2 218
Tesco	7	76	38,00	1 398,16 dm <sup>2</sup>	2 x glossy, 5 x recycled	2 381

Source: author

Tab. 3 presents share (%) of discounted goods by the range of goods in analysed leaflets used by retail chains in December 2016 in Pardubice.

**Tab. 3: Share of discounted goods by the range of goods (%)**

Retail chain	Fruit, vegetables	Beverages (non-alcohol)	Alcohol	Chilled products	Frozen products	Dry groceries	Drugstore products	Pet food	Non-food
Albert	3,38	4,27	14,21	21,40	1,93	19,16	11,14	1,56	<b>22,96</b>
Globus	3,02	2,32	8,80	17,43	1,35	13,17	5,40	0,97	<b>47,54</b>
Kaufland	4,60	2,62	11,05	<b>25,71</b>	3,47	<b>25,71</b>	7,15	1,13	18,56
Lidl	3,18	1,77	7,60	20,32	2,30	10,78	0,88	0,71	<b>52,47</b>
Penny	3,43	5,46	9,69	23,49	5,09	<b>31,70</b>	8,88	2,66	9,60
Tesco	3,19	2,35	10,21	16,25	2,52	19,24	11,42	2,31	<b>32,51</b>

Source: author

All retail chains didn't emphasize presenting of pet food (share between 0 – 3 %), fruit and vegetables (share between 3 – 5 %), non-alcohol beverages and frozen products (share between 1 – 6 %) in analysed leaflets. Retail chains emphasized non-food products (especially Lidl – 52,47 %, Globus – 47,57 %, Tesco – 32,51 % and Albert – 22,96 %). Kaufland emphasized chilled products and dry groceries (both 25,71 %) most and Penny Market most communicated discounts on dry groceries (31,70 %).

## **Conclusion**

Nowadays, there are many modern communication tools that can be used for marketing strategies of retail chains, entrepreneurship and for small and medium enterprises. The research has shown that direct marketing strategies using by retail chains in Pardubice are popular with customers. 69 % of respondents usually read some leaflets of the retail chains and 54 % of respondents decide by the leaflets about purchasing in the specific retail chain.

Respondents (customers) are most interested in these groups of products in leaflets: non-food products; fruit and vegetables; chilled products and dry groceries, but the retail chains emphasized non-food products; chilled products and dry groceries. The retail chains did not support fruit and vegetables enough in analysed leaflets, but customers are most interested in this group of products. The recommended innovation of direct marketing strategy for retail chains, entrepreneurship and for small and medium enterprises consists in greater promotion of fruit and vegetable products in leaflets used in December based on the primary and secondary qualitative research. This paper suggested innovative marketing strategy for prospectuses of retail chains in Pardubice region, but some results of the analysis can be used by retail chains in innovation management of their marketing strategies at the national level. Small and medium enterprises can use some results of this analysis for advertising of their products in prospectuses of retail chains and for innovation of their marketing strategies.

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**INCREASING THE COMPETITIVENESS AND PERFORMANCE OF  
ENTERPRISES FOCUSING ON INNOVATION ACTIVITY –  
EMPIRICAL SURVEY**

**Simona Činčalová**

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**Abstract**

**Purpose:** The paper focuses on selected factors increasing the competitiveness and performance. It analyses specific factors, such as human resources, corporate culture, access to customers, quality and cost of production, but especially innovation activity. Innovations in general are an integral part of the activities of each company because of new technologies and new possibilities of solving those situations in this period. Innovations that are correctly applied, can give the companies a competitive advantage through the cost savings and performance improvement.

**Design/methodology/approach:** The paper uses an empirical survey, 15 interviews with the directors and top management of the selected companies. The interview were done directly in enterprises in the second half of 2016 and lasted a half an hour. This is a random selection of companies which were willing to answer the questions (response rate was 50 percent due to addressing the known) and operates in the Czech Republic. The data were supplemented by the theory in this field and documentary analysis, including internal documents, descriptions of internal processes, employee magazine articles.

**Findings:** There are many factors of competitiveness. Companies are trying to get as many competitive advantages as they can. The paper suggests that the innovations are one of the best ways.

**Research/practical implications:** The paper contains factors for increasing the competitiveness and performance of companies. It suggests that the innovations are the most effective way for the development of enterprises and they should focus on them for the success. But this topic deserves a future research.

**Originality/value:** The paper complements and extends findings of Czech and foreign studies in this field. There are lots of studies about competitiveness and its increasing (f. e. Lu, Shen and Yam (2008), Enright and Newton (2004), Bhatnagar and Sohal (2005)), but no study is comprehensive about the Czech Republics' enterprises.

**Keywords:** Innovations, Competitiveness, Development

**JEL Codes:** O30, O34

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## **Introduction**

Competitiveness is considered as a key criterion for assessing the success of countries, industries and companies. Aiginger (2006) dealt with the competitiveness as a welfare creating ability with positive externalities. Today's highly competitive market environment is forcing companies to continuously improve, whether it is about reducing costs, increasing sales or generating goodwill. Improvements are not only purely reactive, but there are also some proactive (including innovations according to Johnson, 2006).

There are lots of studies about competitiveness, its importance and increasing (including Lu & Shen & Yam (2008), Enright & Newton (2004), Bhatnagar & Sohal (2005), but no study is comprehensive about the Czech Republics' enterprises. The results of this paper are based on 15 structured interviews with executives, trade, production and technical directors, analyzes case studies of selected companies and try to find an answer to the key question – whether the current practice of increasing competitiveness and performance management in enterprises coincides with the theoretical background of this problem. It focuses primarily on innovative activities which is nowadays a frequent term. The results of research (Cefis & Marcili, 2006) show that innovation has a positive and significant effect on the probability of firm's survival.

## **1 Theoretical background**

Horn (1992) and Slevin & Covin (1995) discovered the link between competitiveness, performance, and factors which influence them. Based on the research literature review that examine the factors of competitiveness of enterprises, Chan & Lau & Man (2002) identified three basic factors that affect competitiveness and subsequently business performance. These groups of factors included internal factors, environmental factors (in which the company operates and the personality of the owner or manager).

The internal factors include financial and human resources, technology used, organizational structure, innovation, quality and variety of goods and services, business reputation, flexibility and quality customer support.

The external factors are changes in the external environment, which is necessary to expect for increasing the competitiveness of the company prepare for them. Alternatively, the company should try to change the external environment alone in its favor. According to Blažek (1998) these factors are for example competition in the product markets where the company operates, the bargaining power of buyers and suppliers, corruption around the enterprise, support for enterprise from state authorities and from local authorities.

Another factor that affects the competitiveness of the company, is a person of manager or owner – his experience, knowledge and skills.

Factors of competitiveness are examined by many other authors, for example Lu & Shen & Yam (2008), Enright & Newton (2004), Bhatnagar & Sohal (2005) and Singh & Garg & Deshmukh (2007).

In Table 1 there are examples of factors that directly and indirectly affect business competitiveness.

**Tab. 1: Factors of competitiveness**

Impact of Factors	
Direct	Non-direct
<ul style="list-style-type: none"> <li>• Attractiveness of the Company</li> <li>• Innovations</li> <li>• Human Resource Management</li> <li>• Technology</li> <li>• Customer Support</li> </ul>	<ul style="list-style-type: none"> <li>• Quality of Products</li> <li>• Range of Goods</li> <li>• Research and Development</li> <li>• Education Support</li> <li>• Managers' Experiences, Knowledge</li> <li>• Organizational Structure</li> </ul>

Source: own processing

## 2 Methods

As the empirical research, the questionnaire procedure for interview (interview supported by a questionnaire) with experts was applied in order to get a feedback. This method was chosen because interviews are more flexible as questions can be adapted and changed depending on the respondents' answers. The questionnaire was drawn up specifically based on the authors' experiences, there was no study as an inspiration. It was semi structured with five research questions about the factors of competitiveness. The goal of this research was to recognize its knowledge and using in companies.

Fifteen participants (directors and top management of the selected companies) were asked individually in the interview. The interviews were done directly in enterprises in the second half of 2016 and lasted a half an hour. This is a selection of companies across firms' sizes and sectors which were willing to answer the questions (response rate was 50 percent due to addressing the known) and operates in the Czech Republic. The interpretation of findings of the interviews were supplemented by the theory in this field and documentary analysis, including internal documents, descriptions of internal processes, employee magazine articles.

At the beginning, there were 30 big companies (over 50 employees) in basic research sample, across all the sectors to ensure the representativeness. Data was collected using e-mail communications and personal visits in enterprises. Everybody was familiar with putting its names in this paper.

### **3 Results**

Gaining a competitive advantage achieving a certain level of business performance is the main precondition for successful operation of the company in the long term in today's highly competitive environment.

To determine the factors that help enterprises increase competitiveness and thus achieve a certain level of performance data was used semi structured interviews with the directors and executives of selected companies operating in the Czech Republic. The data were supplemented by the documentary analysis, including internal documents, descriptions of internal processes, employee magazine articles. The results are divided into several parts, because it came out during the data analysis.

#### **3.1 Human Resources**

Investment in human resources or employees is one of the most important factors that affect the positive development of the company. For example, the company **CANIS Safety**, a.s., a leading importer, manufacturer and distributor of personal protective equipment and tools ensuring safety and health at work, considers the investment in employees as important as investing in modern technology. They are trying to achieve the employee satisfaction, among others through a variety of benefits – food stamps, training for further education, language courses. Also **Contproduct Futures Society** s.r.o, which manufactures cars and is a relatively young company (operating on the market since 2011), states that human capital is one of the most important factor affecting business performance. For **Bertrams Pečky**, s.r.o. (one of the first manufacturers of stainless steel chimney systems in the Czech Republic) employees are the most expensive but also the most important source of business. Although most of them do not come into direct contact with the customer, their role in production processes is irreplaceable. For this reason, they select employees very carefully and constantly educate, stimulate and motivate them so that their work was the most efficient, highest quality and most productive. Vice versa the staff of **Czech Railways**, a.s., the largest carrier in the Czech Republic and the largest domestic employer, is in constant contact with passengers, and therefore puts on employee training the great emphasis.

### 3.2 Corporate Culture

The human resources are inextricably linked corporate culture – both the company and its staff operate externally, what are the relationships between employees, what's the company climate, what counts as advantages and disadvantages and what values are shared by most workers. In the company **CANIS** employees are carefully selected based on tenders (employees are recruited on the basis of the interview, where they explained exactly what is expected from them and what is contained in of their work), from the first day after joining the company novices are trained and workouts familiar with the history and tradition of the company, its ethical codex, work rules and the various processes that take place here.

**Iveco Czech Republic**, that manufactures buses and public transport vehicles, of course wants to be in the lead among the competitors, offering value and quality for its customers' success. As part of the corporate culture they chose varicoloured way of dressing, which differs according to the employee centres and functions – such as welding has red overalls, pressing room green and controllers orange shirts. Curiously, the company provides all the women one day per year of leave with pay.

**NonStop Recruitment**, s.r.o., doing business in the European market in the area of recruitment – recruitment specializes on job in niche markets where companies usually have problem to find a suitable candidate own way. The company lies corporate culture among the most important factors including for example motivational factors (high commissions from the placement, transparent structure promotion etc.), regular daily program of consultants (sales meetings, business development time), business smart dress code (men – shirts and social trousers, women – skirt and blouse, dress), branch celebration if one of the consultants makes a placement, regular printed monthly newsletter with the most successful consultants (for them all-expense paid trips to exotic destinations), trips around the Czech Republic, themed evenings (tasting, poker nights, sports lessons) and other team building activities.

Corporate culture is built, among others, in company **Bohemiatex**, s.r.o. (manufacturer of technical fabrics for thermal and acoustic insulation in the automotive and construction) and **Haniš log houses**, s.r.o. (manufacturer of massive wooden structure). In the company Haniš the communication is based on “addressing behalf” across the enterprise level. Bohemiatex also has informal relationships at work, cares about cooperation of employees, work in a team, good communication, pleasant environment and share common values.

### 3.3 Customer Approach

Products and services as a factor of business competitiveness, by their nature, are the subject of to business companies, and one of the reasons for their existence. In contrast, approach to customers and their needs is the added value that builds our products and services in a better light if there is a positive access. The company **CANIS** is trying to be the most helpful in the approach to customers, for example, it offers a 5% discount when customer's shopping in the e-shop in combination with free shipping on purchase over CZK 1000, registered customers have 10% discount and purchased goods may be replaced on store in case of improperly selected size.

**Iveco** is trying to take care about their customers not only during the sale, but also supports after-sales activities. It has a customer service centre, which is composed of eighty operators, and guarantees an immediate response in ten languages. The company **Futures** does not measure customer satisfaction, but they are aware that customers are satisfied, when they repeat their order and don't claim products. **Bohemiatex** constantly strives to improve the quality of customer service and improve the systems supporting customer care. It has been implemented module CRM (Customer relationship Management), as part of this improvement in the company, which is directed to customers and is characterized by the formation of active and maintaining long-term beneficial customer relationships. The company also participates the trade fair *Techtextil*, which is held every two years. Participation brings several advantages, for example making contact with potential customers, meeting the existing customers and suppliers in one place. The company **Haniš** also takes care of direct contact with customers and their complete satisfaction and confidence among consumers and the business. For example, the whole process of construction of wooden houses begins with a meeting with the director of enterprise.

**Ontex CZ**, s.r.o., the company that manufactures hygiene products, uses the GRI index, which is internationally recognized and is a great tool for communication and advocacy of CSR activities both inside the company and stakeholders. The company monitors this GRI index in the context of sustainability, socially responsible measures the activity of the organization. The calculation is very complicated.

### 3.4 Quality and Cost of Production

The customer decides about buying or non-buying the product primarily on the basis of quality and price of goods and services. This is why **CANIS** focuses on the low cost of its production, but at the same time maintaining its high quality. The company can afford to push down the

price due to the large quantity of sold goods. Quality is guaranteed by CXS brand under which the vast majority of goods is sold and the goods are manufactured exclusively for CANIS.

Established and certified system of quality management, occupational safety and health management system and energy management is one of the greatest tools in achieving the objectives used by **Czech Railways**. This system is set up according to internationally recognized requirements of ISO 9001, OHSAS 18001 and ISO 50001.

Also **Bohemiatex**, **Haniš** and **FrostFood** (frozen food company) consider the quality management as one of the decisive factors of stable economic growth. FrostFood that demonstrates its mission: to offer the customers a comprehensive range of complex support services, professional approach and especially quality products at unbeatable prices.

**OEZ**, s.r.o. (supplier of products and services in the field of protection of electrical circuits and low voltage) uses a system of continuous improvement called Kaizen. Ontex has a quality policy based on three main pillars (continuously meet the requirements of consumers, ensure the safety of all the products for their intended use and compliance with all applicable regulations and focusing on continuous improvement of processes and products).

### 3.5 Innovation Activity

Innovation in general are an integral part of every business activity, already for that reason that the time brings constantly new technologies and possibilities of solving those situations. Properly applied innovation can give companies a competitive advantage through cost savings and increased performance. Directors and executives of all analysed companies mentioned, during structured interviews, that they consider innovation as one of the most important factors that allow them to increase their competitiveness and thus achieve higher levels of performance.

Company **CANIS** has recently introduced an electronic reader for faster, more efficient and more precise inventories, but also for evidence of goods received at the warehouse stores. Another innovation was the equipment for permanent staff – new mobile phones with applications in which they can easily check the availability of the goods offered in the shop. Also **Iveco**, **Czech Railways**, **Bohemiatex** and **Bertrams** focus on innovative thinking and development of new technical solutions.

The highly export-oriented company **FrostFood** must be active and especially innovative to be always ahead of your competitors. The share of new products in total sales is around 20% in recent years. For example, the latest upcoming product is called hot-dog pizza for the English market – it is a pizza with stuffed edge of the park. On the domestic market the company enters in the first half of 2017 with a new line filled dumplings that are gluten-free.

Due to the introduction of unbaked pizza with stuffed cheese edge had to increase production capacity (technological innovation). The company has completed a major investment in the purchase of new production line, which can automatically dispense cheese strand, and at the same time close the border. FrostFood's vision is: being flexible, independent manufacturer of frozen foods with a high proportion of innovative products that can flexibly respond to customer needs and requirements or market, bringing new innovative products.

Also **OEZ** constantly devotes its attention to expanding its product portfolio and progressive innovations of produced assortment. Even **Haniš** (log house) introduces new technologies in the production because of the wood will not burst. **Columbia Press**, a.s., which is engaged in printing and graphic arts, has created an innovative project "Braille type" in application on flexible materials,

**Tristone Flowtech**, s.r.o. creates new technologies in the automotive industry and is one of the main suppliers of automakers. **MEDESA**, s.r.o. cares about laboratory equipment by quality, reliable and the most modern technology, and the innovative activity is for the company in the first place.

**Ontex** is trying to get fast and quality innovation that brings them lasting advantage over the competitors, become a trustworthy partner, save on costs and help with fixing pricing and protect against commoditization. The success of innovation lies in four technical centres of research and development, partnerships with research institutes and universities, the ability of registration of patents and extensive testing with consumers through internal and external panel tests.

### **3.6 The Other Factors**

There are also the other factors affecting the competitiveness of the company. These include beyond another access to financial resources, costs, bargaining power of suppliers and customers and strategies. The strategic orientation of the company is a key factor influencing its competitiveness and success in general. Businesses that are capable of properly systematically and quickly determine its strategic orientation, follows creating a significant competitive advantage. The ideal strategy is a balanced combination of value for customers, shareholders, employees and society.

## **Discussion and conclusions**

The paper complements and extends findings of Czech and foreign studies in this field. Competitiveness is a summary of strategic and tactical measures that lead to achieving a competitive advantage. Currently there is a need to learn and implement the requirements of future customers. Companies are trying to get as many competitive advantages as they can.

There are many factors of competitiveness divided into three main groups. These groups of factors include internal factors, environmental factors, in which the company operates and the personality of the owner or manager. Internal factors means for example human resources and diversity of goods offered. The external factors include including support by government agencies and by local public administration authorities.

Based on the semi structured interviews with the directors and executive officers of enterprises, theoretical background was confirmed. The most important factors in improving the competitiveness and performance management in enterprises are human resources, corporate culture, access to customers, quality and cost of production, innovative activity. The article suggests that the innovations are one of the best ways of increasing the competitiveness, because properly applied innovation can give companies a competitive advantage through cost savings and increased performance.

These findings can be used as a base point for further research, because there are limitations based on small research sample now. We couldn't avoid continuing on this never-ending topic. The next work could expand the research which will analyse factors in greater depth. For example, it could be used a quantitative approach (statistical analyses), which provides hard numbers useful in making business decisions and deciding between various projects.

On the other hand some new trends for improving competitiveness are formed – including marketing trends (guerrilla marketing, social networks, blogs) and IT trends (knowledge systems, integration platforms, business intelligence).

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## **INNOVATIVE DIGITAL COMMUNICATION OF SMALL AND MEDIUM WINE COMPANIES IN CZECH REPUBLIC, SLOVAKIA AND GERMANY**

**Lucia Coskun – Branislav Mišota – Jozef Chajdiak**

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### **Abstract**

**Purpose:** The study analyses how small and medium wine companies in three European countries (Czech Republic, Slovakia and Germany) proceed when building innovative digital communication mix. The aim of the paper is to compare the differences between the countries and companies. We tried to draft the possibilities of the open innovation in the marketing communication mix using digital channels.

**Design/methodology/approach:** To collect the data a questionnaire was used. The data from three European countries were collected: Czech Republic, Slovakia and Germany. The research joined 49 small and medium wine companies from more than 200 companies which were asked. At the sample of 49 companies differences between the countries were compared. Quantitative statistical research methods were used for the analysis.

**Findings:** Small and medium wine companies use the possibilities of smart and mobile devices very seldom. Usage of e-commerce applications in the digital communication mix is underestimated as well. This relates mostly to Slovak wine companies.

**Research/practical implications:** The paper drafts the open innovation usage possibilities of available software frameworks such as application programming interface (API) from the internet giants like Google for improvement of the digital marketing communication mix with minimal resources.

**Originality/value:** The main contribution of this paper is the analysis of small and medium wine companies and possibilities in the digital communication mix as well as a draft of the usage of the open innovation in their digital communication.

**Keywords:** Digital communication mix, Digital marketing, Small and medium wine companies, Open innovation

**JEL Codes:** M00, M30, M31

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## **Introduction**

The wine industry is facing several global challenges that are shaping the competitive environment (Contó et al., 2015). One of the challenges will be the case of tourism and movement of persons deploying SMART technology and innovation in the field of data (Bawa, et al., 2016). Research on marketing innovation is extremely wide and explores different aspects of the issue by adopting various approaches and perspectives (Contó et al., 2015). Literature illustrates that marketing innovation has been often examined as an issue related to other research issues and it has rarely been investigated as an isolated concept. The lack of specific studies in the wine industry and the difficulty in isolating marketing innovation from the other important variables under investigation has been very challenging (Contó et al., 2015).

Wine represents a set of family values, symbols, and traditions rooted in the area in which the family is based, and more so if the family has a good reputation in the market (Gallucci and Nave, 2012). Wine consumers in their 19 to 22 year-old segment are much more likely to choose wine, based on package features than product features, such as producer and country-of-origin (Elliot and Barth, 2012).

While the wine sector is not considered high-tech, many companies regularly develop a series of product, productive, commercial, and packaging innovations to actively respond to or modify customer demands (Toops, 2009).

Marketing innovation can be considered as a tool for maintaining competitive advantage and achieving growth (Chen, 2006). The European agro-food industry is dominated by small and medium enterprises (SMEs) that often lack resources and qualified personnel to invest in research and innovation, (Dries, 2014). SMEs are also increasingly joining the club of open-innovators, especially through industrial and knowledge-based clusters (Dries et al., 2013). A more open and collaborative interaction among food companies could be used to overcome those barriers and lead to higher rate of innovation (Dries et al. 2014). Looking at only internal, closed innovation processes in food companies is a misleading indicator of food companies' innovation capacity (Capitanio et al., 2010). Innovative marketing strategies should be combined with "exclusive" and "secret" recipes (Dries et al., 2014).

Open innovation activities can provide access to missing knowledge, reduce the costs of development, provide possibilities for risk sharing, and improve the product development process (Vrande et al., 2009).

The so-called Millennials is a generation that has been using computers and cell phones all of their lives (Nowak et al., 2008) and also generation Z (Kuprina et al., 2016). Study of Nowak examined the attitudes of Millennial wine consumers and tried to determine if positive

evaluations of the winery's web site lead to increased trust in the winery and perceptions of product quality, higher levels of brand equity, and increased purchase intentions.

A study of Italian wine industry shows Findings that the website quality is higher in e-commerce websites than in e-marketing websites, and that business revenue and the education level of managers have a positive influence on the websites' quality (Galati et al, 2016). The results of a Sicilian wine industry show that it is mainly small firms, in physical and economic terms, led by managers with a higher educational level, that have become more involved in SM as shown by high values of intensity, richness, and responsiveness. On the contrary, large companies' social-media efforts have been more modest (Galati et al, 2017).

This paper analyses small and medium wine companies and possibilities in the digital communication mix as well as a usage of the open innovation in their digital communication. It considers the role of the country of origin within wine companies.

## **1 Methodology**

As a starting point for our investigation our previous research was used (Coskun et al., 2016) (Coskun et al., 2015). The three-dimensional research framework Fig. 1 based on three dimensions was used and applied in our article on the wine market in three countries of the central Europe region (Czech Republic, Slovakia and Germany).

The methodology of this work is based on the collection of information from samples of wine companies from three European Union member states between 2015 and 2016. In the first step, the authors addressed 200 small and medium-sized wineries from the Central Europe region (Czech Republic, Slovakia and Germany). Determination of the wines addressed companies is beyond the scope of this work. Authors approached non-randomly 200 wine companies according to their capabilities and possibilities. In total 49 wine-producing companies actively replied from this sample of 200 companies addressed. This means that the answers to the selected questions meant self-sampling. These 49 companies represent a sample of all wineries. Since the determination of the sample was unrepresentative, the results of the statistical analysis are predestined only as a result of a set of 49 wineries and not the entire set of wineries in the Central Europe region (Czech Republic, Slovakia and Germany). The focus was on the analysis of the questionnaire responding 49 of the wineries.

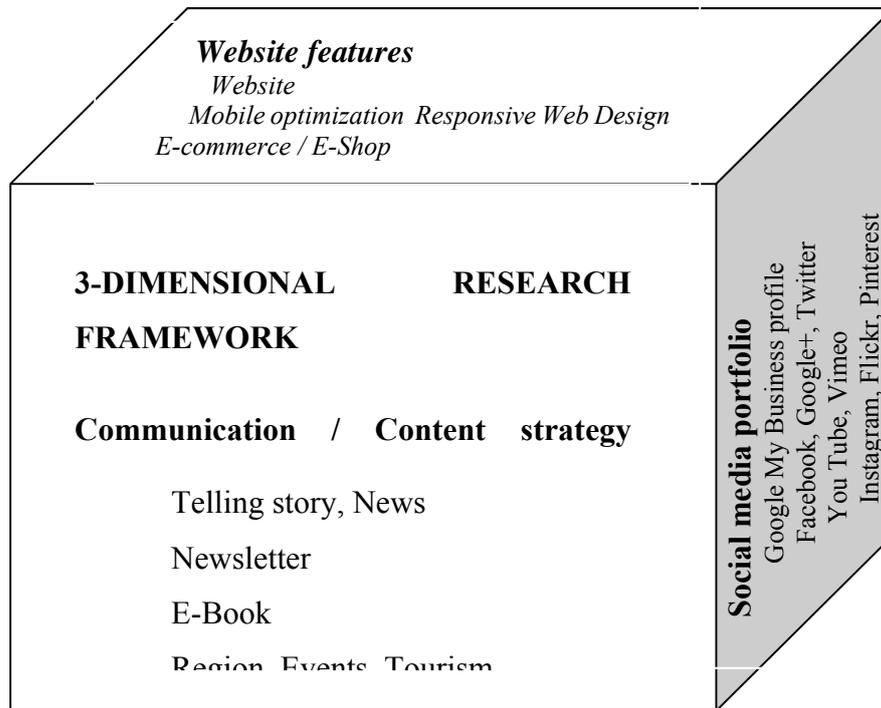
A questionnaire was used to collect the information. In our statistical survey, we evaluated the questionnaires completed by 49 wineries. 13 respondents from the Czech Republic (27%), 22 respondents from the Slovak Republic (45%) and 14 respondents from the

Federal Republic of Germany (29%) were from this sample. Mostly small wineries with a number of employees ranging from 0 to 24 were most represented in the questionnaire survey. From this group, there were 10 small wine-producing enterprises from the Czech Republic, 17 small wine-producing enterprises from the Slovak Republic and 10 small wine-producing enterprises from the Federal Republic of Germany. This means in total 37 small wine-producing enterprises i.e. almost 76% out of a total of 49 wine enterprises.

For our comparative study, we used the following components, which cover three categories for the assessment of how wineries in Czech Republic, Slovakia and Germany proceed when building a brand in the digital world: Website features, Social media portfolio and Communication strategy / Content strategy. In each of the selected three categories we chose the criteria to which it was possible for participating regional wineries to be evaluated by binary values.

On the basis of the questionnaire data obtained, we have divided these in the following three tables according to three categories for the evaluation of how wineries in the Czech Republic, Slovakia and Germany are proceeding when building a brand in the digital world: Website features, Social media portfolio and Communication strategy/Content strategy and membership of a particular country. In each of the three selected categories, we also selected criteria that could be evaluated by participating regional wineries through binary values for each of the three categories: Website Features, Social Media Portfolio and Communication strategy / Content strategy and for each of the participating wine company. On the basis of their totals, the following tables show the absolute abundances and the relative intensities of the use of the various components of the communication mix in the wine companies.

**Fig. 1: 3-Dimensional research framework**



Source: Own processing

In the category of *Web site features* the attributes „Website“ , „Mobile optimization / Responsive Web Design“ and „E-commerce / E-Shop “ were studied. In the category *Social media portfolio* the attributes „Google My Business profile“, „Facebook, Google+, Twitter“, „You Tube, Vimeo“ and „Istagram, Flickr, Pinterest“ and in the category *Communication/Content Strategy* the attributes „Telling story/News“, „Newsletter“ , „E-Book“, „Region, Events, Tourism“ and „Accommodation, Tasting room“ were studied.

To collect data a questionnaire survey was used. More than 200 wine companies from 3 European countries - Czech Republic, Slovakia and Germany were asked to infill the questionnaire. We have received answers from 49 wine companies.

In this sample 13 respondents were from Czech republic, 22 respondents from Slovakia and 14 respondents from Germany took part. In each of the selected three categories (Website features, Social media portfolio and Communication / Content Strategy), we chose those attributes that made it possible to evaluate when expressed as a binary value 1 (the company uses the appropriate attribute) or 0 (the company does not use the appropriate attribute). These values were calculated as a sum of the individual participating countries for each item. Absolute and relative frequencies of utilization of attributes for each of three categories: Website

Features, Social media portfolio and Communication / Content Strategy in wine companies were counted. See the data in the tables 1 to 3.

**Tab. 1: Website features**

Country	Czech Republic		Germany		Slovakia		SME Wine sector		Chi-Square test
	Absol.	Rel.(%)	Absol.	Rel.(%)	P value	Rel.(%)	Absol.	Rel.(%)	
<b>Website</b>	13	100,00%	14	100,00%	19	86,36%	46	93,88%	0,242
<b>Responsive Web Design</b>	5	38,46%	8	57,14%	7	31,82%	20	40,82%	0,345
<b>E-Shop</b>	8	61,54%	9	64,29%	3	13,64%	20	40,82%	0,002
<b>Sum of Firms</b>	13	100,00%	14	100,00%	22	100,00%	49	100,00%	

Source: Own processing

Evaluation of website features shows that less than 40% of Czech and Slovak wine companies use an own website optimized for mobile devices respectively use responsive web design. The usage of E-shops is extremely low in Slovak wine companies.

Results in the second evaluation category ‘Social media portfolio’ indicate that about 40% of Slovak wine companies do not have their Google My Business profile, respectively when building the brand do not use any of the social networks like Facebook, Google+ or Twitter.

The second investigated category is the Social media portfolio. For evaluation of this category, we selected items that are using various social media with digital branding. As individual metrics, we chose if participating regional wineries have their Google My Business profile. 4i use some of the most widely used social networking sites such as Facebook, Google+ or Twitter.

**Tab. 2: Social media portfolio**

Country	Czech Republic		Germany		Slovakia		SME Wine sector		Chi-Square test
	Absol.	Rel.(%)	Absol.	Rel.(%)	P value	Rel.(%)	Absol.	Rel.(%)	
<b>Google My Business profile</b>	10	76,92%	10	71,43%	13	59,09%	33	67,35%	0,545
<b>Facebook, Google+, Twitter</b>	10	76,92%	11	78,57%	14	63,64%	35	71,43%	0,562
<b>You Tube, Vimeo</b>	1	7,69%	2	14,29%	3	13,64%	6	12,24%	1,000
<b>Instagram, Flickr, Pinterest</b>	2	15,38%	0	0,00%	1	4,55%	3	6,12%	0,335
<b>Sum of Firms</b>	13	100,00%	14	100,00%	22	100,00%	49	100,00%	

Source: Own processing

Video channels on You Tube or Vimeo are used by wine companies seldom. Only small number of Czech and Slovak wine companies use the visual social media to build their brand.

In the category Communications / Content strategy, we selected items that we consider essential to understand what customers' value represents a particular wine company. It is therefore important to venture through telling a story what could, ideally, build and communicate emotional and utilitarian value of their products. In this category it is obvious that e-book is not used at all and only a few companies use Newsletters for the customers.

**Tab. 3: Communication / Content strategy**

Country	Czech Republic		Germany		Slovakia		SME Wine sector		Chi-Square test
	Absol	Rel.(%)	Absol	Rel.(%)	Absol	Rel.(%)	Absol.	Rel.(%)	
	.		.		.				Fisher's Exact Test Exact Sig. (2-sided)
<b>Telling story, News</b>	11	84,62%	14	100,00%	14	63,64%	39	79,59%	0,018
<b>Newsletter</b>	1	7,69%	3	21,43%	3	13,64%	7	14,29%	0,679
<b>E-Book</b>	0	0,00%	0	0,00%	0	0,00%	0	0,00%	-
<b>Region, Events, Tourism</b>	11	84,62%	7	50,00%	6	27,27%	24	48,98%	0,005
<b>Accommodation, Tasting room</b>	10	76,92%	11	78,57%	10	45,45%	31	63,27%	0,066
<b>Sum of Firms</b>	13	100,00%	14	100,00%	22	100,00%	49	100,00%	

Source: Own processing

For individual attributes of integrated digital marketing we have studied in individual countries if they are used with the same rate or if they are statistically significantly different. For each attribute, we compiled a 2x3 pivot table and counted the fisher exact test. P values of the test are given for individual attributes. In the case of E-Shop Telling story / News and Region / Events / Tourism we have obtained statistically significant results. For the Accommodation / Tasting room attribute is the test result at the limit of statistical significance. Other attributes vary significantly but not statistically significant. Concerning the E-Book attribute, we have not found that wine companies would not use this attribute in integrated digital marketing.

## 2 Discussion and conclusions

In a more detailed view, it is possible to identify some indicators where the relative abundance of use of the instrument in the communication mix is significantly lower in the integrated digital marketing of wine companies. From these lower values of the relative abundances of the respective tool in the communication mix a more significant impact on us have mainly two indicators. It is because a usage of these two indicators abilities in small and medium-sized wine

enterprises can be relatively easily increased by applying open innovation. In our case, it will be about open innovation using the available software frameworks of the digital marketing communication mix with minimal resources. The first indicator can be seen from the above baseline in the wine sector companies. It is obvious that in the integrated marketing on the internet, only 40.82% wine companies use e-commerce or some e-commerce solutions. The situation of the Slovak companies is even worse. Some of them use e-commerce solutions only 13.64% of the companies.

So we decided to deploy the selected small wine company in Slovakia, one of the available software e-commerce frameworks and dry and open source software. The high scalability of open source e-commerce platforms often results that such solutions can in a small wine company with simple administration while the low cost of implementation and operation be a suitable option of open innovation. Deploying open source e-commerce platform gives the customer the possibility of simple, trusted way for realizing its effective purchase transaction. Most of the open source e-commerce platforms uses the whole board of internet technology. In addition to HTML5 is especially CSS3, JavaScripts, PHP, JSON, Rest Full API, XML, and various other web frameworks like React and Redux from Facebook or Angular2 from Google.

Wine company, which uses e-commerce platform, must provide the customer a pleasant and helpful sales experience, providing an incentive for the buyer to purchase a reusable return customer. Sales promotion for this purpose can be achieved by a wine company with coupons, special offers and discounts. SME wine companies can also help link other websites and advertising affiliate programs. For the purpose of this work we decided to deploy the selected small wine company in Slovakia available software e-commerce platforms WooCommerce. WooCommerce is e-commercial open source add-on plugin for the open source content management system WordPress. It quickly gained popularity thanks to ease of installation and easy change of settings.

WordPress has open APIs for easy development and integration through REST API for example with its own Mobile Application. Content management system allows the development of custom solutions (add-on plugins) for measuring and displaying the performance of other business activities, using more sophisticated approaches (Grell & Hyránek 2012). Thanks to the possibility of supporting other open innovation.

From Table 3 - Communication is obvious that the wine sector companies show that within the Content strategy, only 14.29% of companies from SMEs wine sector has implemented newsletter. Newsletter is one of the best forms of digital communication and also the available means of building customer relationships. Striking is the fact that only 7.69%

Czech wine companies and 13.64% of Slovak wine companies who participated in our survey used newsletter actively. Even worse is the situation in the Slovak wine companies. As in the previous case, we decided to deploy in the selected small wine company in Slovakia, one of the available open source software such as the popular MailChimp, Reachmail, Benchmark, Elite Email, etc. as email marketing platform we decided to deploy MailChimp in a selected small Slovak wine company. MailChimp is the most Widely-used email marketing open source software for SMEs. Email marketing is fast, efficient, proactive, interactive, easily distributable form of digital communication. And since the newsletters requested by the beneficiaries themselves, their effect is unmatched by other forms of advertising. Newsletter is sent usually in HTML format, regularly sent to registered subscribers. Newsletter is a modern, low-cost and effective marketing tool. It reiterates the importance of communicating information and news. MailChimp is an email marketing open source software with simple administration while the low cost of implementation and operation. Deployment of MailChimp, however, may be advantageously used, for example when building a community. It is important that the newsletter provides useful information and contributes to the achievement of marketing objectives. MailChimp has for example huge integration list and integrates with content management system as for example WordPress, Drupal, Magento, Salesforce, etc. It is easy to integrate MailChimp with analytical tools like e.g. Google Analytics, etc. MailChimp makes it possible to view the actual email performance compared with past emails e.g. as graphs, reports etc.

For the wine to SME sector any of the available open source software e-commerce frameworks or an open source email marketing software is deployed. It is preferred mainly due to saving the costs of operation (e.g. in the case of e-commerce for SMEs wine company saving for rent retail space, salaries seller, etc.). Other advantages can be found in the easy collection of customer data, which can be very well used in digital marketing and also in the fact that such an easily distributable form of digital communication is much more attractive segment for millennials.

For the SME wine sector, some of the available open source e-commerce frameworks or as an open source email marketing software are deployed. Especially thanks to savings in operating costs (for example in the case of e-commerce there are also savings for rental vendors, salaries, etc.) for the SME wine company. Additional benefits can be found in the easy collection of customer data that can be used in digital marketing very well and also in the fact that this easy-to-use digital communication form is much more attractive to the millennials segment.

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## ORGANIZATIONAL DEVELOPMENT: CASE OF RETAIL ENTERPRISES STRUCTURE

Igor Denisov – Alexander Bobkov

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### Abstract

**Purpose:** The purpose of this study is to prove the repetition of the organizational structure changes of enterprises. From the point of view of our research objectives, such paired scientific concepts as vertical and horizontal; tall and flat; mechanical and organic can be considered as two basic types of organizational structures. The hypothesis of the authors is that these two types of structures dialectically replace each other, and qualitatively change in the process of enterprise growth. However, at the same time, these structures retain their defining properties of either serial or parallel at each new level of development.

**Design/methodology/approach:** The retail sector was chosen as the object of analysis as its structure can be characterized by separate retail points, allowing the use of statistical data processing. A common method for determining groups that combine objects that are homogeneous by certain criteria is cluster analysis. This is a means of exploratory analysis designed to naturally partition the initial data set into groups. To identify clusters, the computer program IBM SPSS Statistics was used. The analysis was carried out according to the data of retailers in the Czech Republic.

**Findings:** As a result of this analysis, six clusters were identified. By analyzing the average values of the variables in these clusters, four groups of trading organizations can be distinguished. The first group includes 1,105 small trade organizations, employing the smallest number of people (on average 5.4) and, for the most part, represents individual small shops. The second group (491 organizations) includes retail chains of small shops. The third group (70 organizations) includes fairly large individual stores such as supermarkets. Finally, the fourth group (29 organizations) includes large retail chains, employing on average more than 200 people and with over 23 outlets. Research/practical implications: The results of the cluster analysis as a whole confirm the hypothesis. But of course, this research should be considered only as a first step. To obtain more convincing proof for the alternation of successive and parallel organizational structures, a more in-depth study is required, which includes an analysis of the structure of specific organizations.

**Originality/value:** The results suggest that the general scheme of retail organization evolution can be categorized as universal, since the approaches underlying it can be used when taking into account the necessary features of retail organizations in any country or separate region with a market economy.

**Keywords:** Organizational structures, organizational development, cluster analysis

**JEL Codes:** D20, D22, L81

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## **Introduction**

In this article, we will try to show that the growth of commercial companies occurs in accordance with objectively determined patterns of evolution. One of these manifestations is a repeated succession of serial (vertical) and parallel (horizontal) organizational structures. This hypothesis was put forward in the scientific papers of the authors (Denisov and Bobkov, 2014), but so far it has not received wide scientific recognition.

J. Thompson, M. Zalds and W. Scott (2010) note that there are only three types of organizational structures, which are determined by basic production technology. The first type is "pooled interdependence", whereby individual elements of the organization are not related to one another, but each contributes "to the whole". Visually, such elements can be represented in the form of a parallel scheme. Another type of structure is "sequential interdependence", in which the input of one element is the output of the previous one. The schema in this case will look like a sequence of elements. The third type (of structure) is "reciprocal interdependence" of all elements from each other. According to J. O'Shaughnessy (2016) organizations with a structure of this type must incorporate the first two types of structure.

To prove our hypothesis, we will use the method of cluster analysis, which is widely used to determine relatively homogeneous groups (Capece, Cricelli, Pillo, & Levialedi, 2010) that combine elements with similar characteristics (Adusei & Awunyo-Vitor, 2014). In order to test the hypothesis of repeatability of changes in two basic types of structures, the retail sector was chosen, as organizational structures are often formed by individual enterprises (shops, supermarkets, superstores, etc.). We have chosen the retail sector of the Czech Republic as an object of research (Simova, 2010).

## **1 Model of evolution organizational structures of retailers**

In general, the activity of a retailer can be viewed as a production process, which includes purchasing, processing, storage and selling. In limited cases, this process is carried out by one person. The organizational, or in this case the production structure of such micro-firms can be considered as serial as most trade is over the counter (Denisov, 2016).

Once the limit of existing technological constraints is reached, the owner (and at the same time the only employee) of the firm will most likely have only one way to increase profits and reduce costs, which is the duplication of the main activity (the retail process). Only then is it possible to create a second-tier company. Its structure acquires the characteristics of a parallel system. J. O'Shaughnessy (2016), as an example of such an organization, leads "multiple

retailers" (multiple retailers). The limit of the quantitative growth in the number of units in this case is determined by the norm of controllability, which is usually in the range of 5-7 employees, but in some cases reaching up to 10 employees (Mintzberg, 2009).

For firms to reach the third level of development, a qualitative change in the field of retail technologies is necessary. The new firm should take advantage of the division of labor and the specialization of employees, approximately to the extent that they were described by A. Smith (1791). Thus, the organizational structure of such a firm again becomes serial. In retail, this means moving from a small store chain to a supermarket.

After achieving minimum costs and maximum productivity using the existing technologies of the third level, the company, in the process of its growth turns to the reproduction of business processes again. But in this case, it will be expressed not only in the hiring of additional staff, but in the expansion of its network of outlets. As a result, a fourth-level company develops, consisting of several supermarkets. This way of building capacity using existing technologies can continue until it reaches its limit again.

The logic of further development presupposes the transition from a firm of the fourth level of development (parallel structure) to a firm of the fifth level of development (serial structure). For example, this could be a large shopping center, such as MAKRO Cash & Carry ČR (in Russia - analog METRO C & C).

In our study, we will limit ourselves to the definition of the first four levels, since large companies may have a variety of legal forms for their units, which are not always taken into account in the data of parent companies and, therefore, cannot be taken into account in a standardized analysis. The organizational characteristics of each level of development are presented in Table 1.

**Tab. 1: Levels of development of retail trade organizations**

Level of development	Type of Trade Organization	The type of organizational structure
1	retailer/small shop	serial
2	a network of small shops	parallel
3	supermarket	serial
4	supermarket chain	parallel

Source: developed by the authors

## 2 Materials and methods

To confirm the hypothesis, we used a cluster analysis of retailers in the Czech Republic, using the IBM SPSS program. The initial data was obtained from the Albertina Gold Edition database (Bisnode Česká republika, as). For the study, 2,249 retail organizations were initially selected based on their business results for the year 2014 (from 01.01.2014 to 31.12.2014).

The year was chosen due to completeness of information. Based on the results of primary processing, 554 trade organizations were eliminated due to the lack of indicators necessary for the analysis. Financial indicators were calculated in the original currency of the country (Czech Koruna - CZK).

When conducting a cluster analysis, the following variables were initially selected as they characterize the activities of a particular organization:

- X 1 - number of Trading points;
- X 2 - the average Strength of all Employees (people);
- X 3 – the average number of employees in one outlet (people);
- X 4 - productivity of Labor by Added value (thousands CZK / person);
- X 5 - the value of Revenue attributable on a point of sale (thousand CZK.);
- X 6 - value Aggregate Asset (thousand. CZK).
- X 7 - the sum of Depreciation allocations (thousand. CZK).
- X 8 - age of Enterprise (full number years).

The calculation of the matrix of paired coefficients of Pearson's mutual conjugation shows that the age of the enterprise does not influence the economic performance indicators and is not related to the average number of employees. Due to this, the indicator was excluded from further analysis. It should be noted that the average age calculated from all organizations that fell into those clusters differed only slightly (14.0-15.5 years). This confirms the hypothesis that the age of the enterprise does not determine its belonging to a particular cluster.

**Tab. 2: Matrix paired coefficients mutual conjugation Pearson**

	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>
X <sub>1</sub>	1	0.788 **	0.060 **	0,026	0,023	0.797 **	0.769 **	0,018
X <sub>2</sub>	0.788 **	1	0.296 **	0,007	0.096 **	0.824 **	0.915 **	0,026
X <sub>3</sub>	0.060 **	0.296 **	1	0,042 *	0.580 **	0.134 **	0.200 **	0.039 **
X <sub>4</sub>	0,026	0,007	0,042 *	1	0.274 **	0,044 *	0,038	0,040
X <sub>5</sub>	0,023	0.096 **	0.580 **	0.274 **	1	0.092 **	0,082 **	0,037
X <sub>6</sub>	0.797 **	0.824 **	0.134 **	0,044 *	0.092 **	1	0,903	0.003 **
X <sub>7</sub>	0.769 **	0.915 **	0.200 **	0,038	0.082 **	0.903	1	0.012 **
X <sub>8</sub>	0,018	0,026	0.039 **	0,040	0,037	0.003 **	0.012 **	1

\* Correlation is significant at the 0.05 level (2-sides.).

\*\* Correlation is significant at the 0.01 level (2-sides.).

Source: calculated by the authors

Since the characteristics are equally informative and meaningful for further analysis, the distance between the objects was calculated by the formula of a simple Euclidean

distance:  $\rho_E(x_i, x_j) = \sqrt{\sum_{e=1}^k (x_{ie} - x_{je})^2}$  Where:  $x_{ie}, x_{je}$  - the value of  $e$   $i$ -th component of  $i$ -th ( $j$ -th) of the object ( $e = 1, 2, \dots, k$ ), ( $i, j = 1, 2, \dots, n$ ).

The cluster analysis was carried out by the method of Ward. This allowed us to break the population into a sufficient number of clusters, corresponding to the economic essence of the phenomena being studied. Due to different units of measurement, preliminary data standardization was carried out in the studied indicators. Objects with missing data were excluded from the analysis, as well as objects with anomalously high figures of added value and total assets against the background of other organizations. Accordingly, the cluster analysis was conducted on a sample of 1695 trade organizations.

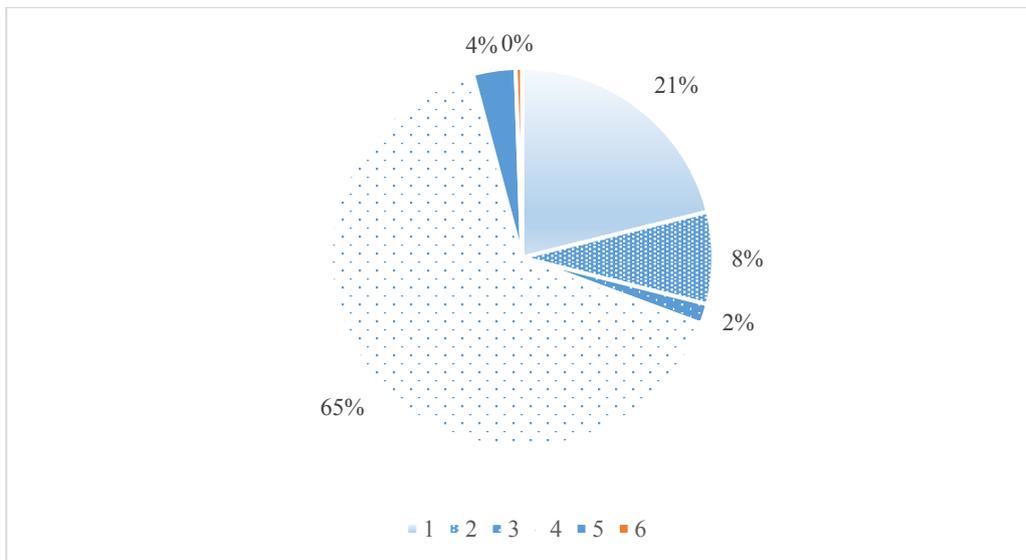
The hypothesis of dispersions equality inside and between clusters is rejected for all variables at 5 and 1689 degrees of freedom. The value of  $p$  is the probability of error when assuming the hypothesis of dispersion inequality is extremely low (no more than 0.001). The F-criterion is significant for all variables at a level of no less than 0.01. This allows us to say that the hypothesis of dispersion inequality is accepted and the clusters are formed correctly.

### 3 Results

The result of the cluster analysis was the breakdown of 1,695 retail organizations into 6 clusters. The overwhelming number of organizations came in four clusters (1105, or 65%). These organizations are characterized by the smallest (against the background of others) scale of

activity. The average number of employees in these organizations is 5.4 people, and the average headcount of staff in one outlet is only 3.2 people. On average the number of outlets is very small, between one and two. Accordingly, the values of economic indicators are lower against the background of other clusters: labor productivity is 318,000 CZK per year for one employee, while revenue is 5,079,600 CZK from one outlet. For organizations of this cluster, the lowest values of assets and depreciation charges are characteristic, which also indicates the scale of activity and the size of fixed assets.

**Fig. 1: Distribution of sales organizations by cluster**



Source: calculated by the authors

In terms of the number of objects, the chart is quite representative. Cluster 1 includes 358 trade organizations, the characteristics of which occupy 4th-5th place. They have a very small average number of employees and size of assets. On average, there are 2.4 outlets for each organization.

The leading position in performance indicators is occupied by organizations in clusters 3 (29 organizations) and 6 (9 organizations).

The nine organizations in cluster 6 display the highest values in terms of the aggregate of organizations indicators of labor productivity, revenue and average number of employees in one outlet. While there are significant aggregate assets and depreciation charges in the organizations of this cluster, it is placed third (29, 7 people) in terms of the average number of employees. Each organization accounts for an average of two outlets.

Cluster 3 includes 29 organizations. These organizations display the maximum values for number of employees and outlets as well as total assets, depreciation and amortization. In

terms of labor productivity and production size per trade point, these organizations occupy third place.

There are 61 organizations in cluster 5. They occupy an intermediate position in terms of economic activity indicators between clusters 3 and 6. These organizations are quite small in terms of the average number of employees and are characterized by not very significant indicators of assets and depreciation. At the same time, in terms of labor productivity and revenue per trade point, they occupy second place.

Cluster 2 includes 133 organizations. They occupy second place in terms of combined average number of employees and outlets. Here, the indicators of assets and depreciation charges are quite significant. However, the level of labor productivity and the volume of revenue per trade point is lower, occupying only fifth place.

The data analysis shows that labor productivity in trade organizations primarily depends on the amount of revenue per one trade point (Table 2). In turn, the amount of revenue attributable to a business is determined by the number of employees at the outlet. The total value of assets and the level of depreciation charges (indicators characterizing the scale of the organization) are primarily interrelated with the number of outlets in the organization and the average number of employees.

In general, by assessing the results of the cluster analysis, we can identify patterns of change in the indicator X1 (the number of outlets). If the results of the cluster allocation are sorted by the size of the total assets (X6), then we can see the sequential increase and decrease of the indicator values for the number of outlets (X1) (see Table 3). So, if in cluster 4, which includes small trade organizations (1,105 organizations), the average number of outlets is 1.8, in the next cluster (cluster 1 - 358 organizations) the average number of outlets has increased to 2.4. Further, in cluster 5 (61 organizations) the average number of outlets has decreased to 1.4. As we can see from Table 3, this regularity is preserved for subsequent clusters.

**Tab. 3: The average values of variables in the clusters, sorted in terms of the value of total assets**

cluster	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>
4 N = 1105	1.8	5.4	3.2	318.2	5 079.6	3 895.8	140.8
1 N = 358	2.4	13.5	6.8	556.1	20 393.4	13 868.8	432.2
5 N = 61	1.4	15.1	12.4	745.4	85 292.4	34 667.5	915.8
2 N = 133	8	42.7	7.7	534.1	20 085.6	54 027.0	1 806.6
6 N = 9	2	29.7	21.2	1 424.5	298 744.0	98 770.7	2 879.3
3 N = 29	23.2	214.5	11.5	566.2	38 054.2	204 094	7 617.2
Total / average N = 1695	2.8	14.1	4.9	410.9	14501.6	14 972.2	503.4

Source: calculated by the authors

The existence of such trends indirectly confirms the hypothesis of alternation between serial and parallel structure in the organization of production (operating).

Another factor that confirms this hypothesis is the extensive growth of organizations that have a parallel structure to their organization of production (operating) activities (indicator value amount of the revenue attributable to a single point of sale, the organization of the first and second clusters remains virtually unchanged). It is also slightly different to the value of the average number of employees in one outlet. That is, organizations belonging to the first and the second cluster have comparable specific indicators but substantially differ only in the number of outlets.

Despite their significant differences, when comparing the average values of the fifth and sixth clusters, it is likely that the store type is fairly large (supermarket). When analyzing the figures for the average number of employees in one outlet (X<sub>3</sub>) of these organizations, there is a substantial growth of its absolute value. However, the estimated number of outlets (if you calculate it by the average number of X<sub>2</sub> / X<sub>3</sub>) has slightly changed.

## Conclusion

The results of the cluster analysis generally confirm the hypothesis. It is evident from the average values of the variables in the clusters, that the size of organizations (X<sub>6</sub>) shows a unique successive change from the number of retail outlets (X<sub>1</sub>). At the same time, when analyzing the results obtained from the position of the hypothesis, it can be assumed that the organizations

included in the first and the second clusters are a network of small shops. And, it is most likely, that you should be assigned to the same cluster. This confirms that the value of the index is almost identical X5 (the value of revenue per one point of sale) for these trade organizations.

It can also be assumed that members of the fifth and sixth clusters are supermarkets. The largest supermarkets make up the sixth cluster (9 companies).

Finally, the large supermarket chains, with an average of 23 outlets or more, appear in the third cluster. The number of employees in one outlet for such organizations is comparable to that of the fifth cluster organizations (individual supermarkets). Overall, the comparison of analysis results and the hypothesis can be presented in the following table.

**Tab. 4: Comparison of analysis results with the hypothesis**

Cluster number	The number of trade organizations	Type of Trade Organization	The type of organizational structure
4	1 105	retailer/small shop	serial
1	491	a network of small shops	parallel
2			
5	70	supermarket	serial
6			
3	29	supermarket chain	parallel

Source: calculated by the authors

Of course, our study should be considered only as a first step. Further and more convincing evidence of alternation of serial and parallel organizational structure requires more in-depth studies, including analysis of the structure of specific organizations. Therefore, the next stage of the study, which could confirm our hypothesis, would require a study of several organizations at each level of development. A representative sample of commercial organizations and a comprehensive analysis of their organizational structure would also be required.

Nevertheless, these results suggest that the general scheme of the evolution of retail trade organization can be represented as universal, as the approaches on which it is based, can be used with the necessary features for retail organizations in any country or a particular region with a market economy. In practice, if companies knew the cluster to which they belonged, they would be able to uniquely select a direction for further structural development, consistent with other internal and external factors and guided by their own objectives. Regulatory agencies for economic development could use this clustering technique to assess current situations and determine development methods and strategies to promote acceleration of retail trade organizations in a region or country as a whole.

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## THE ROLE OF GLOBAL CITIES IN CREATION OF INNOVATIVE INDUSTRY SECTORS. CASE STUDY – LIFE SCIENCES SECTOR

Slawomir Dorocki – Piotr Raźniak – Anna Winiarczyk-Raźniak, – Marta Boguś

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### Abstract

**Purpose:** The purpose of this article is to analyse the location of the life sciences industry as an example of the innovation industry in global cities and the role of cities as centers of innovation and progress. Two of the most developed sectors of the life science: biotechnology and pharmacy were analyzed. The analysis made an attempt on identification the most important factors which have influence on the development of the innovative sectors in the cities. The study was based on the detailed analysis of two cities with the highest global development index of the life sciences: New York and Basel.

**Design/methodology/approach:** Research based on the *The EU Industrial R&D Investment Scoreboard*. Determination of the most innovative cities of the LS sector in 2015/2016 was possible thanks to *Potential Index of Life Sciences (PILS)*. It is based on the standardized values of the total R&D value in the city, the average value per company, year growth of R&D expenditures for companies and number of companies in the city. In the research, the case study of the two most innovative cities in the life sciences sector was used.

**Findings:** The greatest agglomerations are particularly important in the development of innovative industries which have well-developed scientific and research functions apart from their industrial functions. This is caused by a strong connection with the scientific background and human resources as well as greater availability of capital through a dense network of informal contacts on the science-industry line. As our research shows, LF industry is growing in metropolitan areas like NY, London, Tokyo and Paris, as well as smaller centers like Basel, Leverkusen, Athlone, and Hamilton. The common feature in these areas is the presence of research centers and educational institutions forming industrial clusters.

**Research/practical implications:** The analysis of the importance of the cities for the development of innovative industries allows to understand the meaning of the factors influencing the innovativeness of the industry. In the future, it will be possible, to determine the role of cities, including global cities in the model of development of the innovative industries in the world. It allows for spatial analysis of the phenomenon.

**Originality/value:** The subject of the life sciences industry development and the role of the cities was usually taken in the aspect of the World City Network. The following, detailed analysis may complement the published data of the official reviews and the role of the innovation in the so-called global cities.

**Keywords:** life science; biotechnology; pharmacy; innovation; global cities

**JEL Codes:** F02, G03

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## **Introduction**

The global life sciences industry has changed dramatically over the past ten years. It can be further divided into three subsectors: pharmaceutical, medical technology and biotechnology. While big pharmaceutical companies see their sales revenue decline, biotechnology and specialty pharma companies enjoys fast growth. Therefore, in the following discussion, the authors focused on the analysis of the two most important sectors of the innovative industry: biotechnology and pharmacy (Owen-Smith et al. 2002).

Nowadays, life science (LS) industry, is regarded as the most significant and the fastest developing sector of innovative economy. The industry is characterized by innovation, a wide range of applications and generation of progress in other areas of basic science with strong interrelation with research centres. Therefore, the development of LS occurs usually in global cities with the academic and research facilities as well as adequate human resources (Powell, Owen-Smith 1988). An important element of the LS industry is the commercialization of research and enterprises' development based on spin-off partnership. The significant factor of the innovation's development is the ability of getting capital for the high-risk investments (Booth, Salehizadeh 2011).

The analysis will be carried out in the context of globalization and the relocation of industries in the world. The purpose of the article is the analysis of location of the biotechnology and pharmacy industry (Head Quarters) as an example of the innovative industry sector in global cities and their role as the centres of innovation and development. The development of innovative industry is closely linked with the level of socio-economic development of the countries, while its spatial differentiation refers to the settlement network. The important role in the development of innovative industry sectors is played by the largest agglomerations which perform industrial, scientific and research functions (location of universities and research centres) (Lever 2016). Despite the globalization process and internationalization of industrial production, the innovative industry is not decentralized and has a large inertia. It is connected with a strong link with research facilities and human and capital resources as well as a network of informal contacts between science and industry (Owen-Smith et al. 2002).

At present, it is assumed that economic regional development is closely related to development of innovation and technological progress in a region. Innovation and innovation-related economic competitiveness of local administrative units at all levels is predominantly dependent on the human capital (Karlsson, Börje 2008). Currently, innovation is a factor of the competitiveness and success of the enterprise (McAdam and Keogh, 2004). New technologies offer also many opportunities that simultaneously affect a change in human resource

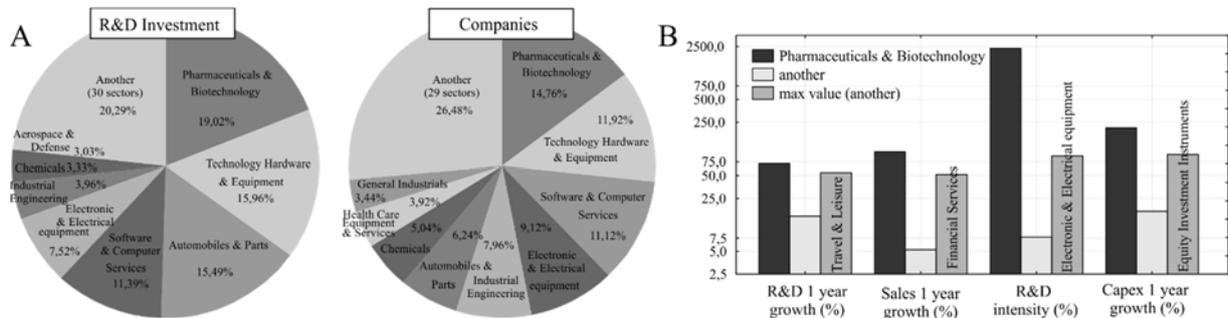
management (Danzon Keuffel 2016). In addition, innovative economy is reflected in the types of growing businesses and the R&D base. In the industrialisation period science, especially chemistry and physics as well as traditional industry played the key role in the economic growth (Blumenthal et al. 1996) The end of 20th century brought the dominance of mathematics sciences (including the applied mathematics) and the IT as well as of the electronic industry (the IT revolution). At present, life sciences is considered as one of the most important branches of science (Bauer 1995). The knowledge-based economy accelerates the process of globalization and the development of strategic economic sectors. In the 21st century, this process has grown considerably by developing transnational corporations, mainly located in large cities (Raźniak et. al 2017).

## **1 Life science industry in the world**

The global importance of life sciences industry in the development of the world's economy is confirmed by the analysis of R&D expenditures incurred in the years 2015/16 by the 2500 most innovative companies in the world and the number of companies in the biotech and pharma sector (fig.1A). In both cases, LS's is inferior to the combined sector of IT Harriers & Equipment and software & computer services. Even more pronounced dominance of LS is observed in comparison with growth rates of R&D spending, sales and capex value relatively to the previous year as well as R&D intensity (fig.1B).

After the global crisis, in 2012 LS's sector increased. Companies of the LS sector that require high capital investment and were burdened with a high risk during the financial crisis were particularly vulnerable to falling investor interest. However, changes in the size of investment in LS sector were varied in different countries in the world. There was a strong US advantage over other countries considering the size of investment in R&D in the biotech and pharma sector. In 2016 62,000 mln € was invested in 199 biotech-pharm companies. The next country with the highest potential was Switzerland, where 10 companies invested 18.372 mln €. This puts the country in the first place in the average number of investments per company (whereas in the US only 311.55 mln €). However, only the most innovative companies were analysed, which may affect the average value.

**Fig. 1: Share of expenditures of R&D and companies (1A) according to sectors and average value of chosen indexes of the development and innovation of biotech & pharma sector regarding value of the indexes of the other sectors of 2500 the most innovative companies (1B) in 2015 and 2016.**



Source: own elaboration based on *The EU Industrial R&D Investment Scoreboard 2015, 2016*

The other countries with a high level of investment in the LS sector (about 10 thous. mln €) were the UK, Japan and Germany and France (about 6 mln €). However, in those countries there was very little investment growth. Since 2009, US had 87% growth, Switzerland 52% and Japan 12%. Only in Germany the growth exceeded 100%, reaching 150%. The drop was mainly recorded by European countries: Luxembourg (-90%), Portugal (-44%) and Sweden (-22). In this period, the leaders were South Korea (1568%) and Ireland (1245%). India (593%), The Netherlands and Canada (about 300%) also recorded high values. The leaders were also China and Israel, which had a second rank after Switzerland in R&D investment (1400 mln €). Analyzing the distribution of innovative cities by R&D spending in the life sciences sector, the New York (NY) agglomeration had 33245.0 (mln €) and Basel had 18103.4 (mln €). The cities in the range between 5 to 10 (mln €) are concentrated on the east coast of the USA and in Western Europe. Large outlays are correlated in two cases with a large number of companies operating in the LS sector, such as NY, which has 39 companies and Boston 37. This uneven distribution of companies and R&D investment is caused by high spending on research in companies located in European cities and peripheral cities in the US, where often a strong position is determined by the location of one corporation. Taking into consideration the average R&D expenditures for a company in 2015/2016, leading cities were Basel with 4525.8 (mln €), Leverkusen 4436.0, Indianapolis 3663.3 and Thousand Oaks (LA) 3619.9 (tab.1).

**Tab. 1: Cities with the highest indexes of the innovation level by The EU Industrial R&D Investment Scoreboard in years 2015/2016)**

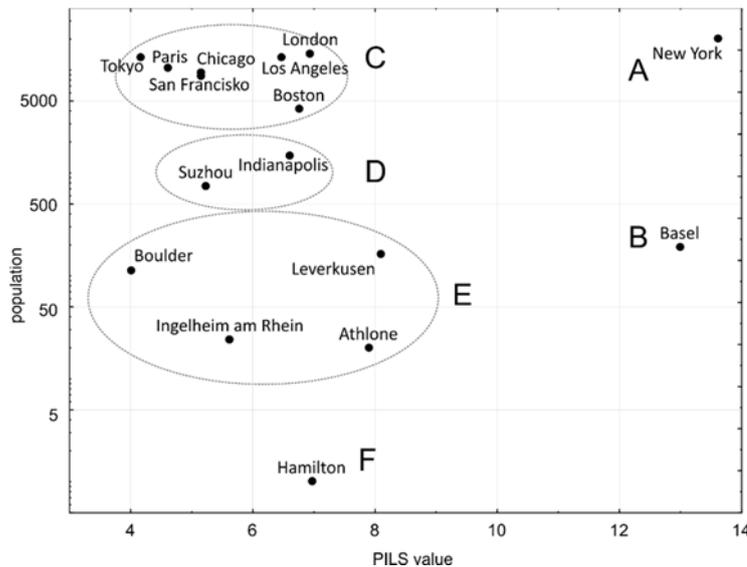
companies			R&D 2015/16 (mln €)			R&D 2015/16 (mln €)/companion		
city	country	value	city	country	value	city	country	value
NY	US	39	NY	US	33245.00	Basel	Switzerland	4525.86
Boston	US	37	Basel	Switzerland	18103.46	Leverkusen	Germany	4436.00
San Diego	US	20	London	UK	9705.49	Indianapolis	US	3663.36
S.Francisco	US	11	Paris	France	5614.53	Thousand Oaks (LA)	US	3619.92
Tokyo	Japan	10	Chicago	US	5248.65	Ingelheim am Rhein	Germany	3004.00

Source: own elaboration based on The EU Industrial R&D Investment Scoreboard 215, 2016

To find the most innovative cities of the LS sector in 2015/2016 there the index for the particular agglomerations was created (*Potential Index of Life Sciences PILS*) (1). It is based on the standardized values of the total R&D value (in mln €) ( $z$ ) in the city, the average value per 1 company ( $a$ ) and 1 year growth (%) of R&D expenditures ( $y$ ) in the particular companies in the agglomerations. In addition, the logarithmic number of companies in the city was taking into consideration ( $i$ ). To get rid of negative values, the absolute value of the smallest index was added to the all results. The effect was scales from 0 to 13.6.

$$PILS = \log(i) + \sum_{i=1}^n z_i + a_i + y_i \quad (1)$$

**Fig. 2: Average value of PILS Index in the chosen cities in years 2015/2016**



Source: own elaboration based on The EU Industrial R&D Investment Scoreboard 2015, 2016

The cities with the highest development index (index above 5) LS were analysed in details. These are 16 out of 167 cities (fig. 3A). They are the global LS industry development centres. This group included cities of various sizes and functions. Therefore, they were divided

into types: A - super multi-sector cities, B - centres of life sciences, C - centres of life sciences in multisectoral cities, D - multi - sectoral industrial centres, E - mono or polysectoral centres of innovation, F – centres of strategic geographical location, Economic or political (fig. 2).

## **2 New York and Basel. Case study**

In the next part of the article, further analysis of the two global centers of life sciences industry was carried out which helped to identify the main factors influencing the development of this sector. As the case study, two cities with the highest PILS score were selected: New York and Basel. Both centres had a high growth rate in the LS sector but while in Basel steady growth was noted, in NY there was a decline. Historically, NY was a leader in the field of natural sciences and the LS industry but nowadays there is lag in the development in comparison to Massachusetts and California centres. This is evident of the increase of employment and the attractiveness for capital investments. In 2015, Massachusetts generated 1,32 USD of risk capital in LS sector per 1,00 USD raised from federal NIH funds, while NY generated 0,06 USD (New York's Next Big Industry: Commercial Life Sciences 2016, Life Sciences Industry Outlook 2017). NY's major strength in the life sciences development includes Academic Institutions (First Avenue Medical Corridor in Manhattan), proximity to pharmaceutical companies (Big Pharma, Bayer, Bristol Myers, Johnson & Johnson, Merck, Novartis and Pfizer), New Real Estate Entrants (Alexandria Real Estate Equities), disease-focused foundations and early stage funding ("Silicon Alley"), small but growing number of successful life sciences companies and specialized Professional. However, the main slowing down factor of the LS sector in NY is mainly the lack of adequate and inexpensive laboratory space. The key barrier for the development of natural sciences is the lack of interest of real estate investments. Security and authorization requirements and connected with them high costs are barriers for market development of the LS infrastructure. Therefore, the support of the city's authorities to provide the hard infrastructure (as it was in Massachusetts during industrial revitalization) is necessary, through financial relief and legal aid. Another problem is getting a venture capital with long growth dates. Therefore, it is important to undertake coordinated efforts to cover short-term "plug and play" needs for new businesses. In addition, state and state governments such as Atlanta, Cleveland, Florida and Texas offer low-cost start-ups. The high cost of living and running business (business taxes and a lack of solid, repayable research income tax) in NY makes companies find different places. In opposite to California and Massachusetts, NY researchers cannot get benefits from well-functioning business incubators

supporting the so-called entrepreneurship culture. At the same time in NY there is no middle qualified employees. While the Massachusetts Life Sciences Centre offers scholarships and grants for students which positively affects the employment structure. Another problem is opined that LS sector is very risky and ethically controversial by many investors. In addition, the lack of investment in LS science causes the inhibition in related sectors such as IT and chemistry, for example computational biology and medical and laboratory equipment. Because of that, the important thing is to build a life sciences cluster that gathers and connects private and public institutions and coordinates joint activities. Nowadays, the LS sector in NY is very fragmented, companies often compete and rarely cooperate. However, the actions of the companies cannot be taken without support of local authorities with financial and legal tools.

The Life Sciences in Basel region has a long tradition in chemical and pharmaceutical industry. In the 18th century the silk dyeing industry developed, which was the begging of leading chemical companies of the nineteenth century. One of the main reasons of setting up the chemical industry was the location of the region in the centre of Europe and proximity of Rhine River. In recent decades, the chemical and pharmaceutical industries have evolved into a cluster of science based on knowledge. There are located about 600 companies with an annual turnover of about 100 billion € and profit about 20 billion € (Life Sciences Outlook Switzerland . 2015).

Basel is famous for two of the world's leading pharmaceutical companies, Novartis and Hoffmann-La Roche. What is more, Basel is the base of many other leading Life Sciences and related businesses: Syngenta's global agribusiness business, Ciba and Clariant, and Straumann and Synthes. In recent years, many other global companies have also invested in the Basel region: Huntsman Advanced Materials, BASF, Bayer Consumer Care, etc. Therefore, life science is dominates in economic structure of the region. The natural sciences industry generated 18% of the share of added value in the Basel region and noted the highest growth among all regional industries. In this way the Life Sciences industry shapes the economic structure of Basel. Activities related to creation of knowledge and it's transfer are supported by regional institutions, for example, Biozentrum is a part of the University of Basel, the Friedrich Miescher Institute (part of the Novartis Research Foundation). The progress of the regional knowledge and educational infrastructure is supported by a constant interaction of policy, business and science. Corporations are directly supported by regional knowledge institutions (University of Basel, regional hospitals). Innovation, knowledge understanding, good practice and shared values are base in relations between companies and a region. The main mechanisms are innovation networks based on formal and non-formal cooperation, particularly in the

pharmaceutical sub-sector and various (open) innovation strategies of leading companies in the Basel region. Typical for that region is "whole chain of culture," which means that the entire innovation chain of the life science industry (basic research, clinical research, marketing and sales) and all necessary support functions (Financial Services, Suppliers) are meet in the region and closely related.

The "Whole Culture" is based on the regional innovation chains of the leading LS companies and the learning processes of all the participants involved in this structure. In addition, there is a significant exchange of workforce between enterprises, so the so-called common knowledge. Leading regional companies support the further development of innovation networks. In the process of innovation, a critical discovery can happen "everywhere," but further discoveries depend on product testing in laboratories and then in hospitals. Furthermore, the approval procedure is continued through a dialogue with the institutions. Therefore, the region needs "unbelievable knowledge" to fulfil the requirements of the entire innovation process. The development of LS sector in Basel is noticeable in urban planning, where LS investments are a part of a town, not isolated or peripheral. That is why the LS industry has the highest performance in all Swiss industries: the employee generates average 626000 swiss francs a year (Pharmaceutical Hub Switzerland Espace Lémanique, 2015). It is about four times as much as productivity than in the whole economy. This productivity is connected with the high intensity of research and specialized production processes. In the time of globalization, companies more and more often base their decisions on immeasurable factors such as educational possibilities, access to facilities. The pharmaceutical innovation industry requires an extensive range of specialized employees, whether they are scientists, engineers, IT specialists or marketing specialists. They are very mobile and make decisions about the place of work and living in the attractiveness of business location. The property market in Basel region is one of the three largest in Switzerland and it is considered exceptionally stable. On the contrary to many other resorts, the region offers a wide range of workspaces at reasonable prices. This applies to offices, commercial premises and laboratories as well as to storage and production and construction areas. It can be stated that in Basel – opposite to NY there is the "spirit of life sciences" created by public and private institutions. A cluster of natural sciences based on tradition and common values has been established.

## Conclusion

According to the adopted life science industry growth rate there are two cities distinguished: New York (13.61) and Basel (12.99). These are the world's centers of the development of innovative economy sectors. In such cities as Leverkusen (8.09), Athlone (7.90) or Hamilton (6.96), the location of the industrial plants influenced the formation of life sciences, mainly from R&D.

It should be noted that the innovation industry is strongly linked to the global metropolis. However, the development of innovative sectors does not determine the size of the city but its infrastructure. The innovation industry, represented in the above article by the LS sector, is concentrated in cities with academic centres and research institutions. Other development factors are large international corporations and a network of links and cooperation with other companies and institutions. Other important factors are: local government policy, financial and legal support for innovative companies as well as accessibility and cost of space for investments.

The location of companies is determined by living environment for highly qualified staff and so-called "spirit of the place," with coordinated actions in all fields of innovative projects and creation of the production clusters. Which exist either through the benefits of scale (big metropolis), local government policy or large corporations. Another important factor for the development of the LS sector is the legal conditions and restrictions on the sale of products such as medicines, so often the location of the production is linked with the place of distribution of the products. The hypothesis on the impact of global cities on the new investment sector should be reaffirmed but it is important to point out that the development of this economy sector is largely determined by the intellectual potential and cross-sectoral network.

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## KEY COMPETENCIES IN SUSTAINABILITY: ASSESSMENT OF SELECTED ACADEMIC PROGRAMMES IN MANAGEMENT

Nataliya Dubrovskaya - Felipe Martinez

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### Abstract

**Purpose:** This paper presents the review of the extent to which sustainability-related courses are included in business and management education curricula at selected Higher Educational Institutions (HEI) in the Czech Republic. It demonstrates how HEIs incorporate sustainability issues into preparation of future managers.

**Design/methodology/approach:** The paper research design is qualitative analysis of business and management curricula. It is based on the investigation of courses that names are directly connected to sustainability (Palma et al., 2011). Courses mentioned in the study plan are reviewed. This paper considers curricula of public universities in the Czech Republic that offer accredited programmes in business and management. It explores curricula of academic programmes in business and management at HEIs as a preliminary reference for the research. The results provide insights for further quantitative and qualitative research.

**Findings:** Of 14 public universities that offer “Business Economics and Management” specialization of “Economics and Management” programmes, 6 universities (around 43%) include sustainability-related courses into their curricula. Most of these courses (56%) are elective, compulsory optional courses take 38% and the rest 6% is compulsory. These courses include sustainability management, corporate social responsibility (CSR), sustainable development, environmental impact assessment (basics) and some other subjects.

**Research/practical implications:** The paper provides evidence for representation of sustainability-related courses in business and management programmes. However, the present study has lack of confirmation if students graduate with sustainability capabilities. The key competencies in sustainability (KCS) framework (Wiek et al., 2011) supports implementation of sustainability-related courses into academic programmes that prepare future managers. The further research will explore competencies that sustainability-related courses form.

**Originality/value:** This research demonstrates the HEI attention to sustainability courses in programmes that focused on economic pillar of sustainable development. The paper contributes to HEI programmes development by suggesting the possible way of including sustainability competencies into non-sustainability oriented programmes.

**Keywords:** Higher Education, Sustainability, Competencies

**JEL Codes:** I23, M10

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## **Introduction**

Sustainability becomes an integral part of companies (Baumgartner and Winter, 2014). Managers integrate sustainable development principles into business. Their knowledge comprises society and environment within their decisions and activities (Rake and Grayson, 2009). Identification and awareness on sustainability issues in decision-making process challenges the management discipline due to the lack of knowledge in this area. Therefore, it is necessary for business and management education to include issues of sustainability into academic programmes. Chalkley (2006) stands that “higher education’s most valuable contribution to sustainability lies in providing large numbers of graduates with the knowledge, skills and values that will enable business, government and society as a whole to progress towards more sustainable ways of living and working” (p.235).

This paper investigates the inclusion of sustainability courses into bachelor business and management programmes at the university level. Universities in the Czech Republic comprise an excellent example of diversity of knowledge within a rather small number of institutions. Therefore, the development of this methodology with this amount of institutions creates an assessment system easy to replicate for other future researches in different countries with larger amount of higher educational institutions. The paper also suggests using key competencies in sustainability (KCS) such as systems-thinking competence, anticipatory competence, normative competence, strategic competence and interpersonal competence (Wiek et al., 2011) as a guideline to implement sustainability courses and topics to the current business and management curricula. It also suggests possible programme changes under the same framework.

## **1 Sustainability Competencies in Higher Business and Management Education**

Higher education has a great influence on sustainability promotion (Stephens et al., 2008). Sustainability issues should be considered in business and management academic programmes as well as in environmental or ecological programmes to prepare managers that understand how to meet business, social and environmental requirements at the same time. However, most business courses focus on the economic part and do not offer students to look at business from other perspectives (Waddock, 2007). It is a challenge to find the way how to graduate ‘sustainability literate’ students (Chalkley, 2006).

After passing the course or completing the whole academic programme students will possess some specific competencies. Gijbels (2011) considers broad and narrow ways of competence description. In a wide sense competence contains knowledge, skills, attitudes, social and motivational aspects connected with work environment. In the narrow sense competence relate to “the result of an individual learning process including cognitive skills and knowledge” (Gijbels, 2011, p. 382).

Education for sustainability is aimed at three main outcomes: students’ knowledge, skills and emotional attributes that enable them to act and behave sustainably (Shephard, 2008). Wiek et al. (2011) define competencies in sustainability as “complexes of knowledge, skills, and attitudes that enable successful task performance and problem solving with respect to real-world sustainability problems, challenges, and opportunities” (p.204). Wiek et al. (2011) distinguish five KCS on the base of existed information about the list of competencies needed for sustainable education that occurred in the literature within 20 years. These five competencies are combined within one framework for sustainability problem-solving and research. KCS are systems-thinking competence, anticipatory competence, normative competence, strategic competence and interpersonal competence. Systems-thinking competence means the ability to understand cause and effect relationships of sustainability issues, the ability to analyze complex systems in different scales and from different aspects. Anticipatory competence means the ability to analyze and estimate future possible results and situations within sustainability frameworks. Normative competence means the ability to define clearly sustainability values, principles, goals and objectives. Strategic competence means the ability to implement strategies towards sustainability and also plan necessary actions for improvements. Interpersonal competence means the ability to motivate, engage, involve and facilitate to pay more attention and solve sustainability problems.

KCS are essential for sustainability programmes and they are not the focus of other programmes. However, to connect managers’ capabilities with sustainability KCS may be used as an orienteer. Considering the main business specialization and time limit, it is not necessary for management students to acquire all these competences in-depth. The sufficient level should be specified in the programme. However, the presence of all these competences with the predetermined level of development may become a good platform of sustainability awareness for future decision-makers.

Moreover, there is a divergence between university and other stakeholders’ perception of the importance of sustainable practices implementation into business curriculum (Barber et al., 2014). The companies and their suppliers have their own understanding about sustainability

and the academia also has its own. Therefore, combination of these sources of knowledge creates an open innovation programme that facilitates the learning and application of sustainability.

University of New Hampshire (UNH) (Durham, New Hampshire, USA) illustrates a complex successful implementation of sustainability knowledge into business curricula (Barber et al., 2014). This is an internationally recognized university in sustainability, which received “the Sustainability Tracking, Assessment and Rating System (STARS) rating of Gold in 2011” (Barber et al., 2014, p.481). Despite some limitations, several innovative sustainability-related business curriculum initiatives have been presented at UNH. For instance, one of the programmes, Green Launching Pad, brings together starting sustainable entrepreneurs, faculty members and students to share skills and knowledge to help new businesses with usual start-up questions. This programme has demonstrated successful results and within two years 14 start-up green technology or manufacturing companies have been commercialized and enlarged.

At the same time business needs should be considered at the level of student competencies. “Employable” sustainability-related capabilities that employers expect should be incorporated in programmes (Thomas and Day, 2014).

## **2 Methodology**

This paper investigates how deep sustainability issues are incorporated to management and business curricula. First, public universities in the Czech Republic are identified. Second, universities that offer accredited full-time bachelor business and management programmes in the Czech language are distinguished. Bachelor programmes are chosen because a lot of students start working after getting bachelor degree and some of them start running their own businesses. Third, curricula for these programmes are analyzed based on the information from the universities’ websites. Analysis includes sustainability-related courses. It is checked if courses names contain words “sustainability”, “environment”, “ecology”, “social responsibility”, “waste management” or some modifications of these words. Similar methodology is used by Palma et al. (2011) to distinguish number of courses associated with sustainability in bachelor business administration programmes in Brazilian federal universities. This paper covers the analysis of business and management academic programmes that prepare future managers. The paper considers curricula available on the websites of the HEIs for 2016/2017 academic year to display the actual situation.

### **3 Findings**

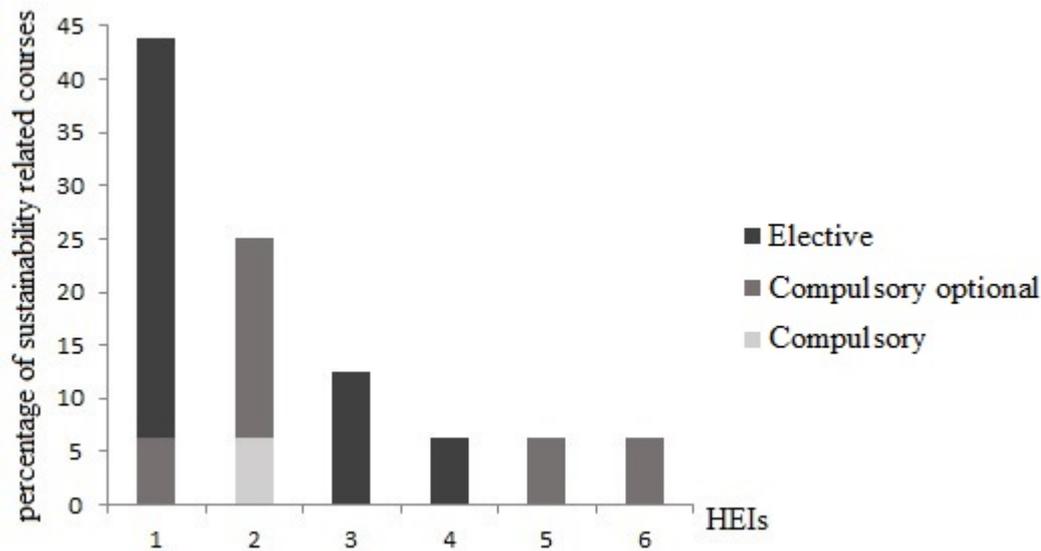
There are 26 public higher educational institutions in the Czech Republic. 17 of them offer “Economics and Management” programmes, it is around 65%. All of these programmes have the accreditation at the current moment. Moreover, some academic programmes offer several fields of study. This paper investigates “Business Economics and Management” specialization that prepares professionals with the main focus on management of the company. 14 academic programmes provide this field of study which names slightly vary as following: “Economics and Management”, “Management and Business Economics”, “Business Administration”, “Business Administration and Management”, “Business Economics” and “Corporate Economics and Management”. The paper analyses sustainability-related courses mentioned in the study plan and in a special list of courses if it is linked with this plan or academic programme. Of 14 universities, 6 offer courses related to sustainability (fig.1).

The curriculum of the programme usually consists of compulsory, compulsory optional and elective courses. Compulsory courses take the biggest part of study. Elective courses sometimes may be chosen directly from the list of courses in the study plan, from a separate list available on the university’s website or even from any other fields of study. This paper considers just the information from available list of courses within the study plans of academic programmes and from the list of elective courses that linked with the study plans.

A preliminary overview of the study plans shows that business economics and management specialization programmes provide the opportunity for future managers to learn some aspects related to sustainability. 43% of business economics and management specialization study plans include sustainability-related courses.

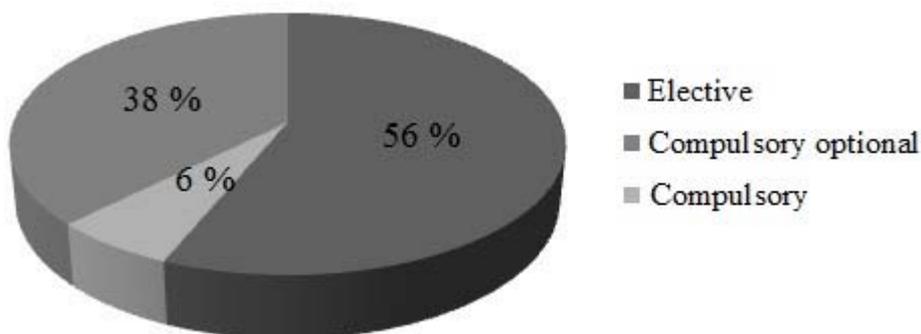
However, most of these courses around 56% are elective subjects and there is no guarantee that students will choose exactly these courses (fig.2). Just one course of environmental economics is a compulsory course. The rest 38% represent compulsory optional courses that include such courses as corporate social responsibility (CSR), sustainable development, environmental impact assessment (basics) and some others.

**Fig. 1: Distribution of sustainability-related courses that are offered in Business Economics and Management specialization study plan within HEIs**



Source: own calculation based on information from the universities' websites

**Fig. 2: Distribution of sustainability-related courses by their type**



Source: own calculation based on information from the universities' websites

## 4 Discussion

A preliminary overview of business and management curricula shows that sustainability-related courses are presented in almost half of the study plans. These courses are compulsory, compulsory optional and elective. The type of course plays a very important role in the educational process. The insertion of compulsory sustainability-related courses in academic programmes indicates the inclusion of sustainability knowledge into the learning process. However, when the same courses are optional or elective, a student makes the final choice. Then, students take other courses for various reasons and the inclusion of sustainability

knowledge into the learning process is uncertain. The reasons to select sustainability courses are today unknown. Students are unfamiliar with this knowledge, they perceive it as unnecessary or it is just a credit based decision. This paper evidences that the majority of programmes are providing knowledge at compulsory sustainability-related courses. This increases the possibilities to find some competencies in sustainability within graduates. However, the research opens new queries related with the elective courses and their influence of KCS acquirement within graduates. Further analysis of these competencies is needed to identify them on the base of KCS framework (Wiek et al., 2011).

The issue of including sustainability into business curriculum is market-driven. Future managers are not being adequately educated because many universities are moving slowly in integration of sustainability into curriculum (Barber et al., 2014). So, to develop a special course related to sustainability or a new business programme that focuses on sustainability as an academic minor, it is necessary to take into account business community needs in terms of the competencies related to sustainability which graduates acquire.

The inclusion of sustainability in academic programmes needs a complexity approach (Kolmos et al., 2016). This paper evidences that the singularities of each subject influence the sustainability knowledge. However, the current sustainability knowledge offer lacks complex approach across the subjects. Additionally, reference academic programmes such as Green Launching Pad or Certificate in Corporate Sustainability at the University of New Hampshire (Barber et al., 2014) show the necessity to actively develop university-industry relationships in order to determine good academic programmes and contents in sustainability. Therefore, the best way to develop sustainability knowledge includes academic perspective and industry requirements. Our research illustrates that there is an academic perspective in the current “Economics and Management” programmes in the Czech Republic but it is necessary to continue developing the programmes in cooperation with the industries in the real world (Brundiens et al., 2010).

## **Conclusion**

The paper evidences that 43% of public HEIs in the Czech Republic that offer “Business Economics and Management” specialization for “Economics and Management” academic programmes include sustainability-related courses into their curricula. This reflects the possibility of finding KCS within the graduates of these programmes.

The list of courses provided in the research has two groups. There are the courses related 100% with sustainability and the courses that mention it.

This paper looks after the identification of the possible ways of further implementation of sustainability issues into business and management programmes. Sustainability-related courses help future managers to start considering social, environmental and economic values as interconnected parts of a single system and act in a more conscious way. This paper proposes that competencies in sustainability are a core element of sustainability-related courses. It suggests that KCS framework (Wiek et al., 2011) may help for sustainability courses modification, implementing new courses or it may also bring some ideas for design of new programmes that combine management and sustainability.

It is necessary to conduct further studies to extend this investigation by exploring business and management academic programmes in more detail. This includes the research of courses related with other fields of knowledge but with inclusion of some topics and aspects related to sustainability.

### **Acknowledgment**

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## FOREIGN DIRECT INVESTMENTS AS A TOOL OF THE EXPANSION OF CHINESE CORPORATIONS IN V4 COUNTRIES

Tomáš Dudáš

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### **Abstract**

**Purpose:** China is rapidly changing nowadays from a foreign direct investment (FDI) host country to a major investor country on a global scale. Many Chinese corporations are expanding into the international markets and they use FDI as a tool of expansion at an increasing rate. The aim of this paper is to map the expansion of Chinese corporations into the Visegrad group (V4) countries (Czech Republic, Hungary, Poland, and Slovakia) through FDI in these countries.

**Design/methodology/approach:** The paper collects FDI data from the official government (Chinese and V4) and private databases to map the Chinese FDI in V4 countries since the beginning of the 21<sup>st</sup> century. The data will be used to create a comparative study of the V4 countries to localize the most important avenues for the Chinese expansion in these countries.

**Findings:** Using several sources of Chinese OFDI data we demonstrated that these countries are on the periphery of the attention of Chinese companies. However, the FDI activities of Chinese companies clearly increased in the V4 countries after 2005 and this trend is likely to continue also in the coming years. The Chinese FDI projects in V4 countries are mostly concentrated in various sectors of the industry with machinery and electronics being the most important sectors. The events of the last several years show an increased interest of Chinese companies in the energy sector of the V4 countries, what will require a lasting policy response from the governments of the V4 countries

**Research/practical implications:** The paper synthesizes several sources of Chinese OFDI data and includes (limited) policy implications for V4 governments facing giant state-owned Chinese corporations.

**Originality/value:** The paper fills a void in an increasingly important research area as the expansion of Chinese corporations in Europe accelerated in the last years.

**Keywords:** Foreign direct investments, China, Visegrad group countries

**JEL Codes:** F21, F23

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## **Introduction**

The meteoric rise of the Chinese economy is one of the most important phenomena in the current global economy. Decades of dynamic economic growth since the early 1980s made China the largest exporter and the second-largest economy in the world. In the same time, there was also a tremendous change in the structure of corporations in the Chinese economy. The dominance of the state-owned enterprises is long gone and private enterprises play an ever-increasing role in the China. For an increasing number of these companies, the Chinese market is not sufficient anymore and that is why the process of internationalization of Chinese corporations has intensified in the last decade. A growing number of these corporations engages in foreign direct investment (FDI) activities in Europe and some of them also find their way into Central Europe (Merkova, Rajnoha, & Dobrovic, 2016)

The main goal of this paper is to map the expansion of Chinese corporations into the Visegrad group (V4) countries (Czech Republic, Hungary, Poland, and Slovakia) through FDI in these countries. The first part of the paper is a literature review that analyzes the most important motives of the internationalization of Chinese companies via foreign direct investments. Subsequently, the paper collects FDI data from the official government (Chinese and V4) and private databases to map the Chinese FDI in V4 countries since the beginning of the 21<sup>st</sup> century. This data will be used to create a comparative study of the V4 countries to localize the most important avenues for the Chinese expansion in these countries. The paper also focuses on the type of ownership of Chinese corporations investing in the region, as possible government ownership (central or regional) has possible geopolitical implications for the governments of V4 countries.

From a methodological standpoint, we must note that the official Chinese outward foreign direct investment data is notoriously unreliable. The main economic partners of China (ex. USA, EU) often record data of FDI inflows from China that are contradictory with the official Chinese data. The same is true for the data in the case of V4 countries, as in some years the official data of the local authorities is wildly different from the Chinese data. That is why we decided to supplement the official Chinese data with various other available databases of Chinese investment projects (ex. Institute of Social Science of the University of Tokyo, Heritage Foundation, or the Mercator Institute for Chinese Studies)

## **1 Internationalization of Chinese corporations**

For the last two decades of the 20<sup>th</sup> century, China was mostly known as an important FDI host country. The combination of a rapidly growing domestic market and a cheap and dedicated labor force led to a growing interest of transnational corporations in investing in China. The situation started to change with the emergence of strong Chinese corporations that gained dominance in the domestic market. To maintain their growth, international expansion was the next logical step in the development of these corporations. This expansion led to a dynamic growth of outward foreign direct investments (OFDI) from China in the 21<sup>st</sup> century. According to UNCTAD data, in 2015 Chinese corporations invested 128 billion USD abroad, what made China the third most important investor country in the world (UNCTAD, 2016).

The main question is that which factors drive the internationalization of Chinese corporations and whether there are differences from multinational corporations from developed countries (Koraus, Simionescu, Bilan, & Schönfeld, 2017). The traditional theories of international business suggest that firm-specific ownership advantages play the central role in explaining FDI activities (Dunning, 1993). However, there are quite a few authors suggesting that multinational corporations from emerging economies are fundamentally different from their counterparts from developed countries and their internationalization motives are also different (Liu, Buck, & Shu, 2005).

Available research suggests that the process of internalization of Chinese companies is different in developed and developing countries. While greenfield investments dominate the Chinese OFDI to developing countries (Szikorova & Grancay, 2014), in the case of developed countries the OFDI flows take predominantly the form of cross-border acquisitions. Chinese corporations are often seeking strategic assets abroad to increase their competitive advantages and address their weak strategic points (Deng, 2009). Other research also suggests that Chinese corporations use FDI to acquire access to advanced markets or as a way to move in the global value chain (Tan, 2017).

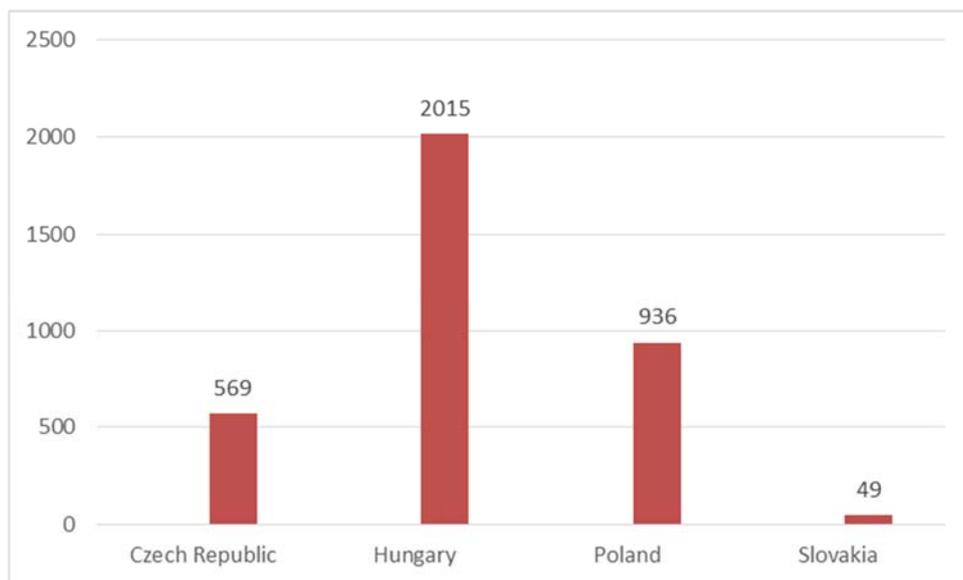
## **2 Chinese foreign direct investments in V4 countries**

The latest available FDI data from UNCTAD and from the **Ministry of Commerce of the People's Republic of China** (MOFCOM) clearly show the focus of Chinese corporations investing abroad. In 2015, Chinese corporations invested 118 billion USD abroad. This means that in 2015 China was the third largest investor country in the world (behind the USA and Japan). The geographical composition of Chinese outward FDI is a bit of an enigma, as the most

important investment locations are either financial centers or tax havens (Hong Kong, Cayman Islands, Singapore, and the British Virgin Islands). According to MOFCOM data, the concentration of Chinese OFDI is extremely high, as the top 10 destinations received 101.63 billion USD of the total investment outflows. In reality, the final destination of the Chinese OFDI is in other countries, as Chinese corporations often use tax havens and financial centers as a location for their subsidiaries.

To get a clearer picture of Chinese OFDI in Europe, we use the data collected by the **Mercator Institute for Chinese Studies**. According to the latest available data, Europe was an important destination for Chinese investors in 2016 as they invested a record 35 billion EUR in this region. However, most of the FDI inflows had the form of cross-border acquisitions and targeted companies in key European countries (Germany, UK, and France). As Central European countries offer only limited possibilities for cross-border acquisitions, it is not surprising that Central Europe does not belong to the core investment destinations for Chinese corporations in Europe.

**Fig. 1: Chinese FDI stock in V4 countries at the end of 2016 (EUR million)**



Source: Hanemann & Huotari, 2017.

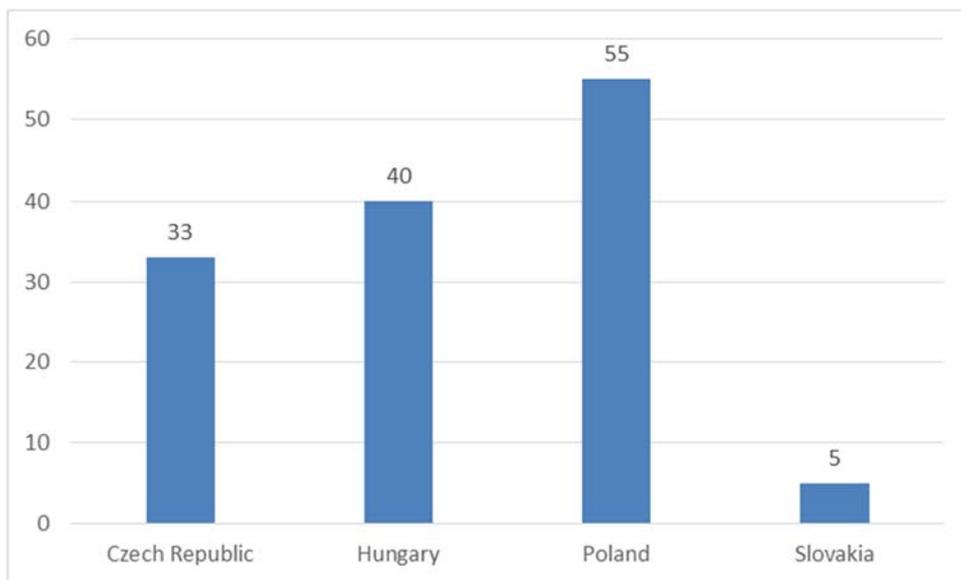
As for the position of **V4 countries**, Figure 1 shows the stock of Chinese FDI in these countries at the end of 2016. It is clearly visible that none of these countries are central to the expansion strategies of Chinese corporations as the total Chinese FDI stock in these countries constitutes only 3.5 % of the total FDI stock in the EU. Moreover, the data is heavily influenced by the Chinese FDI stock in Hungary which is higher than the Chinese FDI stock in the other

three V4 countries. The position of Slovakia is particularly marginal as the total Chinese FDI stock in the country reached only a meager 49 million EUR at the end of 2016.

The data from the **China Global Investment Tracker** created by the Heritage foundation shows a similar picture. This database tracks Chinese FDI with a value larger than 100 million USD and takes into consideration all attempted investment projects (including failed ones). According to this database, Hungary and Poland are the only V4 countries with a relevant level of Chinese FDI (4.6 billion USD and 1.6 billion USD). In comparison, the position of the Czech Republic and Slovakia is extremely marginal – as there is not a single project in the case of Slovakia in the whole dataset.

To see a more detailed image of the Chinese OFDI in the V4 countries we turned to the database compiled by the **Institute of Social Science of the University of Tokyo**. To provide a better view of the Chinese OFDI this database does not rely on official MOFCOM data, rather it is based on the database of project approval information acquired from the Chinese government from 1970 to 2013. This additional data also confirms the marginal position of the V4 region in the expansion plans of Chinese corporations.

**Fig. 2: The number of registered Chinese FDI projects in V4 countries**



Source: Marukawa, Ito & Zhang (Eds.), 2014.

Between 1970 and 2013, there were 28 542 OFDI transactions approved by the Chinese government. The share of approved OFDI projects heading into the V4 countries was more than marginal in this time, as there were only 133 projects declaring an intent to invest in these countries (0.46 % of the total projects). The highest number of projects has been approved for

Poland (55) followed by Hungary (40) and the Czech Republic (33). Slovakia was marginal even for V4 standards, as there were only 5 projects approved for this country.

The time frame of the investment projects confirms that the majority of the Chinese FDI projects in V4 countries happened in the 21<sup>st</sup> century what correlates with the pace of the expansion of the Chinese companies. Of the 133 projects recorded in the V4 countries, only 3 projects happened in the 1990s and 9 between 2000 and 2005. The pace of the OFDI projects is increasing after 2009, as more than half of the total projects (69) happened in the four years between 2000 and 2013. Slovakia is a good example of this process, as there were no projects registered for this country before 2009. These findings are consistent with the official MOFCOM data and with the media sightings of Chinese FDI projects in V4 countries.

As for the sectoral distribution of the Chinese FDI projects in V4 countries, the distribution of the registered FDI projects heading into these countries is relatively diverse. Nevertheless, there are some clearly visible trends in the available dataset. The majority of Chinese FDI projects in the V4 countries were clearly in the industry (90), with services in the distant second place (42). Chinese FDI in agriculture is virtually non-existent, the data show only one single project in Slovakia.

**Tab. 1: The most important sectors of the Chinese FDI projects in V4 countries**

	Czech Republic	Hungary	Poland	Slovakia
Textile	2	4	2	0
Apparel	2	6	4	0
Metal Products	1	1	5	2
Machinery	6	3	6	1
Transport Equipment	3	2	3	0
Electrical Equipment	5	6	7	1
Wholesale and Retail	6	6	10	0
<b>Total Projects</b>	<b>33</b>	<b>40</b>	<b>55</b>	<b>5</b>

Source: Marukawa, Ito & Zhang (Eds.), 2014.

A closer look at the data on the industry level shows a high diversity of Chinese FDI projects in V4 countries. According to the data, almost all sectors of industry received FDI from China. Still, there are some industries with above average FDI inflows. Two sectors (electrical equipment and machinery) are the most important in the industry with 35 projects (26 % of the total projects in V4 countries). Chinese investors were also interested in the textile industry that

recorded (together with apparel) 20 projects in V4 countries. As for services, the wholesale and retail sector is the only one that attracted significant Chinese interest (22 projects).

The diversity of Chinese investors in V4 countries is confirmed also by additional data from the Czech Republic and Slovakia. The list of Chinese investors in the Czech Republic between 2005 and 2011 is diverse, as it contains companies from IT and communication (Huawei, ZTE), automotive industry (YAPP Automotive Parts, SaarGummi), food industry (Shanghai Maling Aquarius), engineering (Buzuluk Komarov) or shipping (COSCO). The situation is very similar in Slovakia (2005-2013), where Chinese investors invested in IT and communication (Lenovo, Huawei), automotive industry (ZVL Auto, Heiland Sinoc Automotive, SaarGummi, Inalfa Roof Systems), engineering (Mesnac European Research and Technical Centre, IEE Sensing Slovakia) or shoemaking (FLAME shoes) (Turcsányi, 2014).

### 3 The Impact of Chinese FDI on the economies of V4 countries

To assess the role of Chinese FDI in the V4 economies we have to take into consideration that the Chinese FDI makes up only tiny fraction of the total FDI stock in these countries. The V4 countries are very EU centric economies, what means that approximately 80 % of the total FDI stock in these countries originates in other EU countries. According the official FDI data on the national level at the end of 2015 (maintained by the V4 central banks) the total FDI stock originating from China does not break the 1 % threshold in any of the V4 countries. Hungary has relatively the highest share of Chinese FDI stock on the total FDI stock with 0.28 % and is followed by the Czech Republic 0.23 %, Poland 0.12 % and Slovakia 0.04 %. Even if we consider FDI originating from Hong Kong as FDI coming from Chinese corporations, the total share of Chinese FDI stock still does not break the 1 % threshold in any of the V4 countries.

**Tab. 2: FDI stocks in V4 countries from China, South Korea and Japan at the end of 2015 (EUR million)**

	South Korea	Japan	China
Czech Republic	2232.4	1277.1	246.5
Hungary	1273.7	753.8	214.7
Poland	833.9	706.3	198.5
Slovakia	2837.4	41.7	15.9

Source: FDI data from V4 central banks.

Comparing FDI originating from key East Asian countries it is clearly visible that China is the least important investor country from that region in the V4 countries (see table 2). The presence of South Korea and Japan is much stronger in all four V4 countries with South Korea being the significant source of FDI from East Asia. South Korean companies such as Samsung, LG, Hyundai/Kia, Hankook or Nexen Tire created tens of thousands of workplaces in the V4 countries in the last decade and their presence is especially strong in the Czech Republic (Hyundai, LG and Nexen Tire) and Slovakia (Kia and Samsung). Compared to South Korean companies the Chinese presence in the V4 countries is much less significant in the industry with the Hungarian Borsodchem (owned by Wanhua) being the largest Chinese employer in the region with approximately 4200 employees. Other Chinese companies in the V4 countries typically employ less than 1000 employees.

The comparison of the entry methods of the Chinese companies into the V4 countries shows a mix of cross-border acquisitions and greenfield investments. Acquisitions tend to have a higher value (ex. Borsodchem in Hungary with approx. 1.7 billion USD), but the total number of greenfield investments is higher. Overall, at this time point the impact of Chinese FDI on the GDP creation and employment in the V4 countries is rather limited, but with a prospect of an increased FDI inflow in the coming years the situation will change (although not dramatically).

#### **4 Chinese FDI in the energy sectors of the V4 countries**

The latest available data from the V4 countries shows that the **energy sector** is developing in an attractive sector for Chinese corporations. In the **Czech Republic**, Chinese energy giant China General Nuclear Power Group is a serious contender for the construction of new reactors in the Temelín and Dukovany nuclear power plants. In neighboring **Slovakia**, another Chinese energy giant (China National Nuclear Corporation) expressed a strong interest in buying a controlling stake in the national energy producing company Slovenské elektrárne from the Italian utility company Enel. Ultimately, the deal fell through, but it clearly shows the growing interest of Chinese energy companies in the Central European region. Chinese investors are also active in the plans to build a hydroelectric power plant on the river Ipel' in Slovakia, but the fate of this project is also uncertain at this moment (Turcsanyi, 2017).

Unlike the Czech Republic and Slovakia, **Poland** has already existing Chinese investments in the energy sector. Chinese investments in Poland have involved the purchase and construction of coal power plants, renewable energy production facilities, and some supporting infrastructure. However, compared to the Chinese plans in the other two countries, the Chinese FDI in the Polish energy sector is more about smaller and mid-size deals

(Turcsanyi, 2017). To provide a complete picture, we must state that **Hungary** is the only V4 country without any Chinese interest in the local energy sector.

The increasing interest of the Chinese companies in the energy sector is raising important policy questions in the V4 countries. As most Chinese companies in the energy sector are state-owned, their potential investment into the energy sector in Central Europe is quite controversial. Although the current Czech and Slovak governments are China-friendly now, there are political parties in both countries that would block the activities of Chinese state-owned companies in the energy sector if they would be part of a governing coalition (Korcsmaros, Mura, & Hevesi. 2016). On the other hand, the Chinese government is doing a lot of soft power politics in Central Europe (ex. introducing the 16+1 summit format in 2014) and as a result, all the current V4 governments view China as an important source of capital in the coming years. Moreover, in the current geopolitical climate China is viewed as a more suitable partner in the energy sector as Russia (especially in Poland and in the Czech Republic) and additionally, all four V4 countries would like to be part of the Chinese One Belt One Road initiative. The public in V4 countries is overwhelmingly positive about the Chinese investment activities in V4 countries, although private companies are more welcome than state-owned companies (ex. the controversial investments of the state-owned China Energy Company Limited in the Czech Republic) (Turcsanyi, 2017).

## **Conclusion**

The main goal of the paper was to map the expansion of Chinese corporations into V4 countries through FDI activities. Using several sources of Chinese OFDI data we demonstrated that these countries are on the periphery of the attention of Chinese companies in Europe which clearly prefer the big economies in Western Europe (Germany, UK, France, or Italy). However, the FDI activities of Chinese companies clearly increased in the V4 countries after 2005 and this trend is likely to continue also in the coming years.

The Chinese FDI projects in V4 countries are mostly concentrated in various sectors of the industry with machinery and electronics being the most important sectors. The events of the last several years show an increased interest of Chinese companies in the energy sector of the V4 countries, what will require a lasting policy response from the governments of the V4 countries. At the position of China in the world economy will continue to get even stronger, FDI projects by Chinese state-owned energy giants will be viewed more suspiciously in the coming years. Local governments also must bear in mind that the public perception of China is

slowly changing in Central Europe and they must tailor their policy responses in order to take into account the positions of the main voter groups.

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## **ARE PUBLICLY SUPPORTED COMPANIES IN THE CZECH FOOD AND DRINK INDUSTRY PERFORMING BETTER? INITIAL FINDINGS FROM THE MICRODATA**

**Ondřej Dvouletý – Ivana Blažková**

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### **Abstract**

**Purpose:** The objective of this study was to empirically observe, whether the Czech companies, which have received a financial subsidy from the European Regional Development Fund during the period of years 2008-2013, reported after the end of the programme better financial results.

**Design/methodology/approach:** For each of the supported companies, authors have collected financial indicators obtained from their profit and loss statements and balance sheets (N=140, 69% of the supported companies in the sector). The three key performance indicators (KPIs) were selected to measure the firm profitability: return on assets (ROA), return on equity (ROE) and price-cost margin (PCM). Authors employed t-test to initially compare the periods before the firms received the subsidy (2005-2007) and after the end of the programme (2014-2015).

**Findings:** The results of the paired t-tests have not found any statistically significant differences for the variables price-cost margin (PCM) and return on equity (ROE). However, the statistically significant difference was obtained for the return on assets (ROA), which suggested that the supported firms reported after the end of programme lower return on assets (ROA).

**Research/practical implications:** Our initial observation suggests that participation of the Czech food companies in the Operational Programme Enterprise and Innovation did not lead to the better financial performance. However, our results need to be taken as preliminary, since more rigorous approach towards the programme evaluation needs to be implemented. This approach would require employment of the counterfactual analysis (CFA), taking into account large heterogeneity across the companies. CFA would also allow us to compare the supported companies with the similar firms present in the economy.

**Originality/value:** Presented study exploits unique firm level dataset and contributes to the Czech regional knowledge by the first observation of the short-term effects of the participation in the public programme.

**Keywords:** Entrepreneurship Policy Evaluation, Food and Drink Industry, Performance of Enterprises, Firm Profitability, the Czech Republic

**JEL Codes:** L53, L26, L66

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## Introduction

Entrepreneurs are being considered for the last decades as bearers of innovation and innovative behaviour (Lukeš, 2013). Promoting innovation and technological progress through entrepreneurship is an important goal of public interventions in EU (Dvouletý and Lukeš, 2016), since entrepreneurship is considered to be an important determinant of competitiveness and economic growth (Dvouletý, 2017a or Dvouletý and Mareš, 2016). Consequently, the evaluation of effects of public interventions on behaviour and performance of firms, is highly relevant due to the efforts to find and implement such policies that have a real impact on the target group (Acs et al., 2016). While quantitative impact evaluation methods are known and applied in the last few decades, their application on the assessment of the impact of public support in the Czech environment is still sparse (e.g. Potluka et al., 2016, Blažková and Maršálková, 2014 or Mezera and Špička, 2013), which emphasizes the need to extend their usage and implementation in practice. Therefore, this study aims to contribute to this issue by focusing on the impact of the particular public support programme on performance of supported firms operating within the Czech food processing industry. The results of the impact evaluation can help to modify the rules for granting aid for the next programming periods in order to be effective and efficient.

When it comes to previously published studies, Mezera et al. (2014) provided an overview of public funding sources in the Czech food industry and they also evaluated profitability and investment activities of publicly supported and unsupported food enterprises in years 2007 and 2012. The authors found out that the economic effects of public interventions were not significant, more concretely, the positive impact of the financial aid on profitability indicators of the supported enterprises, was not confirmed. Different results were published by Mezera and Špička (2013), who evaluated the public support through an added value to food products, in the framework of the Rural Development Programme. Their analysis has shown the positive impact of investment support on financial stability of the supported enterprises. Significant benefits of public support in the Czech agribusiness sector and productivity improvements were confirmed also by Medonos et al. (2012), who conducted quantitative survey of 20 farms which received investment support between years 2008 and 2010. Ratinger et al. (2014) evaluated selected measures<sup>15</sup> under the Rural Development Programme during the period of years 2007-2013 and he concluded that, in general, the selected measures

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<sup>15</sup> Modernisation of agricultural holdings and adding value to agricultural and food products.

improved the performance of supported farms in the Czech Republic. However, he has also reported heterogeneity in impacts on the particular subsamples.

This paper assesses the use of the Operational Programme Enterprise and Innovation (OPEI) in the EU programming period 2007-2013 by the food processing firms in the Czech Republic and its impact on the performance of these supported enterprises. Specifically, the objective of this study is to empirically observe, whether the Czech food companies, which have received a financial subsidy from the European Regional Development Fund (ERDF) during the period of years 2008-2013, reported after the end of the programme better financial results.

Our paper is structured as follows: firstly, we describe the public programme and the structure of the supported enterprises within the Czech food processing industry. Secondly, we introduce the data used and our empirical approach. In the same part of the article, we use paired t-test to compare the financial results of supported enterprises in the periods before these firms received the subsidy (2005-2007) and after the end of the programme (2014-2015). Finally, we draw conclusions and discuss suggestion for future research.

## **1 Support of the Czech Food Processing Firms within the Operational Programme Enterprise and Innovation (OPEI)**

The Operational Programme Enterprise and Innovation (OPEI) builds on the Operational Programme Industry and Enterprise (OPIE) which ran between years 2004-2006 after the Czech Republic's accession to the European Union. OPEI was implemented during years 2007-2013. In the EU programming period 2014-2020 the programme (OPEI) continues as the Operational Programme Enterprise and Innovations for Competitiveness (OPEIC). The programme was administered by the Ministry of Industry and Trade of the Czech Republic. The focus of OPEI was to support especially small and medium sized enterprises (SMEs) from the EU Structural Funds. The objective of the programme was to improve the Czech business environment and to increase its competitiveness of the Czech economy. A business friendly environment is attractive for start-ups and it is also beneficial for the growth of already established enterprises. Overall increase in entrepreneurial activity may further result in higher economic growth and higher employment (Ministry of Industry and Trade of the Czech Republic, 2013). This was recently supported by Dvouletý (2017b) who found positive influence of the new business formation on the GDP of the Czech regions. He has also found a negative impact of the new business formation on the regional unemployment rates.

In this study, we are interested in the outcomes of the programme on the financial performance of the Czech food processing firms. According to NACE classification, the Czech food processing industry consists of the activities CZ-NACE 101 – CZ-NACE 110<sup>16</sup>. Table 1 informs reader about the activities of the supported firms in the sector, and also about the number of supported companies/projects in each of the category. From Table 1, one can observe that supported companies received subsidies mainly on new technologies, efficient use of energy and on investments in real estates or on building of production capacities.

**Tab. 1: Number of Supported Companies and Projects within Particular Sectors**

NACE Code	Most often supported activities (percentage share on total number of supported projects in the particular sector)	Number of supported companies/projects
CZ-NACE 101	Consulting for the introduction of innovations (100%)	1/1
CZ-NACE 102	-	0/0
CZ-NACE 103	New technologies with higher production efficiency (100%)	2/2
CZ-NACE 104	Building, maintenance and restoration (33.3%), export support and promotion (33.3%)	4/9
CZ-NACE 105	Expansion into foreign markets (28.6 %), energy savings in production (28.6%)	6/7
CZ-NACE 106	Modernization of technological equipment – mostly new production lines (33.3%), export support and marketing (20.8%)	13/24
CZ-NACE 107	Modernization of technological equipment, i.e. new production lines or technological innovations (48%), energy savings (15.7%).	69/102
CZ-NACE 108	Export support and marketing (19.6%), modernization of technological equipment (18.6%), building restoration (18.6%), new products (16.5%)	58/97
CZ-NACE 109	Export support (30%), energy savings (20%)	7/10
CZ-NACE 110	Building restoration (21.2%), modernization of production equipment (20%), energy savings (18.8%).	43/85

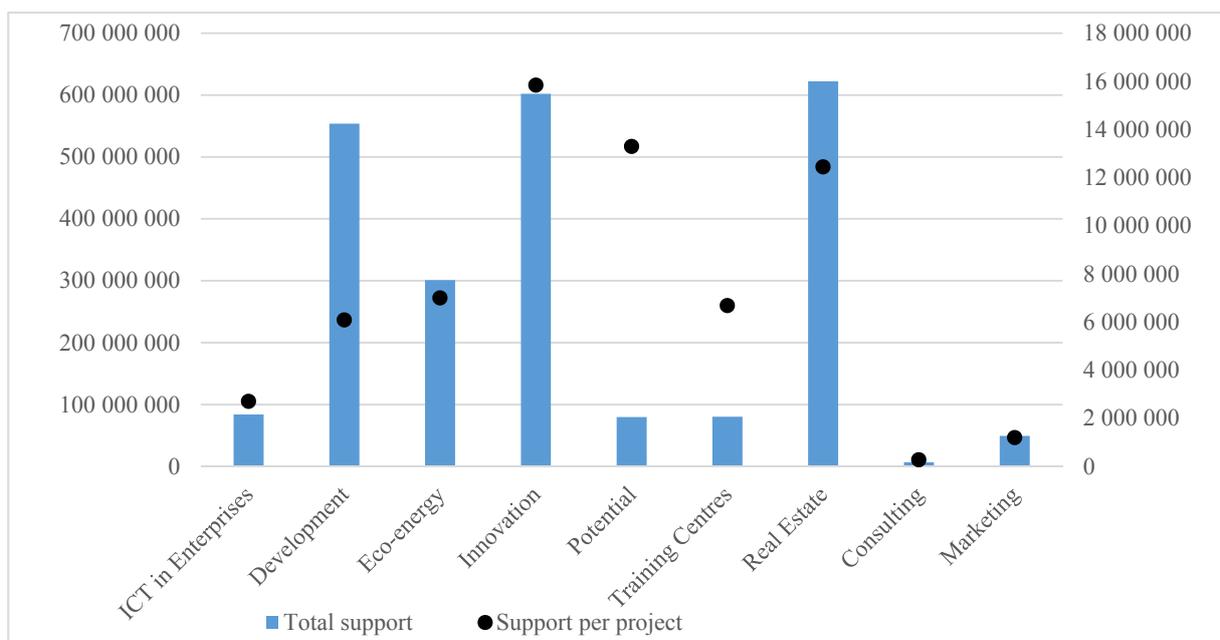
Source: Czech Invest (2017); author's elaboration

<sup>16</sup> CZ-NACE 101: Production, processing, preserving of meat and meat products; CZ-NACE 102: Processing and preserving of fish and fish products; CZ-NACE 103: Processing and preserving of fruit and vegetables; CZ-NACE 104: Manufacture of vegetable and animal oils and fats; CZ-NACE 105: Manufacture of dairy products; CZ-NACE 106: Manufacture of grain mill products, starches and starch products; CZ-NACE 107: Manufacture of bakery and farinaceous products; CZ-NACE 108: Manufacture of other food products; CZ-NACE 109: Manufacture of prepared animal feeds; CZ-NACE 110: Manufacture of beverages.

OPEI consisted of the seven priority axes and each of the axes was further divided into several programmes, depending on the area of support (Ministry of Industry and Trade of the Czech Republic, 2013). It is important to note that all companies could apply for more than one project and therefore the supported enterprises could have been supported more than once.

When it comes to total amount of funds paid from the OPEI, the most utilized support programme was the programme Real Estate (26.15% of total funds) as seen from Figure 1. The highest average support per project was in the programme Innovation (15,842 ths. CZK), which is probably based on the high financial demands in the case of innovation activities. On average, higher financial amounts per project were also allocated within the programme Potential (13,295 ths. CZK) that is related with innovation activities as well, and within the programme Real Estate (12,445 ths. CZK), which involves projects with high financial requirements.

**Fig. 1: Total Financial Support and Average Support per Project (in CZK)**



Source: CzechInvest (2017); author's elaboration

The aid programmes drawn by the food processing firms are shown together with the structure of supported projects in Table 2. The total number of supported projects in the Czech food processing industry in the period 2007-2013 was 337, out of the most applications were within the Development support programme, i.e. 27% (91 projects), which emphasizes the need to increase competitiveness of the food processing firms in the Czech Republic through the new technical facilities. The most frequent projects supported in the Czech food industry were projects focused on modernization of production lines and equipment.

**Tab. 2: Support Programmes within OPEI in the Czech Food Processing Industry**

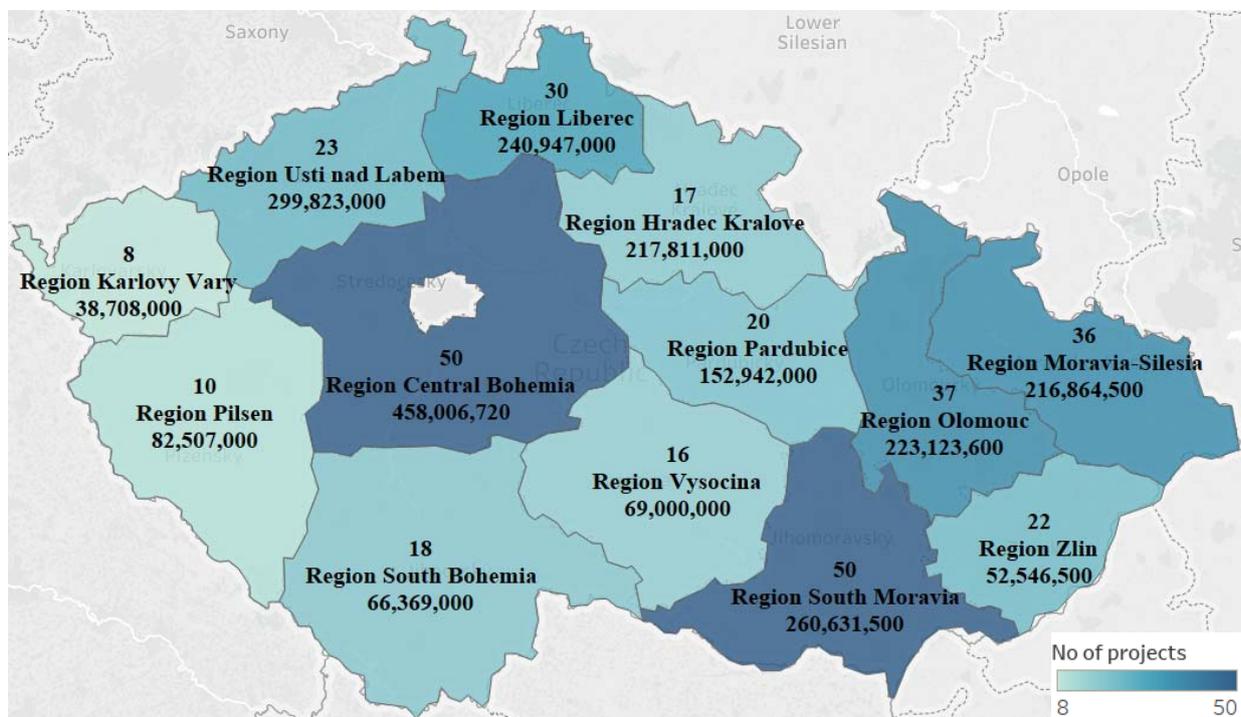
Priority axis	Support programme	Objective of the Programme	Number of supported projects	Relative frequency of supported projects
2. Development of Firms	<b>ICT in Enterprises</b>	extension or introduction of information and communication technologies	31	9.20%
	<b>Development</b>	competitiveness of firms through the introduction of advanced technologies (new equipment with higher technical and utility parameters)	91	27.00%
3. Effective Energy	<b>Eco-energy</b>	Increase of the efficiency in the energy production, transmission and consumption	43	12.76%
4. Innovation	<b>Innovation</b>	technical and non-technical innovation, product and process innovation, organizational and marketing investments	38	11.28%
	<b>Potential</b>	Increase of the capacity for implementation of research activities and growth of companies which conduct their own research, development and innovation activities	6	1.78%
5. Environment for Enterprise and Innovation	<b>Training Centres</b>	subsidies for the construction, reconstruction, acquisition or equipment of training centres or training rooms	12	3.56%
	<b>Real Estate</b>	establishment and development of entrepreneurial real estate and related infrastructure	50	14.84%
6. Business Development Services	<b>Consulting</b>	concessionary consulting services	25	7.42%
	<b>Marketing</b>	development of activities of Czech exporters on the foreign markets	41	12.17%

Source: Ministry of Industry and Trade of the Czech Republic (2013), CzechInvest (2017); author's elaboration

As documented in Figure 2, the highest number of supported projects was implemented in the Region South Moravia and in the Central Bohemia Region (50 projects). The Region

South Moravia is generally considered as an important centre of R&D (Blažková, 2016), which is confirmed by the fact that the majority of supported projects in this region falls into the Development programme. However, the total funds paid to the food firms in this region (260,632 ths. CZK) are lower than in Central Bohemia region (458,007 ths. CZK), which gives evidence about lower financial demands of the supported projects in the Region South Moravia. On the other hand, the regions with the lowest activity within the OPEI are the Region Karlovy Vary (8 projects) and the Region Pilsen (10 projects).

**Fig. 2: Number of Supported Projects (top) and Total Amount of Allocated Funds (bottom) across the Czech Regions**



Source: CzechInvest (2017); Tableau, author's elaboration

## 2 Data and Empirical Results

The analysis is based on the microdata collected from the database MagnusWeb (Bisnode, 2017) which includes financial statements of the Czech enterprises. We have exploited data from the database for all Czech food processing companies based on the CZ-NACE codes. In case that the data were missing, we have searched for the balance sheets and profit and loss statements of the particular companies on the websites of the Ministry of Justice of the Czech Republic (Ministry of Justice of the Czech Republic, 2017) in order to minimize the missing values. Based on the database of the CzechInvest (2017) we have identified 203 firms

participating on the OPEI support. Due to the fact that some business have received support for more projects, the number of supported projects is larger - 337. Our efforts resulted in having financial data for 140 supported companies, accounting for 69% of the programme participants within the sector.

In our study, we aim to analyse, whether the supported companies reported better financial performance after they acquired the public support (2014-2015), compared to the period before they received the subsidy (2005-2007). To make sure that our results are not biased by the measurement of the financial performance, we use the three key performance indicators (KPIs) to measure the firm profitability: return on assets (ROA), return on equity (ROE) and price-cost margin (PCM), calculated as follows (Megginson et al., 2008):

$$ROA = \frac{EBIT}{Total\ Assets} \times 100 \quad (1)$$

$$ROE = \frac{EAT}{Equity} \times 100 \quad (2)$$

$$PCM = \frac{Value\ Added - Labour\ Cost}{Sales} \times 100 \quad (3)$$

From the methodological point of view, our study is based on the paired t-test, and compares firm-level data for the periods before the firms received the subsidy (2005-2007) with the period after the end of the programme (2014-2015). All calculations are based on the statistical software STATA 14 and the results are reported in Table 3 below. The results of the t-tests have not found any statistically significant differences before and after the intervention for the variables representing price-cost margin (PCM) and return on equity (ROE). However, the statistically significant difference was obtained for the return on assets (ROA), which suggested that the supported firms reported after the end of programme (2014-2015) on average lower return on assets (ROA) by 3%, compared to the period before the subsidy (2005-2007). Therefore, our initial observation cannot support the positive outcomes of the programme, two years after the end of support. Obtained results are not in the line with findings of Mezera and Špička (2013) who have observed positive outcomes on the financial performance of the supported companies in the Czech food sector.

**Tab. 3: Results of the Paired T-test Comparing Financial Performance of the Supported Companies before they received subsidy (2005-2007) and after (2014-2015)**

Variable	Observations	Mean	Std. Err.	Std. Dev.
PCM0507	140	11.32546	3.861815	45.69361
PCM1415	140	12.88835	1.369665	16.2061
<b>Difference</b>	140	-1.562886	3.773388	44.64733
<b>T-statistics</b>	-0.4142	<b>P-value</b>	0.6794	
Variable	Observations	Mean	Std. Err.	Std. Dev.
ROA0507	140	8.908652	.8807921	10.42167
ROA1415	140	5.781337	.7793844	9.221801
<b>Difference</b>	140	3.127315	1.059267	12.53342
<b>T-statistics</b>	2.9523	<b>P-value</b>	0.0037	
Variable	Observations	Mean	Std. Err.	Std. Dev.
ROE0507	140	8.062292	6.345892	75.0856
ROE1415	140	10.91678	1.884377	22.29625
<b>Difference</b>	140	-2.854489	6.58842	77.95524
<b>T-statistics</b>	-0.4333	<b>P-value</b>	0.6655	

Source: STATA 14, author's elaboration

## Conclusion

Substantial part of the financial resources, allocated from the European Regional and Development Fund (ERDF), is dedicated to the promotion of entrepreneurship. In the Czech Republic the financial support was allocated through the Operational Programme Enterprise and Innovation (OPEI), which took a place during the period of years 2007-2013. Unfortunately, not many scholars tried to analyse the outcomes of the programme. Therefore we wanted to contribute to this under-researched knowledge. Particularly, we aimed to analyse, whether the supported companies from the Czech food processing industry, reported better financial performance after they acquired the public support (2014-2015), compared to the period before they received the subsidy (2005-2007). Our results are methodologically based on the t-test and it suggests that participation of the Czech companies in the Operational Programme Enterprise and Innovation (OPEI) did not lead to the better financial performance of the supported enterprises. However, our results need to be taken as preliminary, since more rigorous approach towards the programme evaluation needs to be implemented. This approach would require employment of the counterfactual analysis (CFA), taking into account large

heterogeneity across the companies. CFA would also allow us to compare the supported food companies with the similar firms present in the industry and to conduct impact evaluation on already implemented projects.

Presented study also aimed to encourage other scholars, especially those from Central and Easter European region, to conduct empirical evaluations of public policies more often. The motivation behind this call is that obtained findings have crucial implications for the local policy makers and helps them to adjust public programmes based on the scientific evidence.

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## WHO IS REALLY RESIDING IN THE CZECH BUSINESS INCUBATORS?

Ondřej Dvoutělý – Michal Andera – Martin Lukeš – Zuzana Oravcová

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### Abstract

**Purpose:** There is no official statistics on types of companies that reside in business incubators and accelerators. Purpose of this study is to shed some light on who is using services of the business incubators in the Czech Republic.

**Design/methodology/approach:** Since November 2016, we have contacted via phone and email representatives of the Czech entrepreneurial infrastructure. We have managed to get self-reported list of supported enterprises from 32 (51%) out of 63 Czech business incubators and accelerators. In total, we have received 894 names of companies, and out of them we were able to identify 794 (89%) companies. The identification and verification was conducted with a help of business register and database Albertina. We used Albertina database further to obtain firm's characteristics.

**Findings:** Supported companies are most densely located in Prague, Moravia-Silesia and South Moravia regions. Most of the enterprises are companies with limited liabilities. We report slightly higher failure rate among the incubated companies when compared to the ratio of companies which annually withdraw from business and the total amount of economically active enterprises. Financial data show that more than half of the companies reported annual turnover lower than 2 mil. CZK. Based on Chi-square test, we confirmed association between the year of official registration and revenues' size of the supported companies.

**Research/practical implications:** Our study offered initial insight into the performance of the companies supported by entrepreneurial infrastructure in the Czech Republic. Building upon presented findings, a more sophisticated analysis of the financial performance, based on historical data and variety of indicators, is needed in order to obtain more robust results.

**Originality/value:** Presented study exploits a unique glimpse of the ecosystem reality on the level of tenant firms, revealing which companies are really using the incubators and what is their performance.

**Keywords:** Business Incubator, Accelerator, Entrepreneurial Infrastructure, Entrepreneurship Policy, the Czech Republic, Start-up

**JEL Codes:** M13, L53, L26

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## **Introduction**

Entrepreneurs promote innovation and technological progress through the creation of new products, services and business models. Successful start-ups improve innovation and social cohesion (e. g. Lukeš, 2013 or Lewis et al., 2011). They enhance growth of the economy and they are a source of new jobs (e. g. Dvouletý, 2017 or Theodorakopoulos et al., 2014). Therefore, many governments support entrepreneurship through variety of public policies. European Union is not an exception (European Commission, 2003). Dvouletý and Lukeš (2016) point out that there are many forms of entrepreneurship policies and each of them should have a clear objective, target audience and measurable outcomes. Roig-Tierno et al. (2015) further note that effective entrepreneurial infrastructure might be associated with higher entrepreneurial activity in the area. Entrepreneurial infrastructure is most frequently represented by business incubators and accelerators. Business incubators and accelerators have been considered as institutions, supporting new entrepreneurial activity (Mian et al., 2016 or Aerts et al., 2007) and especially high-growth enterprises (Autio and Rannikko, 2016).

First incubator was established in 1959 in New York. Since then the concept of business incubation became a worldwide phenomenon. In the Czech Republic first business incubators were founded in the early 90s (Aerts et al., 2007). We need to admit that there is no exact definition of the business incubator – not in the literature and not even in the Czech law. Incubators usually support early stage ventures by offering office space and various support services. Incubated firms should benefit also from entrepreneurial spirit within incubators. Companies share similar attitude and they can inspire each other (Pauwels et al., 2016).

Recent empirical evidence (e. g. Vásquez-Urriago et al, 2016 or Kim et al., 2014) also concludes that there is little known about the effectivity of entrepreneurial infrastructure, incubated firms and their outcomes. Only handful on incubators list their tenants online. Generally, they showcase only the tip of the iceberg – the most successful alumni. We have no way of finding exactly who is really using this support system. We have decided to approach the situation in the Czech Republic from the end user point of view. Previous researchers (e. g. Procházková et al., 2011; Peterková et al., 2014 or Andera and Lukeš, 2016) studied the Czech entrepreneurial infrastructure and they report the regional distribution of supporting institutions. Nevertheless, they do not analyse the supported enterprises and their outcomes. In the Czech Republic, incubators and accelerators do not have any reporting obligation.

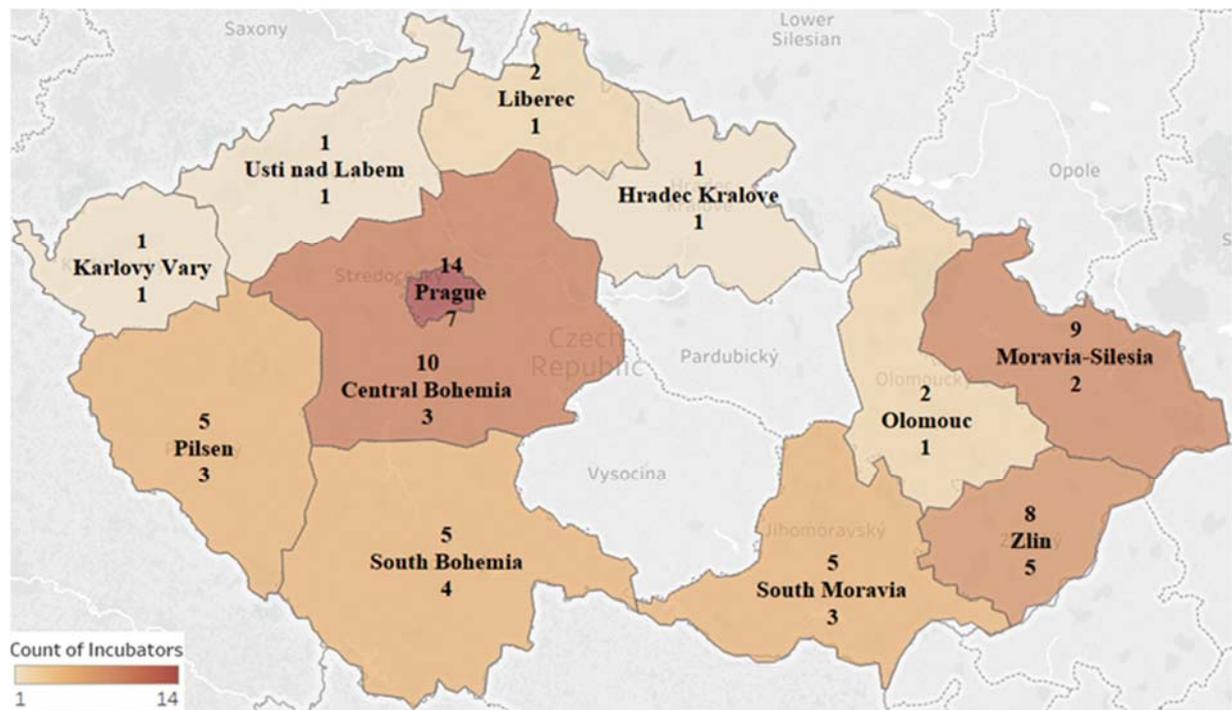
Who is really using the business incubators? There is no simple way to find out who is using business incubators, and what the impact on the incubated companies is. We set out to compile a list of companies that used services of incubator at some point in their existence and analysed their financial performance and survival rates, which are the main success indicators in the business incubator research (Theodorakopoulos et al., 2014). Our study offers a unique glimpse of the ecosystem reality on the level of tenant firms, revealing which companies are really using the incubators and what is their performance.

## **Empirical Approach and Findings**

The objective of this paper is to explore enterprises in the Czech Republic, which were supported by business incubators and accelerators. Our study extends the research efforts of the project Start-up Promotion for Entrepreneurial Resilience – SUPER (Project SUPER, 2017), which among other tasks, intended to map business incubation and entrepreneurial support systems in several European countries. Concretely, we utilize the list of business incubators and accelerators which was presented in the study by Andera and Lukeš (2016) and which is also publically available online (Best Start-ups in CR, 2017). Best Start-ups in CR (2017) lists in May 2017 in total 74 organizations. Our research team used the collected list of entities as a baseline for this research. After removing duplicities, we ended up with 63 organizations.

In the first stage of this exploratory study, we have contacted via phone and email representatives of Czech business incubators and accelerators (owners, directors and managers) with a request to provide us with a historical list of supported enterprises since their establishment. During this stage, we have learned that many of the contacted entities do not have such a list. This ongoing process started in November 2016 and we have managed to collect self-reported lists of supported enterprises from 32 (51%) organizations. Regional distribution of entrepreneurial infrastructure together with the number of collected lists are depicted on Figure 1 below.

**Fig. 1: Regional Distribution of the Czech Incubators and Number of Collected Lists**



Source: Collected data based on Best Start-ups in CR (2017), author's elaboration

In total, we have received 894 names of companies, and out of them we were able to identify 794 (89%) companies. The identification and verification was conducted with a help of business register and database Albertina (Bisnode, 2017). We further used Albertina database to obtain firm's characteristics. As we noted before, this is an ongoing exploratory research and we use this opportunity to present characteristics of companies, we were able to collect so far. We are particularly interested in the regional distribution of the supported entities, their legal form and financial performance.

From the regional perspective (Table 1), majority of the supported companies are in the regions: Prague (30%), Moravia-Silesia (14.7%) and South Moravia (13.7%). This also corresponds with the placement of the entrepreneurial infrastructure. According to Andera and Lukeš (2016) or Peterková et al. (2014), in these three above mentioned regions is the highest density of supportive organizations.

**Tab. 1: Regional Distribution of Firms**

NUTS 3 Region	Frequency	Percent
Prague	238	30
South Bohemia	39	4.9
South Moravia	109	13.7
Karlovy Vary	15	1.9
Vysocina	3	0.4
Hradec Kralove	10	1.3
Liberec	6	0.8
Moravia-Silesia	117	14.7
Olomouc	50	6.3
Pardubice	8	1
Pilsen	43	5.4
Central Bohemia	34	4.3
Usti nad Labem	18	2.3
Zlin	104	13.1
Total	794	100

Source: Collected data, author's elaboration

Table 2 informs us about the legal form of the supported enterprises. It is not surprising that most of the enterprises are companies with limited liabilities (69.5%), followed by self-employed individuals (15%) and joint stock companies (8.4%). However, there are also public institutions, syndicates and associations. We would not expect these legal entities to be future gazelles and high-growth enterprises, nevertheless, these findings have been obtained. They might be using the premise of incubator, because their focus is relevant to the entrepreneurial ecosystem support.

**Tab. 2: Legal Form**

Legal Form	Frequency	Percent
Joint Stock Company	67	8.4
Syndicate	2	0.3
Societas Europaea	3	0.4
Citizens Association	7	0.9
Trade Union	1	0.1
Foreign Company Subsidiary	5	0.6
Self-employed Person	119	15
Governmental Organization	3	0.4
Limited Liability Company	552	69.5
Association	23	2.9
State Company	1	0.1
Partnership	2	0.3
Public Research Institution	2	0.2
University	1	0.1
Foreign Self-employed Person	6	0.8
Total	794	100

Source: Collected data, author's elaboration

We were further curious what the economic performance of the supported enterprises is. According to our investigation, 4.3% of companies were no longer economically active. Some insight and comparison might be made, once we compare the data with organizational statistics reported by the Czech Statistical Office (2017). If we have a look at Table 3, we may see that the registration years of companies are quite heterogeneous and that there are even entities which were officially established before year 1995. Therefore, we might compare the numbers with the ratio of companies which annually withdraw from business and the total amount of economically active enterprises. This ratio is according to the Czech Statistical Office (2017) quite stable and for the last decade, it was on average 2.7%. To conclude, rates of failure are in our collected sample slightly higher, in comparison with the population of active enterprises.

We also explored categories of turnover, indicating the financial performance of the supported companies. The highest ratio of companies (54%) report annual turnover lower than 2 mil. CZK. On the contrary there are 8.5% of the promising enterprises which reported annual turnover larger than 100 mil. CZK. From the Table 3, it can be clearly seen that there is an association between the year of official registration and size of the revenues. This relationship was statistically supported by the results of the Chi-Square test. For example, one may notice that, the highest ratio of companies reporting annual turnover lower than 2 mil. CZK, established their business after year 2010. Additionally, we may see the overall increase in the

amount of supported companies, founded after year 2006. This reflects the increased amount of business incubators and accelerators, which were funded by the resources allocated from the European Union, after the Czech Republic joined European Union (Andera and Lukeš, 2016). This association also confirms, that firm age is an important determinant of the financial performance.

**Tab. 3: Association between Category of Revenues and Year of Registration**

Year/Category	< 0.4 mil.	0.5 - 2 mil.	3 - 9 mil.	10 - 99 mil.	> 100 mil.	Total
Before 1995	12 (18.91) [2.53]	13 (24.70) [5.54]	17 (15.35) [0.18]	22 (15.13) [3.12]	17 (6.90) [14.79]	81
1995-2000	24 (28.72) [0.78]	26 (37.51) [3.53]	20 (23.32) [0.47]	30 (22.98) [2.15]	23 (10.48) [14.98]	123
2001-2005	14 (17.05) [0.54]	21 (22.26) [0.07]	13 (13.84) [0.05]	15 (13.64) [0.14]	10 (6.22) [2.30]	73
2006-2010	53 (53.94) [0.02]	80 (70.44) [1.30]	46 (43.79) [0.11]	42 (43.15) [0.03]	10 (19.67) [4.76]	231
After 2010	67 (51.37) [4.75]	82 (67.09) [3.31]	42 (41.70) [0.00]	27 (41.10) [4.84]	2 (18.74) [14.95]	220
Total	170	222	138	136	62	728

**Note:** Chi-Square 58.23, p-value < 0.0001, missing = 66

Source: Collected data, Bisnode (2017), author's elaboration

## Conclusion

Business incubators and accelerators were identified as a popular way to support new entrepreneurial activity, and especially high-growth enterprises. Nevertheless, only a little is known about the entrepreneurial infrastructure, incubated firms and their outcomes. Our study contributes to this research gap, based on the self-reported list of the companies which at some point in their existence used services of the Czech incubators and accelerators. Presented study reveals individual characteristics and financial performance of the firms, which were supported by the Czech entrepreneurial infrastructure.

Collected firm level data show a slightly higher failure rate among the incubated companies when compared with the population of active enterprises. Incubators and accelerators generally focus on innovative and high growth companies with brave visions and ambitious plans. This might be an explanation for a slightly higher failure rate among those companies. They aim high and fail often. This is an ongoing research aimed at analysing the impact of entrepreneurial infrastructure. The main limitation is that we rely on the decision of the incubator management to provide us with the list of their tenants. In case they do not maintain any database, it is hard to establish continuity when the management team changes. Secondly, we have offered only initial insight into the firm's performance. More sophisticated analysis of the financial performance, based on historical data and variety of indicators is needed in order to obtain more robust findings.

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## ENTREPRENEURSHIP LOST AND FOUND

Daniel Ericsson – Patrik Persson

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### Abstract

**Purpose:** In light of the many attempts within the social/societal turn of entrepreneurship to disconnect entrepreneurship from economic rationality and embrace it as an act of social becoming, the purpose is to reconnect entrepreneurship to its primary function within the capitalist regime: to make money and accumulate capital. This function, it is argued, is lost in present day research on entrepreneurship, and the aim therefore is to present a framework in which both economic and social aspects are found crucial for understanding entrepreneurship.

**Design/methodology/approach:** Following post-positivist research traditions the research is based on an auto-ethnographic case study of entrepreneurship in the field of music. In focus is the phenomenon of collecting records, and the cultural web of social and economic significances that unfolds by means of the authors confessional tales about engaging in record collecting is used as an interpretative lever to question the dichotomy between social and economic rationality and value within contemporary research on entrepreneurship.

**Findings:** In contrast to becoming or being perspectives on entrepreneurship, our interpretations lead us to frame entrepreneurship in terms of a having-mode. This mode in turn suggests a primary epistemic orientation based upon three interrelated socio-economic aspects: 1) a systemic know-what in order to distinguish field-specific values from non-value, 2) a systemic know-how to convert social value into economic value, and vice versa; and 3) a systemic know-how to create, capitalise upon and accrue field specific surplus value.

**Research/practical implications:** The proposed framework breaks with both modern and postmodern notions of entrepreneurship, and thereby opens up new vistas for research on entrepreneurship as intrinsically a social *and* economic phenomenon.

**Originality/value:** By opening up new vistas for research on entrepreneurship, alternative ways of describing, prescribing and understanding entrepreneurship are offered.

**Keywords:** Entrepreneurship, surplus value, auto-ethnography, having-mode, collecting

**JEL Codes:** M10, L26, L31

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## **Introduction**

Ever since Gartner (1989) argued for a shift in focus from individual traits to the creation of organizations, social aspects of entrepreneurship have been a major interest amongst researchers on entrepreneurship. On one hand entrepreneurship has been embraced as a social construction (cf. Steyaert and Katz, 2004), and as such socially embedded in, for instance, entrepreneurial regions or networks (cf. Johannisson, 1988). On the other hand, entrepreneurship has been associated with social/societal values that are deemed to stand in opposition to economic value (cf. Perren and Jennings, 2005).

This social/societal turn is most often rooted in an ideological critique of the hegemonic discourse on entrepreneurship (cf. Ogbor, 2000; Jones and Spicer, 2005; Perren and Jennings, 2005). This discourse, it is argued, functions as a binary machinery that (re)produces entrepreneurship as biased in terms of gender and ethnicity, but also exclusively as an economic matter (cf. Ogbor, 2000). The ideal brought forward by the discourse is the ideal of Horatio Alger, i.e. the American dream of the self-made man who starts off with two empty hands, takes risks and works hard, and in the end is greatly rewarded financially. The hegemonic discourse on entrepreneurship thus accord with the capitalist regime and its ethos and logos of capital accumulation, appropriation of surplus value and growth – an accordance that leads Perren and Jennings (2005, p. 178-179) to conclude that the hegemonic discourse on entrepreneurship is a “macho-driven discourse of scale” that subjugate entrepreneurs to be perpetually dominated by the “economic machine”.

As a consequence of this ideological critique, the social/societal turn is nurtured by emancipatory ideals. By reclaiming (Steyaert and Katz, 2004), destabilizing (cf. Jones and Spicer, 2005) or demobilising (cf. Bill et al, 2010) the hegemonic discourse on entrepreneurship, entrepreneurship will be freed, it is argued, from its capitalist chains, and new forms and types of entrepreneurship will be released. The primary road to this emancipation is to widen the empirical base of entrepreneurship, either by embracing organizations that has been made invisible by the hegemonic discourse because of their non-economic character such as social movements, public administrations, NGOs or civil society at large (cf. Lundgaard Andersen et al, 2016) – or by adopting a processual ontology that stipulates that entrepreneurship is an act of social becoming.

Most prominent amongst those researchers that adopt this processual ontology are Chris Steyaert and Daniel Hjorth who repeatedly have urged researchers to look for entrepreneurship in places other than the taken-for-granted ones (cf. Hjorth and Steyaert, 2010). There is no point in continue studying entrepreneurship in Silicon Valley, they argue, that has already been done

and only contributes with nourishing the Horatio Alger myth. Much better is instead to study entrepreneurship in the “(v)alleys”, beyond the established geopolitics of the hegemonic discourse (cf. Steyaert and Katz, 2004).

Hjorth and Steyaert (2010, s. 1) label their research program “movements in entrepreneurship”, alluding to the program’s processual ontology, but also to its political ambitions to move entrepreneurship beyond the confines of the hegemonic discourse, and back to what entrepreneurship once was and what it should be: A prosaic phenomenon for everyone to engage in. Movements in entrepreneurship is thus conceptualized as a democratic project and, from a variety of different theoretical definitions, practically everything is turned into entrepreneurship. In one of his writings Steyaert (together with Katz, 2004, p. 194) even go as far to equate entrepreneurship with everything in life experienced to be beautiful: *”We have the potential to find the beauty of entrepreneurship in almost any interaction we see. Indeed, the space of entrepreneurship in society is about nothing less than beauty.”*

## **1 Problematicization and purpose**

The social/societal turn of entrepreneurship research has indeed contributed with a nuanced and differentiated understanding of what entrepreneurship is, could be – and ought to be. There are however some troublesome side-effects following in the wake of the movements in entrepreneurship that risk making research on entrepreneurship more or less meaningless.

First of all, the movements seem to be based on an ontological fallacy implying that, since everything is changing and entrepreneurship is change, everything is entrepreneurship. With such an ontological imperative it is impossible to distinguish entrepreneurship empirically (except by using beauty criteria, that is) – and as a consequence it is impossible to conduct empirical research on anything else but entrepreneurship. Entrepreneurship thus has no empirical background; it is everywhere and as such empirically devoid of meaning.

Secondly, with the ontological imperative in mind, one could assume that economical aspects of entrepreneurship also would be part of the movements agenda. Here it seems, though, as if the ambition to disconnect entrepreneurship from the hegemonic discourse on entrepreneurship makes the researchers confuse the purpose of entrepreneurship with the social becoming of entrepreneurship. The reasoning is almost teleological in character: Entrepreneurship is socially constructed, therefore the construction in itself must be social in character, and therefore not of an economic kind. That is to say that the movements in entrepreneurship functions as a binary machinery that not only excludes entrepreneurship from the economy but also excludes the economy from society. In light of the importance that the

movements scholar ascribes the capitalist regime, this seems to be nothing but a meaningless contradiction in terms.

The researchers following the movements in entrepreneurship thus run the risk of ending up colonizing the social world with entrepreneurship (cf. Ericsson, 2010), yet leaving the economic world behind as if it has nothing to do with entrepreneurship. This is not only empirically insensitive to how entrepreneurship is constructed in capitalist society, but also rather reductionist since the primary function of entrepreneurship within the capitalist regime – to make money and accumulate capital – simply is lost. The purpose of this paper therefore is to reconnect entrepreneurship to the “economic machine” but without losing the social constructionist insights from the social/societal turn of entrepreneurship research. Our aim is to present a framework in which both economic and social aspects are found to be crucial for understanding entrepreneurship.

## **2 Method**

Staying true to the processual ontology of the movements in entrepreneurship, we turn to a very prosaic or mundane phenomenon in order to ground our framework empirically; the collecting of records. This phenomenon has previously mainly been researched from sociocultural perspectives and conceptualised as a predominantly symbolic activity carried out by specific types such as dandies, hipsters and nerds (cf. Straw, 1997). Types like these, argues Straw (*ibid.*, p. 8), thrive upon “showing off” their knowledge in music in public, and their collections are seen as symbolic representations of their cultural (capital) (dis)positions and identities. Collecting records is a matter of communion, status and identity, states Bjurström (2002, p. 254), and therefore the notion of homo oeconomicus must be refuted when dealing with the phenomenon (*ibid.*, p. 262). The phenomenon thus could be seen as an act of social becoming that is in line with the social/societal turns in entrepreneurship. And, as such, it becomes a clear case of entrepreneurship.

Inspired by Johannisson’s (2005) proposition that entrepreneurship only could be understood “from within” our empirical phenomenon is researched by the use of autoethnographic (or interactive) methods. One of the authors of this text, Patrik Persson, is a record collector since many years, and some of his record collecting ventures are here presented as thick descriptions in order to illuminate and convey meaning about the phenomenon. The ventures are presented in terms of confessional tales (cf. Van Maanen, 1988) and they have been strategically chosen in order to highlight the cultural web of social and economic significances that are woven around the record collecting phenomenon. The tales have

previously been elaborated upon in a text focusing upon record collecting, knowledge and economy (Ericsson and Persson, 2016), here they are rewritten in order to highlight both social and economic aspects.

### **3 Tales from the field of record collecting**

#### **3.1 Ohh, you bastard!**

As a student I visit a record fair in the same town where my college is situated. At this particular occasion I am not on the lookout for any specific items. Rather, there is more of a general hunt among the stalls and booths. All around me I can see vendors that display various items that make for a veritable jungle of luscious and tempting phonograms. One of the vendors is JB, a man I know well since he is the main teacher at the program I attend at the university. We have discovered that we have pretty similar tastes in music, and outside the classroom we have often discussed our common interests. Naturally, I immediately pay him a visit and we talk a bit about our expectations. After this I start looking for “goodies”. After a while my eyes discover a box standing beneath one of the stalls. It contains old 78 rpm shellac records from the 1930’s and 1940’s. I address the vendor and he tells me that he has just gotten hold of them. He is quite unsure how to relate to them since he (as most others involved in trading phonograms) usually deal with vinyl records from the late 1950’s onwards. However, he says, I am most welcome to browse through the box!

My eyes almost immediately fixate one of the records and an exited tingle can be felt throughout my body. Candy Rock Mountain by Harry McClintock! In my hands is one of the musical cornerstones in the much acclaimed film *O Brother, Where Art Thou?* by the Cohen Brother – and it is in original format! A small sum changes hands and after buying some additional items I return to JB’s stall. There is usually a bit of ‘show and tell’ when people like us start discussing their purchases. Knowing that JB, just like myself, is a fan of the movie and it’s soundtrack I start to whistle its melody. One can tell that JB recognizes the tune but he struggles to make the right connection. I drag the record out of its bag and make sure that my fingers cover the price tag. Instantly JB moans a bit and says “Oh no, but I was supposed to have that one...” I realize that he blames himself for not discovering the record during the trade that takes place between vendors before the fair opens up to the public.

Spurred by this reaction I don’t let go of the opportunity; of course the question of the price has to be dealt with! I let my fingers slide just a bit so that the number 3 can be seen. “What?! Only three hundred?” JB’s voice has risen a bit and he looks a bit upset. My finger is

then completely removed and only one zero is visible. “Nope, even better, only thirty”. JB then growls, lowers his head and between clenched teeth he mutters: “Oh, you bastard...”

### **3.2 My precious!**

Alone for the weekend, taking a drive in the countryside outside, I stumble upon a flea market set up in an old barn and out of curiosity I decide to pay it a visit. The place is totally jam packed with various stuff in no particular order, but since the owner is readily at hand I ask him if he by chance has any records for sale. He has a vague recollection that he might have some and takes me to one of the darkest corners of the barn. Beneath a pile of rather mingy old rugs is a box. It contains only twenty-something items and it is a fast process of flipping through them. On one of the labels there seems like someone has been scribbling something and in one of the other paper sleeves there seems to be an object of glass or something similar instead of a record. Out of curiosity I pick them up and have a closer look. The one with the scribbled label turns out to be an autographed record by the American vocal group Delta Rhythm Boys. A promising find for sure! Then I take the other one out of its sleeve, and it puzzles me because I have never seen nothing like it. The size and weight indicates that it is a 78 rpm shellac record, but instead of being black it is almost glasslike and has beautiful and stylish motifs of jazz musicians printed on both sides. I must have them! So, when the owner asks for a bit more than his listed price (25 SEK’s each instead of 10) – “because they seem a bit unusual” – I make no effort to haggle.

As I return home I start to google information about the picture disc. Soon I realize that I had done a really good deal as it turns out that it is a Vouge Records Picture Disc in pretty much mint condition. These discs were made between 1946 and 1947 and, though the market price varies, the cheapest and most common ones are usually sold for at least \$50.

Years later, when I visit a record fair, the owner of the flea market is one of the vendors. Even though quite some time has passed he recognizes me as I walk by his stall and bursts out: “It is you! You who bought the Vouge Picture Disc, paying almost nothing! You’ve earned quite a bit, haven’t you. I looked it up later on...” Coming home later that afternoon I bring out the record for a closer look. Holding it in my hands I can’t help laughing as I grin and quote the character Sméagol from Tolkien’s Lord of the Rings:” My precious!”

### **3.3 Finding treasures nearby**

As time goes by, life changes. My girlfriend and I find ourselves buying a house and having two kids. For a while my record collecting activities are put on hold, but every once in a while the urge comes creeping again – as when I realize that my new neighbor Ernst is pondering

about selling his record collection. Ernst harbors a really big interest in music but now finds that his old records are nothing but dust collectors since he started to use Spotify. He says that he knows that his records could bring him some money selling them through the right channels, but he neither has the time nor the will to go through all the hassle that will bring. So, half-jokingly, I suggest that I can take a look at his records and perhaps buy some stuff from him if he sells them cheap enough. We both laugh at this proposal. However, as time passes, perhaps six months or so later, he surprisingly brings up the subject again. He needed time to get adjusted to the thought of parting company with at least parts of his collection.

So, one evening Ernst invites me to go through his collection, mainly LP's containing hard rock from the late 70's early 80's and New Romantic artists from the mid 80's. I start to flip through the records and the first thing that comes to mind is that everything is in absolute pristine condition. When commenting on this, Ernst reveals that he back in the days usually only played a record once or twice, mainly to transfer it onto a tape that he then used for everyday music consumption. Looking at some of the individual items, such as the first four or five Iron Maiden singles in original UK print, I realize that, given the right prize, I will make a deal. I realize that Ernst is a bit uncomfortable with the situation, especially when it comes to pricing the items, so I suggest that instead of haggling over each item I could offer him a sum on the total amount of records – I will, sort of, buy them “in bulk”. Ernst agrees and in the end of the evening I carry some 200 records home, paying 10 SEK each.

Later on we have talked about this situation. It is obvious that I made a really good deal and Ernst has expressed this several times, sometimes with a slight resentment in his voice. But at the same time he says that it was a bit of a relief selling in bulk, since he didn't have to go through all the troubles of finding the right channels or buyers.

### **3 Understanding record collecting**

The described relationship between Patrik and JB is built on a common understanding of the values of the 78 rpm record Candy Rock Mountain. This common understanding is manifesting itself in the desire they both have for the object, in JB's regret of missing out on the deal and in Patrik's teasing and triumphant attitude being the one succeeding.

The reaction of the flea market owner turned vendor shows a different side. When there was only a hunch of the uniqueness of the Vogue Picture Disc, the price went up, but only slightly. He could see that there was something there, but he obviously did not desire the object in itself there and then. Later on, however, when the actual facts of this object had dawned on him, his desires for the object had risen to the level where he begrudged the transaction – this

even happening several years later. In order to fully appreciate market (trans)actions, such as acquiring a multitude of very old records, it in other words seems necessary to know about the objects and what they symbolize. One has to be part of a particular market to understand what having something means to those involved in said market, fully grasping the (trans)actions that stems from the desire to have this “something”.

This finally leads us to the transaction between Patrik and Ernst. In the past, having a record collection has been important to Ernst. The phonograms are a big part of what have constituted him as a musically interested and active person. Parting ways with these objects is not an easy thing for him on a personal level, even though he in reality has already substituted it with a streaming service such as Spotify. It becomes even extra difficult for him because Ernst has got a pretty good picture of the value he is in possession of. However, considering the alternative cost, i.e. spending time and effort orienting himself on a market that he is not that familiar with, he in the end chooses to make more practical deal.

## **Conclusion**

In contrast to perspectives on entrepreneurship solely focusing upon being or becoming, our interpretations lead us to frame entrepreneurship in terms of an overarching having-mode; being a record collector, a.k.a. entrepreneur, requires a desire not only to acquire precious objects but also to have many of them. Metaphorically speaking the phenomenon in this sense could be likened to the rationality of hunters and gatherers – and it is exactly this rationality, we argue, that both characterizes and defines the social becoming of entrepreneurship. On one hand the hunting and collecting of objects is based on economic valuations, on the other hand these valuations perform specific social functions in terms of, for instance, identity construction and status among peers.

The having-mode enables and governs the interactions and transactions between those involved in the field, and could be conceptualized as an epistemic orientation. As such it is based upon three interrelated socio-economic aspects, or requirements.

First of all, in order to be able to understand, compare and categorize a certain object in relation to other objects, a systemic know-what is required that allows the entrepreneur to orient her/himself in the field and to distinguish field-specific values from non-value. Secondly, in order to be able to “make a good deal”, a systemic know-how is required that allows the entrepreneur to distinguish social use value from other types of values, and to identify and act upon possible arbitrage situations by converting the different values in ways that are both socially and economically beneficial to the parties involved. And thirdly, in order to satisfy the

social and economic desire of having, a systemic know-how is required that allows the entrepreneur to create, capitalise upon and accrue field specific surplus value.

The having-mode and its epistemic requirements, we conclude, is crucial for understanding entrepreneurship. Without it, entrepreneurship would be an empty signifier. That is, as long as we follow the movements in entrepreneurship.

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## **ANALYTICAL VIEW OF THE DETERMINANTS THAT AFFECT THE CUSTOMER SATISFACTION IN ACCOMMODATION BUSINESS BASED ON ONLINE CUSTOMER REVIEWS**

**Richard Fedorko – Radovan Bačík – Jakub Horváth**

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### **Abstract**

**Purpose:** The aim of the article is to describe the specific aspects affecting online reputation of Slovak hotels based on customer reviews.

**Design/methodology/approach:** For the purposes of collecting primary data the crucial factor for the selection of hotels was identification of the suitable Tripadvisor rating focused on post-stay evaluation of hotels in Slovakia. Automatic data collection method was used for the observed variables (evaluations) within selected hotels ratings. The total of 19 226 evaluations of 333 hotels were analyzed. The main focus was given to customer overall satisfaction with a hotel in relation with selected variables. Data collection was carried out at the end of 2015. Based on the nature of the variables we used correlation analysis and regression analysis.

**Findings:** The results of the research showed that there exists a direct relation between the overall customer rating and selected variables such as Sleep quality, Rooms, Service and Cleanliness.

**Research/practical implications:** It can be concluded that hotels do not fully exploit the potential of modern marketing communication tools to promote their facilities. We therefore recommend these hotels to invest their time and effort into variables (factors affecting customer satisfaction) that have the ambition to positively influence their online reputation and thus attract new and old customers.

**Originality/value:** The aim of this paper is to help hotels with their marketing strategies so they will better understand the factors that influence customer satisfaction. The analysis was conducted based on the research gap in the studies related to the factors that affect the satisfaction of customers of entities providing accommodation services.

**Keywords:** tourism, marketing communication, hotels, Tripadvisor

**JEL Codes:** M30, M34

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## **Introduction**

The impact of globalization has led to a faster and wider dissemination of technology. The Internet is perceived as a great breakthrough. Consumers now have the opportunity to order products and services they need from the comfort of their own homes (Karlíček – Král, 2011; Bačík et al., 2015). Nowadays it is very important for SME's to succeed in this competitive world, as the market is saturated with different products or services (Higham, 2009; Štefko et al., 2015). The fact is that the online environment of the Internet has an impact on SME's operating in the offline world. The purchasing behavior of consumers is to a great extent influenced by the image of the company, its reputation and its customer rating (Svec et al., 2015; Higham, 2009). Based on the survey conducted by the website Zendesk (2013) we can conclude that 90% of respondents confirmed that customer reviews have affected their decision-making process. Also, 41% of customers said their purchase decisions have been affected by customer reviews on online review sites.

Good reputation and image can be a huge competitive advantage for SME's. Sasko (2014) states that in today's digital age it is very important to have good online reputation. More and more people are searching for reviews and only then decide whether they buy the product or not. With regard to fierce competition, SME's should place greater emphasis on the intangible value of reputation (Özturek et al., 2013; Dorčák et al., 2015). Reputation management creates prerequisites to building long-term competitive advantage (Helm et al., 2011). The main aim of reputational management is to care for companies' image and make a company look customer-oriented (Sasko, 2010).

There are many authors who focus on issues of reputation management, such as Fang et al. (2014). He and his co-authors addressed trust, satisfaction and consumers' intentions regarding repeat purchase in the online environment. The study of Gburová – Matušiková (2016) addressed the potential impact of new trends in marketing on the buying behavior of consumers. Cai et al. (2014) focused on the seller's reputation using word-of-mouth and the subsequent feedback.

## **Methodology**

The analysis deals with online reputation and focuses on the after-purchase customer behavior, specifically the assessment of the quality of the accommodation in the Slovak Republic.

The aim of the analysis was to provide a picture of the state of customer satisfaction based on ratings on online rating portals with regard to entities providing accommodation

services. The aim of the analysis was to describe aspects affecting the assessment of the quality of service.

The first step of the analysis was to identify online rating portals with regard to entities providing accommodation services. The only condition for this research was the completeness of data (absolute values). The rating portals were chosen based on their local popularity, namely the number of active entities providing accommodation services and technical capability for automated data collection of these portals. Based on the selection criteria we have identified one website. The main reason for not involving several websites was insufficient number of ratings, technical incompetence for automatic data collection and non-compatibility of chosen variables with data provided by these websites.

The only website that suited our needs was the website TripAdvisor.com, which is the largest travelers' community in the world. The website is visited by nearly 390 million unique visitors per month, and contains more than 465 million reviews and opinions, covering more than 7 million accommodations, restaurants and attractions (TripAdvisor, 2017). Apart from the main website, TripAdvisor also features TripAdvisor for Business, which is intended for accommodation providers and other service providers operating in the tourism industry. The website allows users to add reviews, book accommodation directly or use analytical tools to monitor selected variables focused on customer satisfaction and engagement, competition, selected geographic area.

The next step in the analysis was to identify the very entities that provide accommodation services and advertise them on this website, and collect data - customer ratings using the method of automatic data collection via the script programming language PHP 5.6.17, MySQL 5.7.10 databases, phpMyAdmin 4.4.15.2 Content Manager MySQL and Apache web server 2.4.16. With the help of the aforementioned technologies a script was created. Its task was to identify and subsequently record the selected monitored variables from within the source code of the sub-pages. These activities were carried out in several stages in November 2015. In this step, we have identified a total of 347 profiles of entities providing accommodation services that were suitable for further analysis.

In the third step of the analysis we verified the variables (reviews) on the profiles of chosen subjects. The objective of this step was to identify the appropriate subjects (accommodation providers) for the subsequent deeper analysis (subjects that had some reviews and were not inactive). As in the previous step, this step also made use of the method of automated data collection using a script. The data collection process took place in the December 2015.

From the data obtained in this step we have identified 333 (95.97%) subjects that had customer reviews and 14 (4.03%) subjects that did not have any customer review, or were inactive on the website. A closer look at the data collected is provided by Table 1 which describes the basic characteristics of the researched set of data.

**Tab. 1: The basic characteristics of the researched set of data**

Number of hotel stars	Number of hotels	Number of hotels in %	Number of reviews	Number of reviews in %	Avg. number of reviews
1 Star	9	2.70%	81	0.42%	9
2 Stars	14	4.20%	90	0.47%	6
3 Stars	171	51.35%	4 610	23.98%	27
4 Stars	130	39.04%	11 102	57.74%	85
5 Stars	9	2.70%	3 343	17.39%	371
<b>Total</b>	<b>333</b>	<b>100.00%</b>	<b>19 226</b>	<b>100.00%</b>	<b>57,74</b>

Source: own elaboration

In the next step of the analysis the sample of 333 subjects providing accommodation services was subjected to further analysis focusing on the following: Number of customer ratings, Overall rating, Sleep Quality, Rooms, Service, Cleanliness.

It was not possible to make a detailed breakdown (data collection) by gender, nationality, type of reviewer (family, business, etc.). The limiting factor was the data collection method - by script.

The analysis of examined variables is based on the total sample of 19,226 customer reviews. The following table describes the average values of the variables examined in terms of the overall assessment of individual hotels.

**Tab. 2: Selected variables rated by customers**

Overall rating	N of hotels	N of reviews	*Sleep quality	*Rooms	*Service	*Cleanliness
1,5	6	18	2,58	1,75	2,17	1,58
2	7	49	2,93	2,50	2,36	3,07
2,5	16	197	3,19	2,63	2,97	3,13
3	31	917	3,66	2,95	3,18	3,34
3,5	77	2350	3,92	3,61	3,60	3,94
4	98	4545	4,24	4,01	4,04	4,33
4,5	84	9062	4,48	4,49	4,49	4,64
5	14	2088	4,57	4,71	4,82	4,82
<b>Total</b>	<b>333</b>	<b>19226</b>	<b>4,08</b>	<b>3,83</b>	<b>3,88</b>	<b>4,11</b>

\*Average rating values; Source: own elaboration

## Results

The following part of the paper is devoted to the results of the correlation analysis that was aimed at identifying dependencies between the variables (Sleep quality, Rooms, Service, Cleanliness and Overall Rating). The following hypotheses were thus formulated:

**H<sub>1</sub>:** We assume that there is a statistically significant difference between the Overall rating and Sleep quality.

**Tab. 3: Correlation analysis (rating based on the Sleep quality)**

Overall rating * Sleep quality	Sig. (P value)	Level of dependence
Kendall's tau-c	0,000	,544
Gamma	0,000	,761

N=333; Source: own elaboration

Based on the output p values we would accept the basic hypothesis that there is a statistically significant dependence between the Overall rating and the Quality of sleep. The output of the correlation coefficient T is characterized as a significant and very strong and  $\Gamma$  shows us a very strong degree of association. It can be stated that there is a significant degree of dependence between the Overall rating and the Quality of sleep.

**H<sub>2</sub>:** We assume that there is a statistically significant dependence between the Overall rating and the quality of Rooms.

**Tab. 4: Correlation analysis (evaluation based on the quality of Rooms)**

Overall rating * Rooms	Sig. (P value)	Level of dependence
Kendall's tau-c	0,000	,671
Gamma	0,000	,883

N=333; Source: own elaboration

Based on the output values of p, we would accept the basic hypothesis that there is a statistically significant dependence between the Overall rating and the quality of Rooms. The output of the correlation coefficient T is characterized as a significant and very strong rate and  $\Gamma$  shows us a very strong degree of association (both values are at the border intervals of the high level of dependence). It can be stated that there is a significant degree of dependence between the Overall rating and the quality of Rooms.

**H<sub>3</sub>:** We assume that there is a statistically significant dependence between Overall rating and the Quality of Hotel Services.

**Tab. 5: Correlation analysis (evaluation based on the Quality of Hotel Services)**

Overall rating * Services	Sig. (P value)	Level of dependence
Kendall's tau-c	0,000	,777
Gamma	0,000	,914

N=333; Source: own elaboration

Based on the output values of p, we would accept the basic hypothesis that there is a statistically significant dependence between the Overall rating and the Quality of Hotel Services. The quantification of the correlation coefficient T shows us a very strong association, and the correlation coefficient  $\Gamma$  has almost a perfect rate.

**H<sub>4</sub>:** We assume that there is a statistically significant dependence between Overall rating and the Cleanliness.

**Tab. 6: Correlation analysis (based on Cleanliness of the hotel)**

Overall rating * Cleanliness	Sig. (P value)	Level of dependence
Kendall's tau-c	0,000	,586
Gamma	0,000	,812

N=333; Source: own elaboration

P values in this case equal to 0.000. We are inclined to accept the basic hypothesis - there is a statistically significant dependence between the Overall rating and the Cleanliness. The output of the correlation coefficient T is characterized as a significant and very strong rate and  $\Gamma$  shows us a very strong degree of association. It can be stated that there is a significant degree of dependence between the Overall rating and the Cleanliness.

The research also featured a regression analysis using elements of satisfaction (Hotel location, Sleep quality, Rooms, Service, Value, Cleanliness) as independent variables and overall satisfaction as a dependent variable. In order to be completely accurate, it is necessary to determine whether the analyzed set is homoskedastic or heteroskedastic. In order to find out we will use the Breusch-Pagan hypothesis test:

**H<sub>5</sub>:** Heteroskedasticity is not present, the analyzed set is homoskedastic.

**Tab. 7: Correlation analysis (based on Cleanliness of the hotel)**

Test	LM	Sig
Breusch-Pagan	65,985	0,000

Source: own elaboration

The p value is less than 0.05, therefore we are inclined to reject H5, heteroskedasticity is present. We will investigate the significance level of using the bootstrap. The following table shows the ANOVA test output for the intended model. Based on the results we will decide whether to accept or reject the following hypothesis:

**H<sub>6</sub>:** The model is not statistically significant.

**Tab. 8: ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	145,278	6	24,213	279,983	,000 <sup>b</sup>
	Residual	28,192	326	,086		
	Total	173,470	332			

a. Dependent Variable: Overall rating; b. Predictors: (Constant), Hotel location, Sleep quality, Rooms, Service, Value, Cleanliness; Source: own elaboration

The last row shows the value p (asymptomatic signification), which is less than 0.05. Therefore we are inclined to reject the H6 hypothesis and accept the alternative that indicates the significance of the model.

**Tab. 9: Bootstrap for Coefficients**

Model		B	Bootstrap <sup>a</sup>				
			Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
						Lower	Upper
1	(Constant)	-,357	-,017	,179	,047	-,710	-,010
	Hotel location	,122	-3,392E-5	,030	,001	,060	,178
	Sleep quality	,163	,001	,049	,002	,066	,260
	Rooms	,228	,002	,045	,001	,143	,317
	Services	,361	,002	,045	,001	,274	,448
	Value	,185	-,003	,047	,001	,092	,271
	Cleanliness	,003	,002	,046	,944	-,091	,094

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples; Source: own elaboration

$$\text{Overall rating } i = -0,375i + 0,122 * \text{Hotel\_location } i + 0,163 * \text{Sleep\_quality } i + 0,228 * \text{Rooms } i + 0,361 * \text{Service } i + 0,185 * \text{Value } i + u_i$$

First, let's look at the p value which tells us about the significance of the given coefficient. As can be seen, all independent variables except hotel cleanliness are statistically significant, the variable cleanliness is not included in the model.

## Conclusion

Online customer reviews and the issue of building positive online reputation with regard to SME's are important parts of online as well as offline promotion. Customers are the basis of trade as such. From this point of view reputation has an immense impact on SME's and also business as such. Also, it can be concluded that reputation largely affects how customers perceive SME's and how this perception influences their purchasing decisions.

The issue of reputation should be taken very seriously since it is really easy to lose good reputation due to negative customer reviews.

One of the limitations of our research is the absence of a more in-depth analysis of Tripadvisor.com data contained in reviews, like gender, nationality, type of reviewer (family, business, etc.) due to the nature of the method of automated data collection.

It can be concluded that hotels, as parts of SME's, do not fully exploit the potential of modern marketing communication tools to promote their facilities. Therefore, based on the results of our analysis, we suggest that hotel managers should invest their time, effort and funds into variables that have the ambition to directly affect the satisfaction of their customers. The above-mentioned efforts and the active use of online services such as Tripadvisor.com give hotels chance to positively influence their reputation and thus attract both new and old customers, as well as increase competitiveness of the entity.

## Acknowledgment

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## THE ANALYSIS OF THE IMPORTANCE OF ONLINE AND OFFLINE MARKETING COMMUNICATION TOOLS WHEN SEARCHING FOR BUSINESS ENTITIES FROM THE POINT OF VIEW OF CONSUMERS

Richard Fedorko – Radovan Bačík – Jakub Horváth – Ján Mihál

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### Abstract

**Purpose:** The aim of the article is to find out how customers perceive online and offline communication channels SME's use to communicate with their target audience in online and offline environments alike and how such communication affects behaviour of their consumers.

**Design/methodology/approach:** The aim was to identify attitudes and preferences of the respondents in relation to the traditional (offline) forms of marketing communication and internet (online) forms of marketing communication focusing on SME's. The primary source was data collected from questionnaires filled out by inhabitants of eastern region of Slovakia. We have reached out to 1,055 respondents of which 987 subsequently featured in our analysis. Data collection was conducted through simple random sampling in October and November 2016. To verify the hypotheses, we used the software STATISTICA. Due to the nature of the analyzed variables we used two-tailed Wilcoxon test.

**Findings:** The results of the research showed that the difference between offline and online sources of information with regard to the influence of the information carrier, the usefulness of information carriers when searching for service providers and the usefulness of information carriers when obtaining information about service providers is purely accidental in nature and not statistically significant. Generally, it can be stated that a total of 72.44% of the respondents prefer getting information about products and services on the Internet or using online marketing tools.

**Research/practical implications:** The results of our research are relevant to SME's who are skeptical towards the online environment of the Internet and marketing communication conducted within it. The research results should help SME's to decide on the strategic direction of their marketing communication. Moreover, the results show that online marketing tools are easily accessible and more efficient in terms of time and finances than conventional marketing tools.

**Originality/value:** The aim of this paper is to help clarify the impact the selected promotion tools have when reaching target audiences of SME's. The analysis was conducted based on the research gap in the studies related to SME's online and offline marketing communication.

**Keywords:** marketing communication, online environment, offline environment, consumer behavior

**JEL Codes:** M31, M37

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## **Introduction**

Communication plays a very important role in human life, it is almost essential. The same applies to the business world where especially small and medium-sized enterprises (SME's) have to implement marketing communication activities in order to succeed in today's hyper-competitive environment. Kotler and Keller (2007) point out that small and medium-sized enterprises should not think about whether to communicate but rather how to communicate, with whom to communicate and how often. The answer to these questions is simple - marketing communication. Marketing communication uses communication methods and means by which it presents the companies and their products to already existing and potential customers, and thus ultimately helps to satisfy consumer needs (Grancay et al., 2015; Bačík et al., 2015; Hradiská, 2010). Currently, social change and continuous innovation in the field of communication technologies significantly affect and influence the development of marketing as well as marketing communication (Gerrikagoitia et al., 2015). Příkrylová (2010) states that when a company fails to adapt to rapidly changing technology and market, in most cases its sales decrease, which often leads to liquidation of the company. On the other hand, some companies are open to new possibilities and are not afraid to experiment with new strategies, are more efficient and flexible when addressing their target groups (Constantinides, 2014; Hajdu et al., 2014). In general it can be stated that with the advent of the Internet a new space to promote products, services or brands has opened up, thus allowing companies to create new dimensions while reaching out to their customers (Scott, 2010). The amount of investments needed for marketing activities in the online environment is much lower than in case of other forms of promotion (Scott, 2010).

According to the survey by eMarketer (2016) global advertising expenditures in 2016 amounted to 571.36 billion EUR. In 2017 these expenses are expected to increase by 6%. Until 2019 these expenses are projected to grow by an average of 5.83% per year. Of the total advertising expenditures, expenditures on digital advertising in 2016 accounted to 67.12 billion EUR, which is around 35.8%. Classic offline advertising in print (newspapers, magazines) represented a share of 13.9%. Other traditional forms of advertising influencing people outside their home accounted for 3.9% and direct-addressing advertising accounted to 2.2% of total expenditure on advertising. It is worth noting that since expenditure on classic / offline advertising should in the period from 2017 to 2020 decline, according to eMarketer (2016), spending on digital ads will increase by 2.28% each year. In 2017, the spending on digital advertising compared with television advertising is projected to reach the ratio of 77.17 billion EUR to 67.73 billion EUR (eMarketer, 2016). Based on the breakdown of expenditure by

region, our region (Central and Eastern Europe) is at the level of spending 12.74 billion EUR per year. eMarketer (2016) projected an increase in this year's ad budget to 13.09 billion EUR, which represent an annual increase of 2.7%.

This issue has been studied across several fields, for example by Klabíková Rabová (2015) in the study "Marketing communication of SMEs specialized in cosmetic industry", as well as by Khoshnodifar, Ghonji, Mazlounzadeh a Abdollahi (2016) in their case study "Effect of communication channels on success rate of entrepreneurial SMEs in the agricultural sector", and "SME practice towards integrated marketing communications" by Balboni and Gabrielli (2010).

Based on the facts described above, the main purpose of the article is to find out how customers perceive online and offline communication channels service providers use to communicate with their target audience in online and offline environments and how such communication affects behaviour of their consumers.

## **1 Methodology**

Our research is based on the material obtained from primary sources - questionnaires. The basic set of respondents consists of inhabitants of Eastern Slovakia who can be identified as the main target group of SME's operating in the given region. The basic set of respondents for the quantitative research consists of the population of the East Slovakian region. In order to gather data respondents were randomly approached in person in selected parts of Košice and Prešov region. Data collection was carried out also in an electronic form using the online tool Google Forms. The questionnaire was sent to the respondents with their consent to the available e-mail addresses. We interviewed 1,055 respondents, and subsequently included 987 (93.55%) of them (the rest of questionnaires were not complete). The response rate in the case of electronic questionnaire was only 15%, i.e. the questionnaire was filled out by 215 potential respondents. Data collection for the main research took place in October - November 2016.

The aim of the questionnaire was to identify the attitudes and preferences of the respondents in relation to the issues analyzed in the research. Specifically, the aim was to identify the attitudes and preferences of the respondents in relation to traditional (offline) forms of marketing communication (i.e. traditional information sources - advertising billboards, advertising newspapers, leaflets, advertising in TV, advertising on radio, advertising in newspapers) and the new form of marketing – on the Internet (online) (websites, online catalog catalogues of companies, Internet advertising, discussions, company blogs, profiles on social networks), focusing on SME's.

Given the additional mathematical and statistical problem-solving processes the questionnaire's items were accompanied by the Likert scale. The set hypotheses were verified using the statistical program StatSoft STATISTICA. On the basis of the file size and the very nature of the raw data and the analyzed variables we opted for two-tailed Wilcoxon test.

The results of the questionnaire survey showed that 48.53% of respondents were women and 51.47% men. The age structure of the examined respondents was as follows: respondents aged 18-25 years accounted for 21.28%, respondents aged 26-30 years accounted for 13.78%. Just to provide a wider view it should be noted that that respondents aged 18-35 years represented a share of 46.61%, respondents aged 36-45 years represented a share of 21.38%, respondents aged 46-55 represented a share of 20.87% and respondents aged 56-60 years represented a share of 11,14%. With regard to education the largest group consisted of respondents with secondary education without school-leaving exam, they accounted for 31.51%. The proportion of respondents with complete secondary education amounted to 28.37%. Respondents with bachelor's degree accounted for 20.77%. Respondents with master's degree accounted for 19.35%.

## 2 Results

The aim of the research was to check whether there is a statistically significant difference between traditional and Internet information carriers in selected areas in terms of perception of the people. In this case, the tests were carried out at a significance level of 0.05 and two-tailed Wilcoxon test was used. The first variable used in the test was the level to which respondents are influenced by traditional and online information sources. In order to see the full picture we have formulated the following partial hypotheses:

- **H<sub>0</sub>**: We assume that the difference between classic (offline) and online sources of information with regard their influence on customers is not statistically significant, the differences are just coincidental ( $\eta = \eta$ ).
- **H<sub>1</sub>**: We assume that the difference between classic (offline) and online sources of information with regard their influence on customers is statistically significant ( $\eta \neq \eta$ ).

**Tab. 1: Wilcoxon signed ranks test**

Variable A - Variable B	N	Mean Rank	Sum of Ranks
Negative Ranks	282 <sup>a</sup>	843,90	229541,00
Positive Ranks	705 <sup>b</sup>	360,89	258037,00
Ties	0 <sup>c</sup>		
<b>Total</b>	<b>987</b>		

Variable A - the extent to which online information carriers influence respondents; Variable B – the extent to which classical information carriers influence respondents; Variable A < Variable B; b. Variable A > Variable B; c. Variable A = Variable B; Source: Own processing

**Tab. 2: Wilcoxon signed ranks test (Asymp. Sig.)**

Variable	Variable A - Variable B
Z	-1,591 <sup>a</sup>
Asymp. Sig. (2-tailed)	,112

Variable A - the extent to which online information carriers influence respondents; Variable B - the extent to which classical information carriers influence respondents; and. Based on negative ranks; Source: Own processing

P value shown in the above Table equals to 0.112. That shows that the hypothesis H0 should be accepted and H1 rejected. The files were analyzed by the modern method of p-value comparison, the asymptotic significance. The confidence level determined to be at the level 0.05. Since the p-value is higher than the level of significance, we are inclined to accept the opinion that the difference between classic and online sources of information with regard to their influence on customers is not statistically significant; the differences (if any) are just accidental.

Another researched variable was the perceived rate of the usefulness of classic and online information sources when searching for SME's. In order to see the full picture we have formulated the following partial hypotheses:

- **H<sub>0</sub>**: We assume that the difference between classic and online sources of information from the point of view of the usefulness of information carriers when searching for SME's is not statistically significant, the differences are just accidental ( $\eta = \eta$ ).
- **H<sub>1</sub>**: We assume that the difference between classic and online sources of information from the point of view of the usefulness of information carriers when searching for SME's is statistically significant ( $\eta \neq \eta$ ).

**Tab. 3: Wilcoxon signed ranks test**

Variable A -Variable B	N	Mean Rank	Sum of Ranks
Negative Ranks	272 <sup>a</sup>	843,09	229320,50
Positive Ranks	715 <sup>b</sup>	361,20	258257,50
Ties	0 <sup>c</sup>		
<b>Total</b>	<b>987</b>		

Variable A – The rate of usefulness of information carriers when searching for SME's; Variable B - the rate of usefulness of online information carriers when searching for SME's; a. Variable A < Variable B; b. Variable A > Variable B; c. Variable A = Variable B; Source: Own processing

**Tab. 4: 1 Wilcoxon signed ranks test (Asymp. Sig.)**

Variable	Variable A - Variable B
Z	-1,615 <sup>a</sup>
Asymp. Sig. (2-tailed)	,106

Variable A - The rate of usefulness of classic information carriers when searching for SME's; Variable B - The rate of usefulness of online information carriers when searching for SME's; a. Based on negative ranks; Source: Own processing

The above table shows us the value of the output - the asymptotic significance of 0.106. When compared with the set level of significance (0.05), the value suggests we should adopt the hypothesis H<sub>0</sub> and reject the hypothesis H<sub>1</sub>. We are inclined to state that the difference between classic and online sources of information from the point of view of the usefulness of information carriers when searching for SME's is not statistically significant, the differences are just accidental.

The third variable was the usefulness rate of classic and online information sources when searching for information on SME's. In order to see the full picture we have formulated the following partial hypotheses:

- **H<sub>0</sub>**: We assume that the difference in the usefulness rate of classic and online information sources when searching for information on SME's is not statistically significant, the differences are just accidental ( $\eta = \eta$ ).
- **H<sub>1</sub>**: We assume that the difference in the usefulness rate of classic and online information sources when searching for information on SME's is statistically significant ( $\eta \neq \eta$ ).

**Tab. 5:2 Wilcoxon signed ranks test**

Variable A - Variable B	N	Mean Rank	Sum of Ranks
Negative Ranks	277 <sup>a</sup>	842,23	229087,00
Positive Ranks	710 <sup>b</sup>	361,53	258491,00
Ties	0 <sup>c</sup>		
<b>Total</b>	<b>987</b>		

Variable A - the usefulness rate of classic information sources when searching for information on SME's; Variable B - the usefulness rate of online information sources when searching for information on SME's; a. Variable A < Variable B; b. Variable A > Variable B; c. Variable A = Variable B; Source: Own processing

**Tab. 5:3 Wilcoxon signed ranks test (Asymp. Sig.)**

Variable	Variable A - Variable B
Z	-1,641 <sup>a</sup>
Asymp. Sig. (2-tailed)	,101

Variable A - the usefulness rate of classic information sources when searching for information on SME's; Variable B - the usefulness rate of online information sources when searching for information on SME's; a. Based on negative ranks; Source: Own processing

P value shown in the table equals to 0.101. That implies that the hypothesis H0 should be accepted and H1 rejected. The files were analyzed by the modern method of p-value comparison, the asymptotic significance. The confidence level determined to be at the level 0.05. Since the p-value is higher than the level of significance, we are inclined to accept the opinion that the difference between classic and online sources of information with regard to their influence on customers is not statistically significant - the differences are just accidental.

## Conclusion

SME's marketing communication is an important area of knowledge given the current highly competitive environment both in domestic conditions as well as on the world's stage. It should be noted that given the influence of the rapid development of information technology, it is possible to identify changes in the preferences of target audiences – how consumers search for information about products and services. On the other hand it should be noted that the market is full of advertising content which is being consumed by consumers every day.

The current state of the research problem shows that total advertising spending is growing from year to year and this trend will continue in the future as well. Online advertising has surpassed television advertising in terms of expenses and, although spending on advertising

increases annually, spending on online advertising grows much faster. The region of Central and Eastern Europe (Slovakia and the neighboring Czech Republic) assumed a share of total advertising expenditure in the amount of € 13.09 billion, which represents just over 2%.

The results of our research are relevant to SME's who are skeptical towards the online environment of the Internet and marketing communication conducted within it. The research results should help SME's to decide on the strategic direction of their marketing communications since online marketing tools that are easily accessible and more efficient in terms of time and finances. The most significant advantage of the online environment is its complex measurability of results achieved within the framework of implemented activities.

There are also possible limitations of our research. In particular, there is a possibility that respondents in their answers did not describe how they really perceive the influence various forms of marketing communication in question have on them. It can also be assumed that respondents aged 50 and over may have a problem with recognizing some online marketing communication tools. A possible solution is to implement contingency questions in relation to customers' knowledge of marketing communication tools.

Finally, it should be noted that the implementation and understanding of online marketing tools as part of marketing activities and strategies of SME's in the long run are also an undeniable competitive advantage. Specifically, the knowledge of current trends and practices in marketing communication is a crucial advantage for SMEs with regard to their future development.

## **Acknowledgment**

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## THE IMPACT OF SELECTED CHANGES IN BUSINESS ENVIRONMENT ON SMALL ENTERPRISES IN THE CZECH REPUBLIC

Vendula Fialová – Andrea Kolková – Andrea Folvarčná – Radim Maňák

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### Abstract

**Purpose:** This article aims to explore the impact of selected factors of development in business environment on numbers of entrepreneurs doing business as main and secondary activity in the Czech Republic. To the chosen factors of entrepreneurial environment belong especially amount of average wage, amount of advances on social and health insurance, unemployment. The aim of the research is to demonstrate that changes in the aforementioned factors are associated with the development of numbers of entrepreneurs who do business as main and secondary activity, including a comparison in the various regions of the Czech Republic, especially in the Moravian-Silesian Region.

**Design/methodology/approach:** This article aims to demonstrate the impact and the statistical dependence of selected factors on the state of business environment and the number of entrepreneurs entering into business as main and secondary activity and to find out why the number of full-time entrepreneurs has been steadily declining in the Czech Republic. The statistical data used for the research are from the years 2009 to 2016 and came from the Czech Statistical Office, from and the Czech Social Security Administration and General Medical Insurance. The research methods of regression and correlation analysis have been used to analyse the aforementioned data.

**Findings:** The article did not unequivocally prove the connection between number of entrepreneurs conducting business as their main and secondary activity and the average wage, rate of unemployment, and the amount of social security and health insurance payments. Mutual ties were identified in Moravian-Silesian region as well as in the Czech Republic.

**Research/practical implications:** The research points to how the changes in business environment affect number of self-employed people and how they may have a long-term effect on the willingness of people to start their own businesses. Given the diversity and multitude of influences of business environment, other effects should be explored and compared in the future in order to stop this decrease in number of self-employed people who conduct business as their main activity and prevent a possible lack of entrepreneurs in the future.

**Originality/value:** The article opens up new perspectives on the development in the number of entrepreneurs in the Czech Republic and factors which can have an influence on the willingness of people to enter into business whether it be their main or secondary activity.

**Keywords:** Entrepreneur, average wage, unemployment, social and health insurance

**JEL Codes:** M10, M13, L26

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## **1 Entrepreneurs, self-employed persons and categories of self-employed persons**

The entrepreneur environment in the Czech Republic changes dynamically especially towards small entrepreneurial subjects such as self-employed persons. Measures adopted by state administration in the Czech Republic primarily in the last three years (starting from year 2014) affect selectively entrepreneurial subjects in the Czech Republic. Above all, a significant administrative stress is aimed at small companies primarily towards self-employed persons. The mentioned trend is in accordance with the development in some EU countries but it concerns rather pragmatic measures implemented with the intention of increasing the tax collection rather than theoretical knowledge of the fields such as entrepreneurship, business economics and the like. First of all, it is necessary to formulate contemporary conception of terms so that the discussion about the self-employed persons is factual and expert based.

In the first chapter, the basic terms i.e. entrepreneur and self-employed person are defined with regard to contemporary literature and legislation. Further, their number, development and individual categories of self-employed persons are analysed.

### **1.1 Entrepreneur**

Entrepreneur is differently seen by economists, psychologists, businessmen and politicians. In the Czech code No. 89/2012, Civil Code, an entrepreneur is understood as someone who independently practices a wage-earning activity on his own account and responsibility in trade or similar way with the intention to do it continuously and in order to achieve profit.

It means that according to valid Civil Code, an entrepreneur is a person or a legal entity i.e. companies, cooperatives etc. The social aspect of entrepreneurship seems to be lost in the definition provided in the code.

An entrepreneur can be identified as a person who has his qualities, abilities and a set of characteristic traits as also Srpová and Řehoř (2010) state.

Self-employed persons who belong to the group of small enterprises are a specific case of entrepreneurs regarding the character and a distinct one regarding the number of subjects.

### **1.2 Definition and categories of self-employed persons**

The code no. 155/1995, about pension scheme, as subsequently amended, considers as a self-employed person someone who:

- practices self-employment or

- cooperates by performance of self-employment if according to code no. 586/1992, about income taxes, as subsequently amended, the incomes reached by the performance of this activity and expenses spent on their achievement, ensuring and maintaining can be divided on this person,
- finished compulsory education and reached at least 15 years of age.

Since the 1.1.2014 the self-employment has been divided into main self-employment and secondary self-employment.

Secondary self-employment is defined in provision of § 9 subsection 6 of code about pension scheme (Česká správa sociálního zabezpečení, 2016).

It is necessary to mention that the above mentioned legal framework fundamentally influences the entrepreneurship of self-employed persons. A totally problematic legal framework results in disparities in the perception of this group of entrepreneurial subjects by state administration and also self-governments, courts, etc.

### **1.3 The development of the number of entrepreneurs and self-employed persons in the Czech Republic**

In the last years changes in numbers of entrepreneurs in the Czech Republic can be noticed. Although the total number of self-employed persons has increased in the last 7 years; however, under closer inspection of the structure of self-employed persons, it can be noticed that the number of the secondary activity self-employed persons has increased at the expense of those who have self-employment as a main activity.

In 2009 the percentage of persons with a main activity self employment was 65.55% and of persons with secondary activity self-employment 35.45%, in 2016 the decrease of persons with main activity self-employment to 58.69% was apparent and contrarily there was an increase of persons with secondary activity self-employment to 41.3%.

It is more apparent in some regions, an example is Moravian-Silesian Region which was chosen as an example of earlier structurally affected region and because it is where the authors are from, where since 2009 the number of secondary activity self-employed persons has increased from 35.25% to 42.12% and the number of persons with main activity self-employment decreased from 64.75% to 57.87%.

More detailed data is presented in the Table 1.

**Tab. 1: The development of the number of main and secondary activity entrepreneurs in the Czech Republic and the Moravian-Silesian Region**

	Czech Republic				Moravian-Silesian Region			
	main	secondary	main %	second. %	main	second.	main %	second. %
Self-employed 2016	590,532	405,734	59.27%	40.73%	51,977	37,829	57.88%	42.12%
Self-employed 2015	578,544	397,408	59.28%	40.72%	50,446	37,251	57.52%	42.48%
Self-employed 2014	586,112	386,244	60.28%	39.72%	51,304	36,217	58.62%	41.38%
Self-employed 2013	602,395	374,833	61.64%	38.36%	53,466	35,069	60.39%	39.61%
Self-employed 2012	627,596	366,492	63.13%	36.87%	56,017	34,556	61.85%	38.15%
Self-employed 2011	649,990	351,774	64.88%	35.12%	58,362	33,300	63.67%	36.33%
Self-employed 2010	640,406	336,663	65.54%	34.46%	58,215	31,699	64.75%	35.25%
Self-employed 2009	648,941	306,718	67.91%	32.09%	59,114	28,737	67.29%	32.71%

Source: Česká správa sociálního zabezpečení (2017)

## 2 Development of chosen factors of entrepreneurial environment

Above stated changes in the numbers of self-employed persons are influenced by development of variety of entrepreneurial environment factors in the Czech Republic and Moravian-Silesian Region. These factors are an average wage, rate of unemployment, and minimum advances on social security and health insurance.

The average wage increases constantly. Between the years 2009 and 2015 it increased from 23,488 CZK to 26,467 CZK in the Czech Republic. In the Moravian-Silesian Region, the development was analogous and an average wage increased from 23,873 CZK to 24,208 CZK.

General rate of unemployment is calculated as ratio of unemployed persons to total work force (in percentage). Unemployment in the Czech Republic decreases, the general rate of unemployment decreased from average 6.7% in 2009 to 5% in 2015.

The Moravian-Silesian Region is traditionally the region where the unemployment rate is higher; it comes out of history, structural changes and region orientation. But also in this region, a moderate decrease of unemployment rate from 9.7% in 2009 to 7.7% in 2015 is apparent.

As apparent from the following tables, minimum monthly advances on social security and health insurance of self-employed persons increase from year to year. In 2016 the minimum advance on social security increased to 1,972 CZK for main activity and to 789 CZK for secondary activity. In 2016 the minimum assess base for social security for main activity was 81,024 CZK and in the case of for secondary activity, it reached 32,412 CZK.

The amount of monthly advances on health insurance and minimum assess base for health insurance show the same increasing trend as in 2016 the minimum advance was 1,823 CZK and the minimum assess base was 13,503 CZK. Statistical indicators of the mentioned

quantities are presented in the Tables 2 and 3. It is important to accentuate that the performed analysis is highly limited by the amount of observations and the conclusions must be interpreted with a caution.

**Tab. 2: Statistical indicators of quantities in the Moravian-Silesian Region**

	Moravian-Silesian Region					
	Number of entrepreneurs as a main activity	Number of entrepreneurs as a second. activity	Average wage in CZK	Unempl.	Social insurance in CZK	Health insurance in CZK
Mean	54,862.625	34,332.25	24,450.3894	8.98%	1,852.5	1709,75
Median	54,741.5	34,812,5	24,504.5	9.40%	1,876.5	1722,5
Minimum	50,446	28,737	23,873.4379	6.97%	1,720	1590
Maximum	59,114	37,829	24,908	10.20%	1,972	1823
Standard deviation	3,266.08703	2,832.796	331.133996	1.06%	86.67324	80,30839

Source: own calculation

**Tab. 3: Statistical indicators of quantities in the Czech Republic**

	Czech Republic					
	Number of entrepreneurs as a main activity	Number of entrepreneurs as a second. activity	Average wage in CZK	Unempl.	Social insurance in CZK	Health insurance in CZK
Mean	615,564.5	365,733.3	25,231.125	0.064125	1,852.5	1,709.75
Median	614,995.5	370,662.5	25,118.5	0.067	1,876.5	1,722.5
Minimum	578,544	306,718	23,488	0.05	1,720	1,590
Maximum	649,990	405,734	27,720	0.073	1,972	1,823
Standard deviation	27,611.12068	30,883.17	1,299.64076	0.007557	86.67324	80.30839

Source: own calculation

### 3 Analysis of development of entrepreneurial environment and development of number of entrepreneurs

The above stated tables show how the numbers of main activity and secondary activity entrepreneurs change gradually. The goal of the analysis is to prove statistical dependence of chosen factors of entrepreneurial environment – particularly the amount of an average wage, the amount of minimum advances on social security and health insurance, and unemployment – on number of entrepreneurs entering the business as their main or secondary activity.

#### 3.1 Analysis of number of small entrepreneurs in Moravian-Silesian Region

Data were tested by regression analysis. A simple linear regression equation was used. The initial regression model equation was in the usual form,

$$Y = \alpha + \beta_1 X + \beta_2 X + \beta_3 X + \beta_4 X + \varepsilon, \text{ where} \quad (1)$$

$\alpha$  is absolute parameter or quotient,  $\beta$  is regression quotient expressing dependence of the change of value of Y on the changes of X. The statistical importance of individual regression parameter was tested. Those tests are based on T-test and P value test. In case, that quotient  $\alpha$  is statistically unimportant, the regression model was modified to:

$$Y = \beta_1 X + \beta_2 X + \beta_3 X + \beta_4 X + \varepsilon. \quad (2)$$

A close tie between the development of number of entrepreneurs and development of gross wage is clear from the results.

Individual dependences and the multicollinearity of individual parameters were tested. According to the results of statistical tests the indicators of social and health insurance were defined as statistically insignificant and were excluded from the test in all tested dependences. It is possible to formulate a conclusion that the amount of social and health insurance doesn't influence the number of small entrepreneurs in the Czech Republic and Moravian-Silesian Region and the entrepreneurship as main and secondary activity.

First the formula (1) was used and the quotient was tested. The parameter  $\alpha$  is not statistically important and so the regression function had to be transformed to formula (2).

The model as a whole was again tested by F-test and it is statistically significant. The results in the table show that average wage is significantly statistically dependent on number of main activity entrepreneurs in Moravian-Silesian Region. This dependence is directly related. The dependence of the rate of unemployment on number of small entrepreneurs doing business as main activity is statistically significant, too. It is possible to define the regression dependence of number of entrepreneurs doing business as a main activity, amount of average wage and the rate of unemployment by the equation:

$$Y = 1,3084X_1 + 2543,766X_2 + \varepsilon, \text{ where} \quad (3)$$

$X_1$  is the average wage and  $X_2$  is the rate of unemployment, with R-squared being 99,9%.

On the basis of this regression the dependence of average wage and number of entrepreneurs doing business as secondary activity can be defined as statistically significant. T-test showed a statistically insignificant relation for unemployment although the coefficient could be accepted on the basis of P-value. The result is therefore ambiguous and this variable will be excluded from the model. The final equation can be written in the form:

$$Y = 1,4049X_1 + \varepsilon, \quad (4)$$

with R-squared 99,7%.

### 3.2 Analysis of number of entrepreneurs in the Czech Republic

The relation to average wage and rate of unemployment is again deemed statistically significant in analysis of small entrepreneurs doing business as main activity. This relation can be defined by:

$$Y = 11,89845X_1 + 4910111X_2 + \varepsilon, \text{ where} \quad (5)$$

$X_1$  represents the average wage and  $X_2$  the rate of unemployment, with R-squared being 99,9%. It is obvious that with increasing unemployment increases the number of entrepreneurs in the Czech Republic. On the other hand increasing average wage results in decreasing number of small entrepreneurs doing business as a main activity.

The relation to unemployment is again statistically insignificant on the basis of T-test by the analysis of small entrepreneurs doing business as a secondary activity. The relation between number of small entrepreneurs doing business as a secondary activity and the amount of average wage is given by the formula:

$$Y = 14,5157X_1 + \varepsilon, \quad (6)$$

with R-squared being 99,8%. Also in this case, both models were tested with F-test and they are as a whole statistically significant.

## 3 Discussion

Analysed data were examined by regression analysis and the research focused on searching the dependence between number of entrepreneurs doing business as a main activity and chosen quantities and between number of entrepreneurs doing business as a secondary activity and the same quantities. The results of the regression analysis prove the dependence of some examined factors.

The presented research showed how the numbers of small entrepreneurs in the Czech Republic and in the Moravian-Silesian Region change in accordance with individual parameters. Individual relations to specific indicators differ more by a main and secondary activity than by a region the persons do business in. The relation of unemployment and amount of average wage is significant for small entrepreneurs doing business as a main activity. The numbers of small entrepreneurs doing business as a secondary activity are influenced by the amount of average wage from the chosen parameters. The results are summarized in the Table 4.

**Tab. 4: Statistical significance of impact of chosen factors on small entrepreneurs in the Moravian-Silesian Region and in the Czech Republic**

	Model 1	Model 2	Model 3	Model 4
	Moravian-Silesian Region		Czech Republic	
	Number of small entrepreneurs doing business as a main activity	Number of small entrepreneurs doing business as a secondary activity	Number of small entrepreneurs doing business as a main activity	Number of small entrepreneurs doing business as a secondary activity
Average wage	1.3084* (-0.568)**	1.4049* (-0.66)**	11.8984* (-0.847)**	14.5157*+ (-0.93)**
Unemployment	2,543.766* 0.733**	- not proven	4,910.111* 0.75**	- not proven
Amount of social insurance	not proven	not proven	not proven	not proven
Amount of health insurance	not proven	not proven	not proven	not proven
R-squared	99.9%	99.7%	99.9%	99.8%
F-statistic	1,524.4302	1,274.136	1,725.356	4,281.203
T-test coefficient of average wage	3.966	35.695	4.600	65.43
T-test coefficient of unemployment	2.852	-	4.852	-
T-critical	2.447	2.447	2.447	2.447

\*coefficient, \*\*correlation

Source: own calculation

As presented in the Table 4, the average wage has indirect impact on number of entrepreneurs. An interesting finding is that this relation is weaker in the Moravian-Silesian Region than in the whole Czech Republic. It could be caused by social and other factors. The rate of unemployment has a direct impact on the number if entrepreneurs doing as a main activity. An explanation could be the motivation by necessity.

It is obvious that the number of entrepreneurs with entrepreneurship as a main activity decreases with increasing amount of average wage in the Czech Republic and in the Moravian-Silesian region. This was the objective of some other researches, too, for example of Dvouletý and Mares (2016). An inversely related relation was defined between rate of unemployment and number of small entrepreneurs doing business as a main activity.

Looking for the causes of ties between unemployment, amount of an average wage or amount of payments, it is possible to focus on the area of financing small and middle entrepreneurs in following researches which is also a crucial area according to Sobeková Majková (2014). Also the aspect of innovations is important in connection with number of small main and secondary activity entrepreneurs as already Mura (2015) discussed.

Entering entrepreneurship is also influenced by a whole set of factors and incentives which are not of economic nature. According to Lukeš et al (2011), the role of the factors of psychological and social nature is crucial, too. The conclusions of the report GEM “Podnikatelská aktivita v ČR” (Lukeš and Jakl, 2011) are significant, too. They mention the role of motivation by opportunity and of necessity of entering the entrepreneurship when one of strong incentives to enter the entrepreneurship is long-term unemployment and impossibility to find employment on the labour market in any other way but through entering entrepreneurship.

## Conclusion

In the last years there could be observed a trend of decreasing the number of entrepreneurs doing business as a main activity and increasing the number of entrepreneurs doing business as a secondary activity.

The impact on the number of small entrepreneurs has certainly the whole entrepreneurial environment, like changes in legislation, introduction of new administrative measures from the side of public administration and other factors of external entrepreneurial environment, but also for example the simplification in founding a limited company as some self-employed persons ended their self-employment as and started business again through founding of a company. An analysis of these factors could be the next important step to gain an insight into changes of entrepreneurial environment and their impact on small entrepreneurs especially self-employed persons. The expansion of the research with searching for dependences of number of entrepreneurial subjects on other chosen factors would contribute to gaining further conclusions. These determinants have also been researched by Garcia (2014) and Kuckertz (2015).

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## TECHNOLOGY INNOVATIONS AS DRIVERS OF HOTEL ATTRACTIVENESS

**Tamara Floričić – Nadia Pavia**

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### **Abstract**

**Purpose:** In striving to achieve business excellence, hotel companies recognise the importance of new solutions that affect hotel attractiveness and boost demand. In order to implement adequate and optimised innovative concept they need to choose suitable innovations and to test their attractiveness. The aim and purpose of this paper is to explore tourist demand focused on youth tourism within the framework of experimental hospitality innovations. Why experimental hospitality innovations and how can they be organised and valorised within the tourism system? The possible answers emerge in attractiveness exploration and understanding the Millennials as new consumers segment that seeks new excitement, exploration and solutions.

**Design/methodology/approach:** The research includes quantitative as well as qualitative methods which explore the attitudes of tourist demand through 88 questionnaires conducted in January 2017 processed by statistical methodology including chi-squared test (February to May 2017). Methods of best practice research (February, March 2017) that are presented in framework of experimental technologies and creative thinking techniques are implemented and oriented towards creation of a new model that could impact demand of a specific market segment – youth tourists. The presented model of innovative solutions, created in March 2017) recognises categories of innovations that could impact perception of potential consumers about hospitality attractiveness.

**Findings:** Presented research suggests conclusions that would influence new knowledge and present the platform for innovative connections of industry stakeholders including hotel companies and technological innovations companies which could implement and test their innovative product and value it by actual consumers, hotel guests. Findings point to conclusions which confirm willingness of youngsters to stay in innovation test hotel, to evaluate and rank selected groups of innovations and to pay the market price for this special experience of being the part of product or service innovation process.

**Research/practical implications:** Paper proposes a new concept of development of hospitality structures that both innovatively organise hotel product and place it on tourism market, and support development and implementation of technological and organisational innovations as a new service that enriches hotel product. The concept provides the responses of tourist demand on sight in real time and that research results present indicative guidelines for further investments.

**Originality/value:** The contribution of this paper is reflected in a both a proposal of new approach and suggestion of innovations as marketing value for hotel companies when considering orientation towards demand as a selective market segment and as a mix of various innovative aspects that form hotel service: technology, organisation, service, experience, architecture and design.

**Keywords:** hospitality innovations, experimental innovation testing, hotel attractiveness, special experience, added value

**JEL Codes:** L83, L1, L2, M31

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## **Introduction**

A contemporary hotel product should correspond to the needs of modern travellers and tourists. It should influence creation of a new demand, driven by special experience and uniqueness. What does it take to make a choice and value innovative solutions as preferred service, how to recognise innovations that could generate new demand and new revenues and, would the guests stay and participate in an “innovation test hotel” where hospitality services, products and technologies would be tested in a certain period of time? These questions point to the aim and purpose of the paper which explores tourist demand and preferences of Millennials recognised as a key market of this special tourist product. The young consumers value design of new services and products created by hospitality related industries which impact hotel attractiveness at the tourist market

When considering the literature review and sources that were consulted during the research, it should be pointed out that many sources which analyse innovations were consulted but those that are dealing with innovation technology testing in the hospitality industry were not been found, which presents a limitation but also a platform for a scientific breakthrough with new knowledge and theories. Although technology test hotels already exist, there is a need for creation of a theoretical background which presents potential for further research. The problem presented in the research present the demand for innovation test hotels and their potential for competitiveness as a selective hospitality structure.

The insight which is provided by the conducted research includes the attitudes of tourists towards their decision to stay in innovation test hotels and their readiness to personally contribute to the evaluation of the implemented innovations. When considering the cost efficiency of the implemented innovations, the research recognises the importance of companies that develop innovative service technologies and the need for testing their benefits and added values to hotel businesses. The young consumers appreciate and search contemporary hospitality providers oriented toward technology, innovations and future.

## **1 Hotel industry and innovative solutions**

At the time of the fourth industry revolution the creation of added value in the tourism industry could be achieved by implementation of innovations. Innovative technology solutions solve problems, optimise business processes, impact competitive advantage and attractiveness in a tourism destination and, consequently, in the hospitality industry (Ivanovic et al., 2016).

Hospitality companies striving to create growth recognise the importance of products and services with new added value that could be achieved by transformation of potentials and expertise in institutional skills, by integrating the customer into the business processes, new patents, increased brand awareness and advanced information solutions (Chathoth et al, 2013; FitzPatrick et al., 2013).

Considering the innovation aspects and their implementation in hotel company organisation and business, five basic groups of innovative areas were identified, developed by hotels. These are: hotel services where innovativeness is reflected in the creation of a new product, imbued with conceptual changes, followed by innovative thematic interior design supported by art, heritage and creativity. Merging with innovative urban and architectural hospitality solutions presents a platform for new service development and creation of special experiences in the hotel offer. They make a distinction in hotel competitiveness and premium evaluation (Jurin, 2016) and market communication, supported by innovative technologies ranging from social networks to the creation of new distribution channels.

The technology is implemented through hotel business operational systems, information management systems, artificial intelligence and virtual reality. This assists attraction of new market structures and has a far-reaching effect on young consumers, in which it creates a long-term loyalty to a hotel brand. Technology enables efficient transformation of hotels into entertaining, interactive structures and social networks play a crucial role here. (Florivic, 2017)

Online reviews affect development of reputation management, directly pointing quality control in the hospitality business towards the required improvements in the quality of service performance and structure. Also, they indicate and point to new trends in development of tourist demand in the context of innovative solutions in the hospitality industry.

New products that are linked with the Internet (e.g. Internet of things) and digital solution services tend to be implemented in real time experimental hotels that would evaluate its value and impact on hotel attractiveness. The results, merged with operational advantages, form a decision about further implementation of innovative solutions in business and society. Joint initiatives are considered as co-operative tourism innovation projects and their focus should be primarily targeted on the development of innovative products, services and concepts to accelerate the tourism sector.

### **1.1 Special experience and hotel attractiveness**

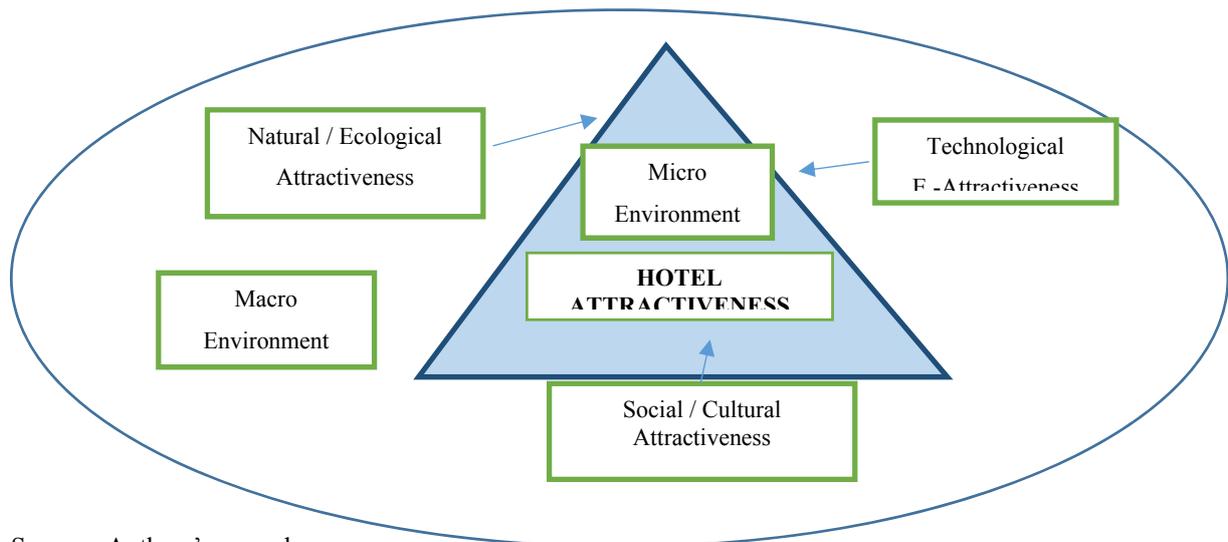
By affirmation of a hospitality business which experimentally implements and tests modern technologies, tourism of experience and themed tourism are developed which require

interesting and exciting themes and which can be staged and which are associated with authentic events, structures and environmental and technological experiences. For this, already built facilities are suitable, organised into experimental incubators, presented through the operational hotel accommodation and different services.

The main starting point of the model 4E, represented by Pine and Gilmore (2009), i.e. the model starting point is experience, i.e. experience which can be of different types and different degrees of intensity. The highest experience value will be achieved when all four dimensions are included: entertainment, excitement, education and aesthetic. The model can be used as a tool for creation of experience, but can also direct investment to new market niches. It represents tourists' behaviour, which, in its active variation, directly affects the experience in the hospitality system.

In consideration of the function of absorption and immersion, tourists absorb entertaining and educational events and "absorb" the hospitality environment which results in the experience of aesthetics, excitement and escape from their everyday life (Haeman et al., 2007). Cohen (2001) believes that tourist experience can be viewed as something having the structure of a spectrum - tourists decide their choice of destinations from nature-related tourism to cultural tourism, both being at opposite ends of the colourful continuum of tourism categories, with many other possible choices in between.

When considering tourist attractiveness, we can find many authors who comprehend tourist attractions and then consider tourism attractiveness. Murphy, Pritchard and Smith (2000), Gunn (1998), Lew (1987), Gartner (1996) have recognised tourist attractions as one of the most important determinants of tourist offer competitiveness. Tourist attraction can be defined as a characteristic of the tourism destination which motivates tourists to visit a particular tourism receiving area due to its specific features (Krešić 2007, 47) and furthermore, these can be added to this according to which the hotel itself in the tourism destination is affirmed as a tourist attraction through distinctive organisation, specialisation and thematization (Pavia, Floričić, 2016). They claim that, only by organising the product as a tourist attraction, by looking for new market niches and by profiling high quality specialised offers, can hotels build their competitive advantage. Activities associated with attractions are the elements within the destination's environment which, individually and combined, serve as the primary motivation for tourist visits (Salazar, Chang and Girard 2001,34).

**Fig. 1: Model of hotel attractiveness**


Source: Authors' research

Hotel guests' expectations have increased and hotel managements follow current trends and implement innovations and new technologies in order to be as competitive as possible. Hotels tend to specialise in a specific type of offer in order to attract a certain segment of service consumers. In addition, the authors recognise the third part of the triangle which forms a tourism attractiveness system emerging as a post-modern aspect of attractions' development; that is, technological attractiveness, as suggested in the model in figure 1. Accordingly, while examining the resource base, main tourism resources which represent the attraction basis and other direct and indirect tourism resources (Kušen, 2002), the necessity for inclusion of technological innovative exposure as a category of tourism resources is recognised.

Trends in youth tourism in recent years are of a kind that they are favourable for rapid growth and development. (Richard, Wilson, 2003:2,6). The classification of youth tourism travellers includes first of all students under 26 years of age, with a high level of education who, although having a low level of income, because they are still studying, demonstrate preparedness to work and save money on their journeys and before them, in order to increase their financial solvency and over half of them identify themselves as travellers, a third as "backpackers" and around a fifth of them, as tourists.

The Millennials, as leaders of a new generation of consumers, tend to choose hotels and destinations that develop and invest in technology exposed hospitality (Floricić, 2016). The subgroup of Millennials, Generation Z and iGeneration, as a generation of young to middle - aged travellers, are considered as a group whose demand will form the tourism of the future. Their generational common points include: self-confidence, orientation towards entrepreneurship, awareness of healthy life and they are prepared to listen to and implement

changes. When buying, they are guided by image and emotions, as well as by purchase of brands which reflect their expectations and their lifestyle and, in communication, they use multi-communication channels. When travelling, they rarely travel alone, they are team-oriented and big cause supporters, with great influence on others (Jurin, 2016).

The desire to meet new cultures represents the main motivation factor, followed by the factor of excitement and entertainment and knowledge improvement, which demonstrates the desire to get acquainted with other and new cultures and implementation of technological innovations. Young travellers are at the cutting edge of the use of new technology claims Ortega in the UNWTO report (2011). Richards (2007) and Daly (2013) study modern trends in youth tourism and implementation of digital technologies, just like Richards and Wilson (2003), who assert that youth travellers can often develop prototypes for the new tourist by setting trends and position services and products. After all, the UNWTO report (2016) represents the conclusion that Millennials of the iGeneration who come after them emerge at the time when they are aware only of the digital era. Even this has moved on to becoming a mobile adapted digital environment where information is now readily available, mostly free and very visual. Hotel companies should establish meaningful dialogue instead of one-way communication.

## **2 Research, results and discussion**

The research is divided into two parts. The first part of the research explores international best practices and innovative solutions that are implemented in the hospitality industry as pilot testing programs followed by evaluation by actual guests.

The second research involves questionnaire processed by statistical methodology methodology posed to Millennials – youth segment, potential travellers and explores their attitude towards technological and innovative attractiveness and willingness to stay and participate in a technology test hotel as a hospitality incubator. The research sample was chosen among youngsters as they are identified as consumers group that would have preferences towards technology in hotel industry, consequently would tend to choose technology test hotel as preferred hotel of their stay instead of traditional one. The super segmentation of sample was conducted and shown that different segment of youngsters tends to choose various types of accommodation facilities, and technological innovation could be implemented and tested in all these types. That points to a good representativeness as the chosen sample of young population is super segmented as student group and non-student group. After analysis, according to the similar results, the sample group is united, researched as unified segment and presented in

chapter 2.2. Conducted research and sample analysis lead to reliable findings that present a platform for possible generalisation.

As paper presents pioneering concept that investigates the relations of technologies, tourist motivation and special experience, statistical analysis is conducted in function of clarification and recognition of respondents' attitude. It suggests that the indicators that influence the new technologies' consumer behavioural model could be the subject of further research and hypothesis testing followed by robust statistical analysis.

## **2.1 Characteristics of international initiatives and practices**

Innovative solutions are developed in line with market trends, as a response to market demand. There are numerous examples of innovations in the hospitality business, but the real detachment is made up of authentic breakthroughs that change the perception and character of hospitality services. These innovations are often called experimental, pilot, technology testing, incubator, laboratory and beta modules. Aiming to get real time feedback from real consumers, hotels organise these types of hotels with implemented testing services where guests can physically evaluate new features and provide feedback in real time. Table 1 presents best practices in experimental hospitality technologies and feedback appreciation:

**Tab. 1: Experimental hospitality solutions and best practices**

<p><b>Technology test hotel</b> M - Beta at Charlotte Marriott City Centre</p>	<p>The first hotel innovation incubator where guests and visitors share their approval for a particular innovation by pushing a Beta Button. Real-time Beta Boards on digital screens throughout the hotel show the aggregated engagement scores, votes, and feedback on hotel innovations. M-Beta at Charlotte Marriott City Centre is currently testing a number of innovations, including hosted arrival, different hotel services, digital conference experience and many others. Featured hotel concepts rotate periodically as hotel ICT innovations are changing fast. The company implements in their hotels successful technologies positively evaluated by guests as innovative solutions and advantages.</p>
<p><b>Architecture and design experimental concept</b> Pop-up Hotel Koti</p>	<p>Visitors to the Koti hotel in Paris will be immersed in a Finnish experience supported by Finnish design, gastronomy and sleeping in wooden cabins made in Finland, fully equipped with products of Finnish designers and sharing meals around a communal table. The hotel promotes the concept as a "common, shared home". As a temporary project, the hotel presents a cultural experience followed by evaluation.</p>
<p><b>ICT – WiFi technology</b> Experimental testing in the hotel industry</p>	<p>JAKCOM serial smart nail is an entirely new multifunctional nail art product focused on the perfect combination of technology and fashion. The N2M is a smart nail, built into a microchip that is made by nano technology. It can copy and simulate to become any inductive IC card. The hospitality industry can use it as an access control card (hotel key), elevator card, time card, membership card.</p>
<p><b>Innovative urban architectural hospitality solutions</b> The Cloud Keys Switzerland</p>	<p>The hotel innovates an experimental business concept: Converting your “Zero Stars” into a 5-star experience where lodging facilities enable guests to sleep on a Swiss mountainside without walls around them and without ceiling. The room concept is equipped with a bed with two bedside tables, a reading lamp and views to the Graubünden mountains. The "Zero Stars" name describes this venture and redefines the minimal hospitality experience into those of five stars and the mantra of their very special lodge is "the only star is you". Personalised monograms sewn onto a bathrobe, a goodnight “kiss” experience basket, a tailored message with selected information of guest’s interest are designed as a 5* service.</p>
<p><b>ICT Technology in hospitality outdoor area</b> Steora smart bench</p>	<p>Steora is a smart bench equipped with an independently developed wireless device charger and two smart USB connectors, providing fast charging for mobile devices with internet access constantly available. It operates independently on solar power, and it is equipped with built in sensors which gather different sorts of information including atmospheric conditions, number of users and component functionality. This experimental technology is tested in a Croatian tourism destination within the vicinity of tourism attractions and hotels.</p>

Source: Authors’ research

Marriott is an innovation leader, ranked 19<sup>th</sup> on Fortune’s list of Most Innovative Companies, and the powerhouse in hospitality innovation. As presented in table 1, Marriott hotel brand invited the public to help transform the traditional hotel experience by staying in

hotel M Beta. The chosen innovative solutions are implemented in business operations of Aloft hotels, company's innovation incubator brand and eco-conscious extended-stay brand Element hotels that operate under Marriott brand flagship. At year-end 2016, there were 116 Aloft and 23 Element hotels open around the world, with 150 Aloft and 73 Element hotels in the pipeline globally<sup>17</sup>.

## **2.2 Technology test hotel – concept and potentials**

The research is conducted by a questionnaire which included questions related to the implementation and knowledge about modern technologies and ranking the typology of innovative solutions as well as their impact on hotel attractiveness. The research explores the efficiency of e-marketing that is also oriented towards youth travellers and hospitality consumers.

The research was carried out using a survey questionnaire, conducted in February and March 2017 at the University and local community of the town of Pula. Total number of participants was 110 persons; 88 of them replied, which represents a response percentage of 80%. Analysis of the gender structure showed that 25% of the participants were males and 75% were female. The age structure of the youth segment shows that 5% of replies belonged to iGeneration (up to 20 years of age), 86% of participants were Millennials and Z Generation (from 20 – 25 years of age) and 9% Millennials (older than 25 years of age). Aiming for a deeper insight into knowledge and awareness of young people about hospitality technologies and innovative solutions, questions which rank importance and awareness were posed.

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<sup>17</sup>Marriott International. *Official release.*, [ONLINE] Available at: <http://news.marriott.com/2017/01/marriotts-first-ever-pop-innovation-lab-evolves-cutting-edge-aloft-element-hotel-brands/>, [accessed on 02 March17]

**Tab. 2: Awareness of hospitality innovative solutions and competitiveness potential**

Technology Description	N = 88 Respondents who recognise technologies %	Rank according to knowledge and familiarity	N = 37 (42%) Respondents Micro sample Number of points	Rank according to competitiveness potential
Technologies related to energy management (water, electricity, waste )	58.0	3	96	1
Technologies related to innovative design and arrangement	28.2	2	114	2
Technologies related to e-marketing in hospitality business	43.2	4	141	3
Technologies related to business process informatisation in hotels (e-key, e-butler, e-check in)	65.9	1	163	5
Technologies related to virtual intelligence (humanoid robots)	6.8	8	220	7
Technologies related to virtual reality (PokeStop hotels)	6.8	7	268	8
Innovative physical and architectural organisation (dislocated hotels, capsule hotels)	25.0	6	177	6
Innovative theming as a special experience (movie hotels, jazz hotels, wine hotels... )	42.0	5	152	4

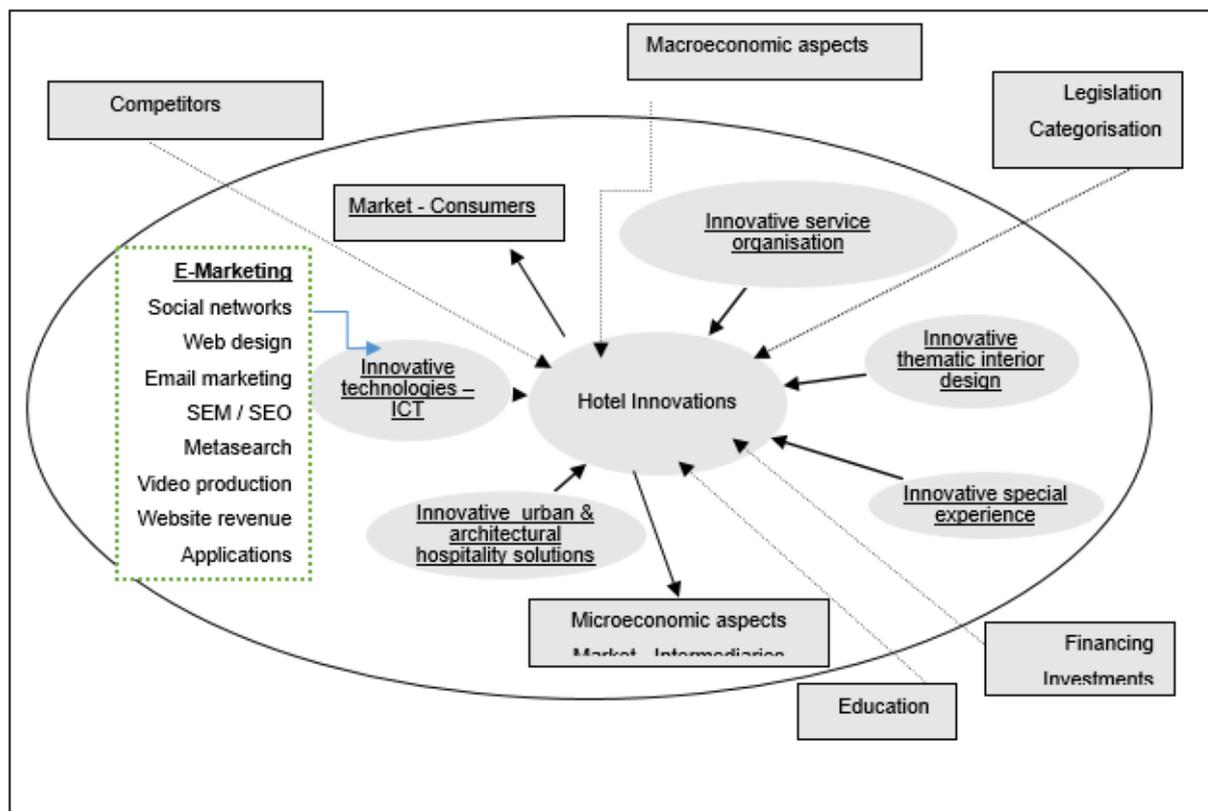
Source: Authors' research

The answers point to the fact that young people recognise the potential of innovative technologies, primarily those related to business process informatisation, innovative design and arrangement, which occupy first and second places on the rank scale. Of third importance are technologies related to energy management and fourth, related to e-marketing in the hospitality business. The importance of innovative theming in the hospitality business has been recognised as a special experience, which is put in fifth place, followed by innovativeness in architecture and physical organisation. Technologies related to virtual intelligence and virtual reality occupy seventh and eighth places. This points to the educational potential, considering that the listed technologies are more rarely implemented than the previously listed ones.

The illustration of attitudes of a smaller population sample within the group follows. Namely, given a high number of invalidly completed questionnaires focused on the question of attitude research related to the effects of innovative technologies on hotel competitiveness and in accordance to their relevance, a micro sample was created, by which the said attitudes were presented. The micro sample encompasses persons who graded each presented option; possible exemption of any of the listed questions would affect the formation of cognisance and therefore

it was not done. In processing, the number of points which represent the sum in the final product was added to the selected rank position, constituting the basis of the final ranking in which young people recognise the attractiveness of technologies which contribute to the hotel competitiveness according to the following rank: (1) technologies related to energy management, (2) technologies related to innovative design and arrangement, (3) technologies related to e-marketing in the hospitality business, (4) innovative theming as a special experience (5) technologies related to business process informatisation in hotels, (6) innovative physical and architectural organisation (7) technologies related to virtual intelligence, (8) technologies related to virtual reality. The two last listed technologies, occupying 7th and 8th ranks should, theoretically, more strongly affect the attractiveness, but the research did not prove this hypothesis. The possible reason for this lies in a flawed perception and knowledge as to what exactly the listed technologies include and what are the scopes of their applications to the real hospitality business and marketing. The quoted data includes young people's opinions about the potential of the contribution of hotel competitiveness technologies and innovations in relation to traditional hotel offers.

**Fig. 2: Model of innovative solutions in hospitality industry**



Source: Authors' research- developed model after Impact of tourist demand on implementation of innovative solutions, (Author's contribution, according to: Floricic, T, (2016)

In accordance with the presented model and the rank from the table, the importance is recognised of further development and valorisation of technologies with considerable attention to ICT technologies and e-marketing and assessed level of a specific technology in the sense of personal preferences and its consumption.

Assessment of the importance of modern technologies and innovations in the satisfaction of staying in specialised hotels showed that, for 26% of respondents, technologies and innovations are not important, 65% answered that they are important, while 9% assessed them as very important. Conclusively, it is presented that 74% of respondents consider technologies and innovations in the hospitality business to be an important category, which indicates that they should be developed adequately, tested and systematically implemented in hotel offers

The chi-squared test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in categories of market potentials of innovation test hotels.

$$X^2 = \sum_{i=1}^r \sum_{j=1}^c \frac{(O_{i,j} - E_{i,j})^2}{E_{i,j}}$$

The chi-squared test formula: was used and the frequencies were calculated for following frequencies, with significance 1,0, described with research questions:

1. Would you like to stay in hotel that implements and test innovative solutions?

**Table 3: Preference of stay in innovation test hotel**

	Would like to stay in innovation test hotels	Wouldn't like to stay in innovation test hotel	<i>Marginal Row Totals</i>
<b>Obtained frequency</b>	89	11	100
<b>Expected frequency</b>	90	10	100
<b><i>Marginal Column Totals</i></b>	179	21	200 (Grand Total)
Chi-squared test: 0,111		p-value: 0.73888268	

Source: Authors' research

2. Are you willing to pay more for stay in technology test hotel instead of classic one?

**Table 4: Financial compensation attitudes**

	Willing to pay more for "innovation experience" hotel	Not willing to pay more for "innovation experience" hotel	<i>Marginal Row Totals</i>
<b>Obtained frequency</b>	43	57	100
<b>Expected frequency</b>	80	20	100
<b>Marginal Column Totals</b>	123	77	200 (Grand Total)
Chi-squared test: 85.563		p-value: 0	

Source: Authors' research

3. Have you heard about technology test hotels and do you know any?

**Table 5: Knowledge about technology test hotels concept**

	Previous knowledge about technology test hotels	No previous knowledge about technology test hotels	<i>Marginal Row Totals</i>
<b>Obtained frequency</b>	2	98	100
<b>Expected frequency</b>	20	80	100
<b>Marginal Column Totals</b>	22	178	200 (Grand Total)
Chi-squared test: 20,25		p-value: 0.0000068	

Source: Authors' research

Examining questions related to preferences in choosing a hotel and researched with chi-squared test suggest, the attractiveness of innovative solutions and e-technologies, as well as preparedness to test them in the hotel itself, 89% of respondents confirmed that innovations contribute to their decisions about which hotel to choose, while 11% of them do not valorise them. The obtained frequency is in correspondence with expected one. In price definition of such a hotel product, 43% of respondents stated that they were prepared to pay a higher price for stays in specialised technology test hotels, while 57% responded negatively. The obtained frequency in relation with expected one varies of 37 points which present the highest misbalance that could impact financial plans and return on investment issues. Although, in recognition of some of the world experimental hotels, young people declared that they were not familiar with them (98%) which present the significant difference of 18 points between obtained and researched results.

In relation with the quoted 89% who would gladly stay in such hotels points to the potentials of organising technology test hotels as hospitality products by which the attractiveness of the accommodation offer itself, destinations, companies which implement innovations and young population who develop awareness about innovations and technological advancements, could be influenced. A need is recognised for the conduct of future research in

which the accent should be put on the e-marketing instruments, by means of which modern consumers and specialised service consumers could be reached.

## **Conclusion**

Information technology and its implementation is increasingly becoming an important element in achieving competitiveness and efficient performance of modern companies (Müller, 2001, 587). Hotels conduct their business in a dynamical environment whose main properties are strong competitiveness, globalisation and technological innovations. Respecting the needs and wishes of increasingly modern users of their offer, hotel management should consider implementation of changes, not only in hotel operations, but also in shaping of their offer. By implementation of innovations in hotel offers, application of information and communication technologies, experience could be richer for the consumer.

The data presented in this paper demonstrate young people's opinions about the potentials of the contribution of modern technologies and innovations of hotel competitiveness in relation to traditional hotel offers. In accordance with the presented model and the rank from the table, the importance is recognised of further development and valorisation of technologies and the assessed level of a specific technology in the sense of personal preferences and its consumption.

The following recommendations could be proposed:

- As the key segment, young people should be better educated when it comes to modern technologies and their importance in the tourism and hospitality industries as a part of the economy of society. Efforts should be invested from different sides into deepening of knowledge and possible development of educational systems at all levels, through which young people would learn about technological development and applications in all spheres of the economy.
- Hotel promotions should be directed towards the affirmation of special experiences by means of modern technologies and their further promotion through e-marketing tools.
- Technology test hotels and companies and technology providers should present themselves together in the market and promote implemented technologies as a valuable investment.
- New innovations, as a part of "smart" projects and "start-up" SME companies and initiatives, often do not have marketing expansion financial assistance. With synergic presentations and project applications for incentive developmental funds,

the potential is presented of financial alleviation of innovative experimental technology implementation and marketing.

- The companies could consider implementation in their hotels successful technologies positively evaluated by guests as innovative solutions and advantages and production companies could proceed with further sales.

By examining the method of deepening of knowledge and information about technologies which improve hotel business, a need is evident for the conduct of future research supported by robust statistic analysis. The accent of future research could be put on the potentials of e-marketing instruments. They could be used to reach modern users and consumers of specialised services, they represent special characteristics and benefits which ennoble the basic hotel offer with special facilities and cognitive experiences in order for them to, by personal participation, create the hospitality business of the future.

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## NEW APPROACHES TO OPTIMIZATION OF LOGISTIC PROCESSES

Ivo Formánek – Radim Farana

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### Abstract

The paper aims to inform about practical experiences of our team with logistic processes optimization. The optimization is done both by application of contemporary ICT technologies and by advanced technologies working with artificial intelligence - especially with fuzzy logic and expert systems. The methodology begins with thorough data and process analysis, continues with data mining and ends with new processes definition, measurement and visualization. An important requirement is also the economic sustainability of the proposed solutions. Special emphasis in the paper is laid on distribution storages processes working with very limited working space for goods storing.

**Purpose:** The purpose of this paper is to inform about the results of applied research in industrial enterprises.

**Design/methodology/approach:** Our research concentrates on application of advanced ICT technologies that make good use of mobile technologies and technologies working with artificial intelligence - especially with fuzzy logic and expert systems. The methodology begins with thorough analysis, continues with data optimization and ends with right process definition, measurement and visualization.

**Findings:** We analysed a couple of industrial organizations having troubles with regular, effective and efficient logistic processes. We found out that the logistic processes in many organizations are not defined enough and in case of unexpected situations (e.g. production breakdowns, missing trucks or too early, resp. too late trucks arrivals etc.) the logistics control is based only on operators' experience, simple delivery data identification and mobile phones. Our solution leads to economy information support being able to react also to unusual events.

**Research/practical implications:** Based on our experience we can say that the only consistent optimization and consistent automation of all processes can lead to optimal management of logistic processes in organizations. The great hope for the future is the concept of Industry 4.0, which allows very thorough but not too expensive supervision of all activities that can affect management of processes in organizations.

**Originality/value:** The research is carried out in the current industrial organizations. The organizations are looking for solutions that enable effective, efficient and long term sustainable complex solutions supporting logistic processes. The requirement for economy of the processes is also very important.

**Keywords:** process control; process analysis; process synthesis; material flow; control system

**JEL Codes:** C53, L23, L61

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## **Introduction**

In many organizations, logistic processes represent up to 80% of all operations (Murphy et al., 2015; Wallace et al., 2015). So when we talk about the optimal strategic management of the organizations we must talk also about optimization of all kinds of logistic operations. But this type of optimization is not easy due to complexity of logistic processes. When optimizing the logistic processes; we must face two main problems:

- difficult availability of the necessary data and
- the synthesis of logistic processes of different character.

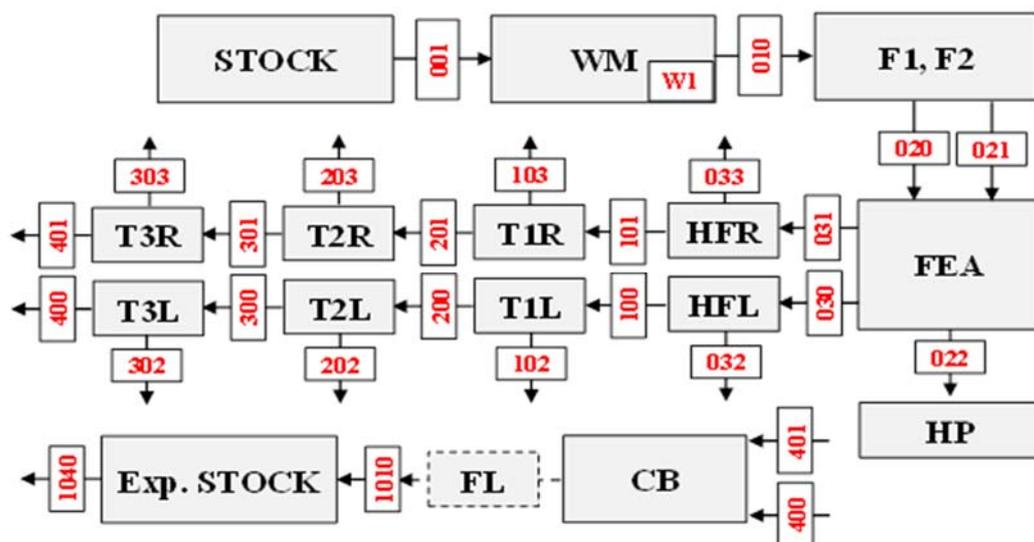
Availability of the necessary data is difficult because many information systems were built up gradually, step-by-step. Due to this fact it is usual that the data can be found in different and quite isolated databases (DB). To make all the matters even more complex, the operation and maintenance of these DBs are often in charge of various companies and different people. For this reason, the data acquisition and data processing in practical applications is usually quite difficult task for data mining (Wang, 2015).

Logistic processes are also of a very different character and we must apply different strategies to control them optimally. For instance, part of these processes can be controlled by automatic control systems (with no human control) and part of them by automated control systems (with a human control). While there are plenty of recommendations for design, synthesis and optimization of automatic control systems, in case of automated control systems the situation is exactly the opposite. Unlike the machine-precision control processes, the human control processes are more or less influenced by the human creativity and many unexpected control interventions. As an example of such processes we could include the processes of production and distribution logistics in the rolling mills. The production logistics (information and material flow at production lines) is controlled by automatic control systems, the distribution logistics (information and material flow between distribution storages and customers) by automated control systems. If there is a sufficiently large material buffer between the processes of the production and distribution logistics, the addressing of mutual interaction is quite easy (Murphy et al., 2015). Processes of production and distribution logistics can in such a case work on independently. But if there are not large enough material buffers between the processes, the solution is much more complex. The reason for this is that we carry out the synthesis of processes of completely different character. At the same time, we have to ensure the maximum safety of the operators and achieve maximum smooth material flow at minimum transport costs. In the article, we present our long-term experience we have gained in synthesis of such processes.

## 1 Methodology

Based on the experience, we can say that in practical applications the process of suitable data collection and data processing is one of the most difficult and time-consuming processes when optimising logistics operations. This process also requires application of different methods and different ways of solutions. For this reason, it is difficult to bring unique and generally valid instructions for appropriate research and working methodology. But with a degree of simplification, we can specify several basic steps that should not be missing in any projects for logistics: formulation of problems and understanding the problem and the context; data selection; data pre-processing and data transformation; data mining; data interpretation; application of exploratory statistics methods; application of correlation analysis methods; application of regression analysis methods; analysis of time series; data interpretation. On the basis of the methodology currently available, it seems fair to suggest that two Parallel PDCA Cycles (i.e. Plan–Do–Check–Action cycle for people accountable for the issue; and Problem finding–Display–Clear–Acknowledge cycle for people responsible for the issue) and one SDCA cycle (i.e. Standardize–Do–Check–Action cycle). Applying with two Parallel PDCA Cycles provide confirmatory evidence that we integrate into the process of solving all the elements of planning, implementation, evaluation of results and further talks, which adapts to the conclusions from the evaluation of the results achieved. SDCA cycle then the results achieved standardize and stabilize (Liker, 2004).

**Fig. 1: Processes of production logistics**



STOCK – billets storage; WM – weighing machine of billets; W1 – weight of a billet; F1 & F2 – main heating furnace 1 & 2; FEA – furnace extracting area; HP – hot pocket; HFR/HFL – heating furnace right/left; T1R/T1L

– train 1 right/left side; T2R/T2L – train 2 right/left side; T3R/T3L – train 3 right/left side; CB – cooling bed; FL – finishing lines; Exp. STOCK – distribution storage; 001 to 1140 – material detection)

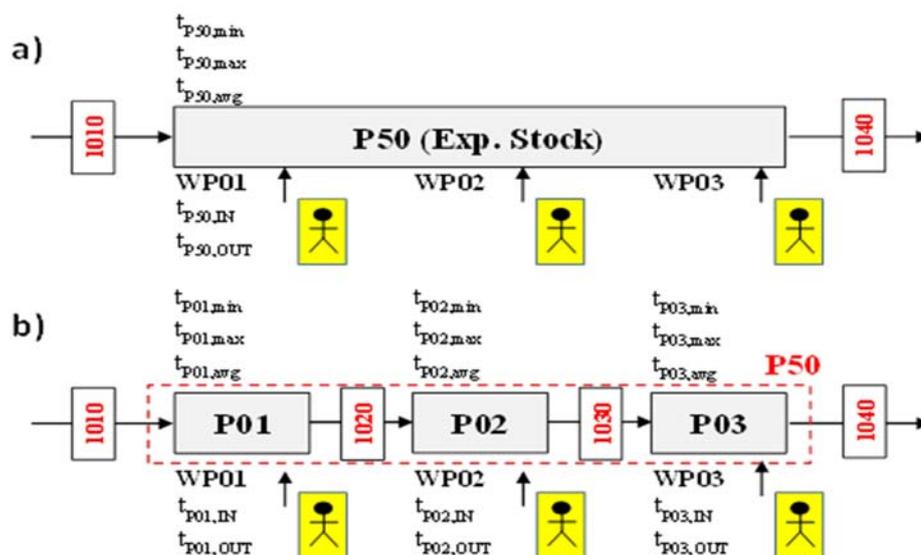
Source: authors, own processing

Based on our experience we can say that in all the above steps is very beneficial the presence and cooperation of business and operation specialists on the issue. If the specialists are missing, the proper interpretation of many data is very difficult. In many cases, it is also appropriate to apply advanced methods of management, for example expert systems. This problem is also briefly mentioned in the paper. Within the logistics processes then we are focusing primarily on the processes of production and distribution logistics.

## 2 Production logistic processes

The main task of the production logistics is to ensure of material flow and the material flow monitoring in the processes of production. The tasks with automatic control always outweigh in these processes. These tasks are parts of the tasks of the management systems of production machines and production lines. Typical representatives of these control systems on rolling mills include (Formánek et al., 2014; Formánek et al., 2015): standard and application systems to drives control (electric, hydraulic, pneumatic); machinery control systems; control systems for production groups and production lines; manufacturing operations management systems.

Fig. 2: Processes of distribution logistics



(Exp. STOCK – distribution storage; P50 – distribution storage process; WP – workplace; P01, P02, P03 – distribution storage sub-processes;  $t_{IN}$  – time of material input into the process;  $t_{OUT}$  – time of material output from

the process;  $t_{\min}$  – minimum passing time of the process;  $t_{\max}$  – maximum passing time of the process;  $t_{\text{avg}}$  – average passing time of the process; 1010 to 1140 – material detection)

Source: authors, own processing

At the level of monitoring for production material flow supervision it is then convenient to model the production as a system of buffers (production areas), in which the material enters on one side and on the other side gets out. An example of such a model is a model in the Fig. 1. The production logistic processes usually end up by storing the material in the distribution storages at the rolling mills.

### **3 Distribution logistic processes**

The main task of distribution logistics in rolling mill processes is to ensure and monitor the material flow from the distribution storages until delivery of the material to the customer. As carriers of material here are mostly used various types of cranes in distribution storages and then almost exclusively trucks and railway cars. In these processes, there are predominating the tasks with automated management i.e. with the proceedings where a part of which are the operators and their control interventions. As regards the management systems, there are usually a variety of applications within the framework of MES systems. These systems communicate with the ERP systems and with the industrial automation systems. The problem of older MES applications is often in the fact that it is an isolated application oriented only on solutions limited of task oriented applications. They are also not always the data needed for the distribution logistics process control available in one place, in one DB. Sometimes this data is missing completely, otherwise they are "scattered" after different DBs in different ICT systems. As an example, here is Fig. 2a. To model the processes of distribution logistics in Fig. 2 is used the same principle as in Fig. 1. As already mentioned in the introduction, a bottleneck of distribution logistics at older rolling mills are the distribution storages.

#### **3.1 Distribution storages issue**

The main problem of distribution storages of older rolling mills is the fact that their layout and infrastructure are not adapted to the needs of haulage. Nowadays, however, transport by trucks is prevailing. This fact greatly complicates the situation not only in the planning of production, but also in the loading the material on the trucks. Truck transport requires completely different conditions than rail transport to that prevailing in the past. For example, in the case of truck, there can be loaded material weighing up to 25 tons on one truck. This cargo truck can ideally

represent only one shipment delivery (i.e. the products for one customer). More often, however, the cargo truck represents more supply deliveries (i.e. products for more customers). This occurs mainly when customers are interested in the supply of small mass (e.g. 2.5 tonnes, 5 tonnes, 7 tons, etc.). In this case, the supply of small weight is put together into groups of deliveries in such a way as to achieve the upper limit of the weight of the cargo truck 25 tonnes. This is because the quest for the maximum use of the capacity of the truck. Each delivery can then be further divided into items (e.g. 1-10) that represent the different types of material in the shipment delivery.

In this context, it is worthwhile to consider that the distribution by trucks requires significantly better organization of the work of the distribution teams in distribution storages than it did in the case of railway transport. Railway transport was allowed to produce, store, dispose of, and transport the relatively large quantity of the same product. Truck transport and requirements of today's customers, in contrast, require the production, storage, handling and distribution in a relatively small number of very diverse products. And this has an impact on the complicated situation in distribution storages.

### **3.2 Solutions with expert systems**

When you design a solution to the situation in distribution storages, you can do this in different ways. One possible solution is to deploy expert systems (Farana et al., 2016; Walek, 2015), which allow the material to be stored in warehouses in such a way that, for example there is no loss of time due to the need for translating material from place to place. In order to the expert systems could be effectively deployed for warehouses, the following prerequisites should be primarily met:

- the availability of expert knowledge to build knowledge base;
- the availability of data on the movement of goods for the assembly of data base;
- the deployment of expert system and continuous assessment of the correctness of its outputs.

Deployment of expert systems to support the distribution storages is completely inappropriate in the moments when:

- it is not possible to identify the parameters that affect the inputs and outputs of the storage;
- it is not possible to describe the dependencies between the inputs to and outputs from the storage;

- the influence of each parameter on the behaviour of the system is changing rapidly, so the influence of obsolete rules occur large errors in prediction.

For the possible deployment of expert systems can be recommended for example fuzzy-expert system (Farana et al., 2016; Walek, 2015; Xu Bin, 2010; Zhang, 2004), which allows the experts to describe their knowledge very easily the current language by using linguistic expressions (Novak, 1995; Pokorny, 1996). Current research appears validate the view that as an effective tool we use Linguistic Fuzzy Logic Controller (Novak, 1995). Linguistic Fuzzy Logic Controller allow to an expert the very easy to describe his knowledge by using the vague information, if its only superficial knowledge, the expert can use the fuzzy value of zero – small – medium – big. If his knowledge about the impact of the parameter may be used to more precisely defined detail fuzzy values as it is extremely small, roughly small etc. The set of these values was drawn up on the basis of the analysis of a large number of applications, and with regard to the abilities of the experts.

Further research in this area may include, when the practical applications of expert systems in distribution storages of the rolling mills is the availability of the necessary expertise and data problematic, it can be recommended to deploy expert systems only when some simpler methods of material flow optimization fail.

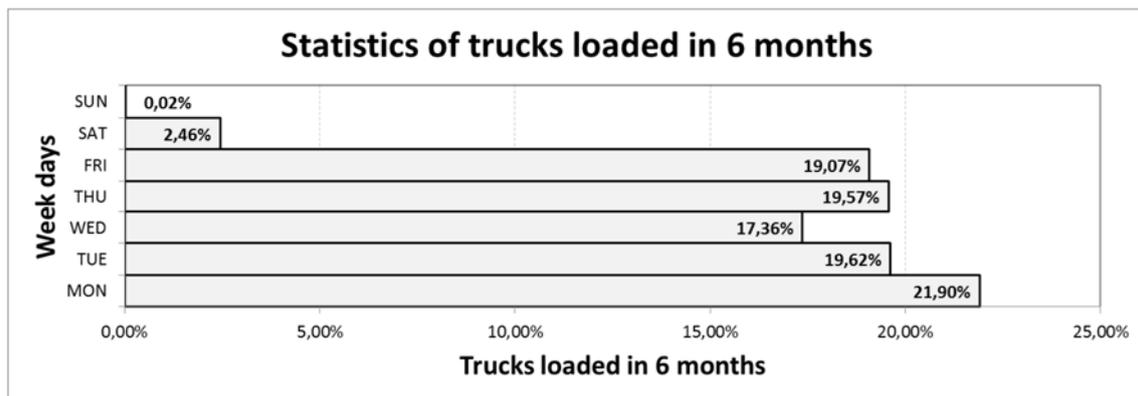
### **3.3 Optimization of truck transportation**

The consensus view seems to be that the trucks are now the main material carriers within the distribution logistics. Thus the truck transport should therefore be one of the important topics in optimising logistics. The problem of truck transport is the fact that a big role is played by the human factor – i.e. the truck drivers and operators in distribution storages. No less important is the role and the current traffic situation including the effects of the weather. Also the lack of sufficiently large parking areas (i.e. truck buffer) in and around distribution storages can play an important role. For this reason, it occurs very frequently to irregular shunting of trucks within the required times and thus traffic jams in front of distribution storages. Additional context can be seen from the examples in the Fig. 3 and Fig. 4. Fig. 3 and Fig. 4 represent the results of long-term measurements that we conducted at distribution storages in two rolling mills within the applied research.

Fig. 3 shows that customers and carriers long-time prefer to load the trucks on Mondays. Wednesday is the least used working day. This phenomenon is caused partly by the fact that in the present case, trucks arriving for material up to the prior discharge of material in other companies. Usually this landing takes place at around six o'clock in the morning.

In Fig. 4 are also discernible common fluctuations over a 24-hour cycle. Fixed working hours has the beginnings of shifts in the 8 hours-presence of employees established in the workplace at 06:00, 14:00 and 22:00 o'clock. Fig. 4 presents, it is obvious that the beginning and end of shifts is significantly reflected in the disturbance of the distribution. Therefore, a better organisation of work in distribution storages can considerably improve the fluidity of distribution material by trucks.

**Fig. 3: Number of trucks loaded in 6 months – detail of week days**

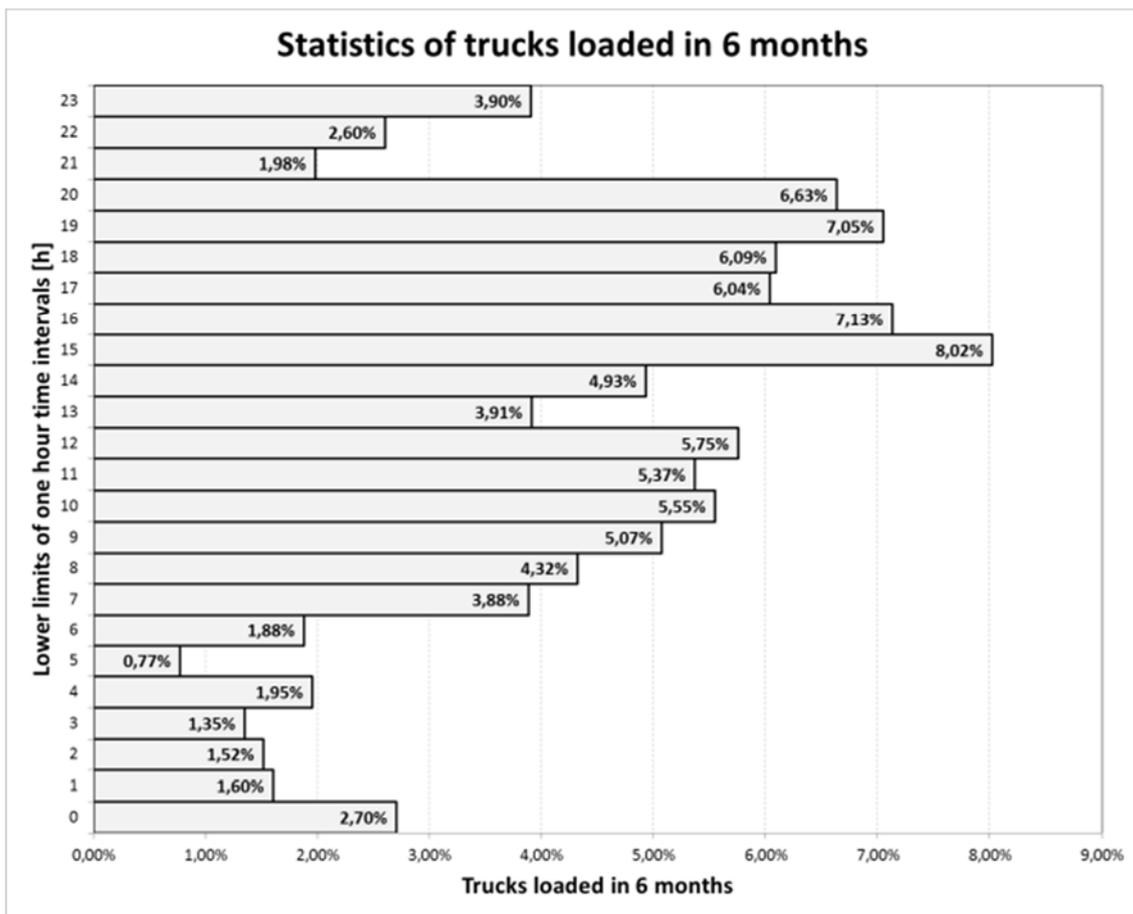


Source: authors, own processing

As interesting, there is also the view of the compliance with time windows by trucks. For example, in the monitoring period of the truck transportation (Fig. 3 and Fig. 4) was the status of compliance with time windows, which was allocated to carriers, as follows:

- 49% of trucks were on time, i.e. in assigned time window;
- 19% of trucks were too late, i.e., i.e. out of assigned time window;
- 32% of trucks were too early, i.e. out of assigned time window.

**Fig. 4: Number of trucks loaded in 6 months – detail of working time and time windows**



Source: authors, own processing

Fig. 3 and Fig. 4 shows that the increased variability of distribution logistic processes involved in truck transport to a significant degree. This fact causes problems not only in distribution storages, but also on the access road to distribution storages, including gates. To improve the situation in distribution storages of the rolling mills, it is therefore important to pay attention to the optimal management of truck transport, which is also used by GPS systems and RFID.

#### 4 Recommendation

Measures to optimize the processes of distribution logistics we use are in technical practice long-proven. On the basis of experience, it can be stated a number of principles, which is necessary when a successful analysis and synthesis of logistic processes to follow.

- by using the information and material flow mapping to create a value stream map (Wallace, 2015);

- when parsing a consistently break all processes into the components whose performance can be effectively measured; decomposition processes is evident from the example in Fig. 2;
- to define the structures between components processes, especially their functions and parameters;
- the structures between components to distinguish whether it is their influence on the problem malicious or useful, whether the structure features are oversized or undersized, how close are the structures to tackled the problem etc.;
- the interaction between the processes to deal with especially simple methods and measures that are acceptable in the long term in practice;
- complex solution methods apply to when the simple methods really do not lead to a satisfactory solution; technical practice of complex solutions don't like to accept;
- the centre of the work put on the analysis of the problems; the deeper and more consistent the analysis will be, the more sophisticated the synthesis; when applied research we often pay 90% of the time to the study of the analysis of the problem and only 10% of the time their own solution;
- for the synthesis of processes with operators only need to lay down rules that operators should keep; compliance with the rules by using ICT systems to measure, visualize and, if necessary, to escalate

## **Conclusion**

This paper presents some of our experience we have gained in two big projects of optimization of processes of production and distribution logistics at rolling mills. In the context of the optimization was considered various solutions. As the most important and most successful was eventually showed a solution which was based on strict measurement of all activities in the processes and monitoring – monitoring the compliance with the rules, which were established for the process. The know-how that we gained will be extremely important especially when the organizations begin to implement elements with the technology Industry 4.0. Distribution logistic processes will be more measurable and better controllable. In the case of logistic processes, the introduction of technology Industry 4.0 is so great promise for the future. As a part of our solutions we realised in the projects, there was also the design and partial implementation of information system for processing and visualization of operational data, which are necessary for the effective and efficient management of logistic processes. The information system is not presented in the paper.

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## **SUPPORTING SUSTAINABILITY AND INNOVATION BY VALUE-ORIENTED LEADERSHIP**

**Patricia I. T. F. Girrba**

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### **Abstract**

**Purpose:** Innovation in terms of sustainability requires appropriate leadership, values and circumstances. Although the concept of sustainability is well known nevertheless indeed there is a great discrepancy between theory and practice. Therefore, the aim of this paper is offering an appropriate leadership concept named Silent Leadership (SL) in order to reduce this discrepancy and to support innovation in sustainability-oriented companies.

**Design/methodology/approach:** The paper is based on a current study conducted by the Wertekommission 2016. The study is based on interviews with 674 German executives of the middle and higher management. On the basis of this data a contemporary leadership concept is developed which takes the results of the research into consideration.

**Findings:** The research covers an important topic of appropriate leadership style, which could lead towards more successful sustainability innovations in companies by closing the discrepancy existing in companies in terms of desirable and actual values.

**Research/practical implications:** The paper includes implications for a new kind of leadership named silent leadership which serves as an appropriate concept for managing the challenges in terms of sustainability and innovation processes caused in a rapidly changing world.

**Originality/value:** This paper fulfils an identified need to reduce the actual discrepancy between desirable and actual corporate values in order to support sustainability as well as innovation in companies.

**Keywords:** Sustainability, Innovation, Silent Leadership, Value-oriented Leadership

**JEL Codes:** O30, O31, O32

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## **Introduction**

Change is the only constant. Indeed, political and social occurrences like terror attacks, popular elections against the success model Europe of the past months demonstrate that companies are faced with extremely changing circumstances. Consequently, the demands on companies increase. Moreover, companies are faced with the challenge to fulfill requirements of their stakeholders like shareholders, suppliers, employees or customers especially concerning social and environmental aspects. In order to fulfill these requirements and to face the challenges in a rapidly changing world, companies have to be both, sustainability-oriented and innovative.

### **1 Sustainability and Innovation**

The concept of sustainability takes into consideration social, environmental and economic aspects and focuses on several stakeholders such as customers, suppliers or employees. Sustainability as a company vision requires appropriate values in order to set guidelines in terms of desired behavior within the company. In this context, the concept of sustainability focuses especially on responsibility that can be concretized as the obligation to advocate for environmental, economic and social aspects and to bear the consequences of business activities with regard to suppliers, customers and employees. As a result, HR-orientation is another crucial value for sustainability due to the fact that social responsibility affects first of all the own employees. Responsibility requires trust. Trust in relation to the suppliers, the managers and employees who should act accordingly to existing formal and informal values even without direct control but due to existing agreements concerning proclaimed core values. In this context trust can be concretized as behavior that gives the opposite security. It includes subjective conviction of the correctness or truth of actions. Furthermore, trust can be described the ability to allow others scope (Wertekommission, 2016). Trust fosters sustainability-oriented and innovative behavior caused in the resulting following mechanisms:

- Trust increases motivation of staff by supporting their identification with the company and respective values as basis for any engagement and resulting innovative ideas.
- Trust promotes cooperation because it fosters participation processes, improves the problem-solving capacity of the cooperating stakeholders and increases the willingness to cooperate between internal and external stakeholders what is crucial for finding innovative ideas in terms of environmental, social or economic aspects.

- Trust optimizes communication processes: Trust strengthens the willingness of employees, customers or suppliers to accept information from others and to pass it on to other players what is really important for creating innovations.

In order to support sustainability seeking for innovation should be a further value. As products and services are equal in terms of price and quality, companies can differentiate themselves and their products positively from competitors by acting accordingly to sustainability and by creating innovative social and environmental friendly products. In this context, sustainable products can offer customers a value added in terms of the product (bioproducts, durable consumer goods), the production process (e.g. cosmetic products without animal experiments, electricity from regenerative energy sources), the consumption phase (energy saving lamps) or the post consumer phase (e.g. recyclable consumer goods).

## **2 Newest Insights**

An external current value study figured out the most important values in the context of management and leadership (Wertekommission, 2016). Hereby individual and desirable and actual company values were concretized. The survey was carried out online supported by a certified online access panel provider for data generation. A total of 674 executives from the German economy were interviewed. The majority of the respondents came from the upper and middle managers, only about 20% were managers of the next generation. Regarding the perception and assessment of company values, a long operating affinity is advantageous. About 40% of respondents were between three and ten years in the company whereas the majority (53%) has been working in the respective company even for more than ten years.

Concerning individual core values the research found out that responsibility and trust are considered as the most important values (Wertekommission, 2016). Overall, 32.3% of the executives identified responsibility as the most important value, followed by trust with 31.3%.

Concerning desirable corporate values central findings were that HR-orientation (20,6%) is mentioned by managers as the most important corporate value even before efficiency or productivity (Wertekommission, 2016). Hereby HR-orientation can be described as the focus on cohesion, value estimation and personal development of employees. As a second important desirable company value seeking for innovation (16,6%) was mentioned.

Links between these identified individual and desirable corporate values and the concept of sustainability were already mentioned before. Due to the fact that the concept of sustainability is well known it is extremely surprising that there is still a large gap between

desirable values which would support sustainability as well as innovation processes and actual values in practice. There is a great discrepancy especially with regard to HR-orientation and seeking for innovation. While 41% of respondents attest that the HR-orientation is a very important value for companies, only around 21% of respondents indicated that their company is primarily characterized by such an orientation (Wertekommission, 2016). Furthermore seeking for innovation indicates a clear gap, too. About 35% prefer the pursuit of innovation as a key value in the company. However, only around 17% of respondents state that this value is particularly visible in their company.

This discrepancy indicates that although the concept of sustainability and the necessity for innovation is well known, nevertheless they are not part of day-to-day business. As a consequence, the discrepancy shows the need for a more contemporary kind of leadership including appropriate circumstances in order to support sustainability and innovation as well as respective individual and desirable corporate values in day-to-day business. An appropriate leadership concept supports companies to act accordingly to the concept of sustainability and it also takes into consideration individual [trust, responsibility] and desirable company values like especially HR-orientation and seeking for innovation. Such a concept of leadership will be shown in the following after describing the difference to existing leadership concepts like servant leadership or charismatic leadership.

### **3 Existing Leadership Concepts**

Silent Leadership (SL) is a leadership theory such as charismatic leadership or servant leadership. And indeed, especially servant leadership is a relating concept because leaders who identify themselves as servants try to support employees as well as their professional development, employees can ask for help if they have personal problems, servants respects the well-being of employees through their own interests, they try to learn from criticism and they give employees freedom (Wertekommission, 2016). All these aspects are usefull for the concept of Silent Leadership. And indeed, the external empirical study figured out that the majority of present leaders identify themselves as motivators or servants. But obviously that is not enough because there is already a gap between desirable and actual values even in companies with leaders who identify themselves as servants. Consequently, a concept like servant leadership can't be enough in order to close the discrepancy between actual and desirable values. In contrast to that charismatic leadership focuses on the charismatic personality of leaders but that is not useful for companies caused in two reasons. First of all, the premise is that leaders are

charismatic. But honestly most of them are not. Furthermore, even if a charismatic leader would be found, the advantage would be gone as soon as the leader leaves the company. Beside that charisma is not equal to value-based behavior. Leaders can be charismatic without taking care of people or environmental issues what is crucial especially for a concept like sustainability. Furthermore, both concepts, servant and charismatic leadership focus on the same aim which is supporting or motivating employees in order to increase resource efficiency in a broader sense (including human resources).

In contrast to both concepts silent leadership contains another aim as well another starting point. Silent Leadership focuses not on the encouragement of employees just in order to be more productive or to increase resource efficiency in a broader sense for the sake of economic effects. Even if the effect is the same, the intention of SL is different. The objective is remaining humanity, not only focusing on economic effects by increasing resource efficiency. Moreover, SL has another starting point. SL focuses not only on the personality or the self-assessment of leaders. It is more about the underlying values which guide them.

SL is about taking care of people based on core values like humanity for the sake of remaining humanity. That is the most important distinction from other concepts and one of the added values of silent leadership compared to other existing leadership theories. Nevertheless, for some researchers this is maybe also the most doubtful point because they argue that business will always focus first of all on profits. But all leaders are humans and in this context humanity should be a core value based on the basic assumption that it is *not* all about the money. A further crucial advantage of SL in contrast to existing approaches especially concerning charismatic leadership is that all leaders have the chance to behave accordingly even if they are not charismatic. Leaders can rather behave accordingly to core values like humanity as becoming a charismatic person. Furthermore, a very essential advantage of SL is that in contrast to charismatic leaders' silent leadership will remain in companies as part of the corporate culture independent from certain persons. That is really important, especially based on the fact that fluctuation is part of daily business. Consequently, there is a great distinction between existing concepts and SL which holds a number of advantages caused in the reasons mentioned before. Thus, SL will be explained in the following.

#### **4 Silent Leadership**

Values are part of an organization's culture which can function as a framework (Lehner, 2006). Nevertheless, stuff won't accept values only because they are written down. So, if companies want to embed the desirable values, they must pay attention to the leaders themselves due to the

fact that culture is nothing without human beings. Leaders must be institution-builders who imbue the organization with meaning that inspires today and endures tomorrow. They must find the common purpose and universal values which can unite highly diverse people such as responsibility, trust, HR-orientation and seeking for innovation. Leaders are crucial for implementing desirable corporate and individual values due to the fact that they demonstrate if proclaimed values only exist in theory and on websites or in daily operations. Only in that case values are really valuable in that sense that people - especially employees - can *trust* and demand them. Such a requirement concerning leadership includes responsibility especially for the own employees which is part of the social dimension of sustainability. Consequently, such a leadership implies HR-orientation otherwise it wouldn't function.

These aspects are part of Silent leadership which pays attention to increasing requirements concerning sustainability and innovation in terms of social, environmental and economic aspects. Silent leadership uses both, the head and the heart. Silent leadership focuses on following aspects:

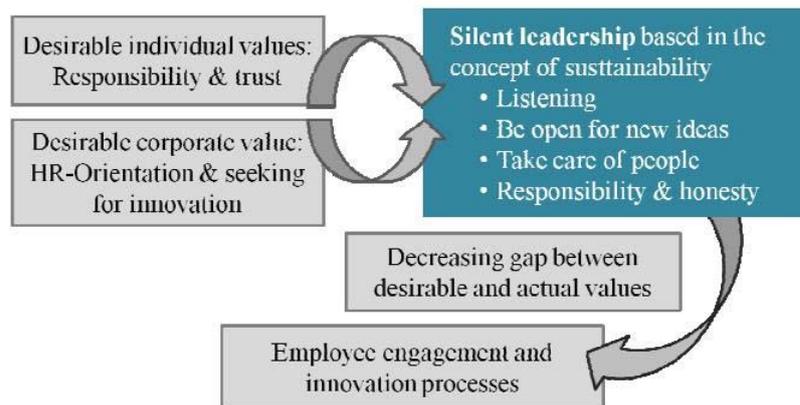
- Listening: Listen to people, especially your own employees, customers and suppliers. Pay attention to their needs, ideas and wishes. By listening leaders can identify key issues in order to create innovative social or environmental solutions. For some managers that might sound bizarre especially if they think they knew everything better than their employees although they are not as closed to operational activities as staff.
- Be open for new innovative ideas of your employees, customers and suppliers because they are closer to processes, products and materials.
- Take care of people: Don't surrender or exploit people like employees or suppliers.
- Responsibility & honesty: Be authentic, be yourself and over all be honest. This means that you trust your employees as well as suppliers like you want them to trust you.

Listening might be difficult for managers who think they should supervise people in order to avert mistakes. But the truth is, people don't like being supervised because it is interpreted as some kind of distrust. Moreover, the best manager can't supervise all processes and people in a way that could be good for a company. Therefore, managers must change their way of thinking. Contemporary leaders are no supervisors or coaches in the first place any more. They should be learners who should listen to their employees, suppliers and customers in order to get new innovative ideas. This implies that managers have to be open for new ideas but people will only give honest response and ideas, if they trust the respective person. However, trust will be earned by taking care of people as humans not only as human resources. In addition, leaders must be

honest. If they are not, people will recognize that within a second and they will lose the trust in you and the company, because every managers stand for the company in which he or her works.

The establishment of silent leadership requires appropriate circumstances focusing on internal and external stakeholders which will be concretized in the following.

**Fig. 1: Effects of silent leadership**



Source: own figure

## 5 Organizational circumstances for silent leadership

### 5.1 Internal framework for silent leadership focusing on employees

In terms of Silent Leadership companies have to create appropriate circumstances which enable managers to act accordingly to the identified individual core values named trust and responsibility and desirable corporate values like HR-orientation and seeking for innovation. Those circumstances can be provided by internal Sensemaking which transfers and anchors sustainability-oriented objectives and values into the organizational knowledge base (Zahn et al., 2008). First of all, this is based on an appropriate modification of the company vision which functions as starting point for institutionalizing sustainability-oriented values and norms (Lehner, 2006). Values form the basis of organizational actions and the expectations regarding individual behaviours because they define which behaviours are accepted and right from an organizational point of view (Weick and Sutcliffe, 2007). Confirmed behaviours manifest then underlying values as an action-imperative, so that sustainable behaviour is rewarded and the opposite will increasingly be rejected by employees. That such a process can happen, the support of the top management and the executives is essential. If they won't act accordingly no employee will pay attention to demanded values. Furthermore, operational modifications should take place (Zahn et al., 2008). An appropriate modification of concrete working contexts

pays attention to responsibility in terms of social aspects especially focusing on employees and HR-orientation as the most desirable corporate value. In that context, appropriate working conditions are necessary including fair wages, appropriate working hours or occupational safety. Furthermore sustainability-oriented leadership also requires measures for personnel development and salutogenetic work design. These measures avoid mental exertions because psychological overloading leads to psychosomatic stress, which would contradict not only the desirable values but also economic (absenteeism) and social sustainability goals.

## **5.2 Structure for silent leadership focusing on external stakeholders**

Silent Leadership focuses on listening to employees but also to suppliers and customers due to the fact that these stakeholder groups are closer to supply chain processes or existing risks which could be averted or the wishes and needs of customers. Therefore, they are important sources of knowledge and ideas in order to create sustainability-oriented innovations which fulfill the requirements of the market. Thus, their inclusion is crucial. As a result, companies have to establish networks like stakeholder dialogs, roundtables or communities' advisory panels which can provide relevant information e.g. in terms of social or environmental risks. Furthermore, companies can acquire relevant information in terms of innovation in progress for the purpose of assessing the public's reactions to planned business activities, to modify them adequately and to prevent errors (Habisch et al., 2008). In addition, network relationships enhance organizational know-how and thereby they also improve organizational skills which are the basis for any kind of innovation (Habisch et al., 2008). Stakeholder dialogues and networks serve as a learning platform and enable efficient knowledge management by incorporating, for example, user-specific knowledge or using the collective intelligence of the network. Through the communication and cooperation with external partners, companies receive important innovation-relevant information both on changed customer requirements as well as on market or social trends (Habisch et al., 2008). Consequently, intact networks and relationships with external stakeholders fulfill an important innovation function because the incorporated knowledge can be used for process and product innovations by taking into account social as well as environmental aspects.

Value-oriented modification of the business processes creates these necessary cooperation and participation structures and involves both, customers (participative product development), cooperation partners (sustainability networks) as well as suppliers (supply chain networks). In this context, participatory product development processes or innovation networks can offer the participation of various external stakeholders. Through the integration of external

networks and stakeholder groups such as customers or suppliers in the business processes (from design to production) improvements are made and participatory learning processes are possible. Participatory processes aim in terms of sustainability-oriented innovation at following aspects (Fichter, 2006):

- Generate interdisciplinary and system-relevant knowledge.
- Gaining orientation knowledge by means of a value-based exchange of opinions, which involves risk assessments and ethical aspects.
- Develop action knowledge by searching for solution and implementation options (in the course of participatory processes), which include both generated knowledge and sustainability-oriented values.

Furthermore Web 2.0 is an important tool in order to involve external stakeholder in a very efficient manner (Weber, 2009). Web 2.0 supports sustainability-oriented innovation processes by supporting innovation and agility in general, productivity, internal and external. These advantages in terms of innovation processes will be concretized in the following.

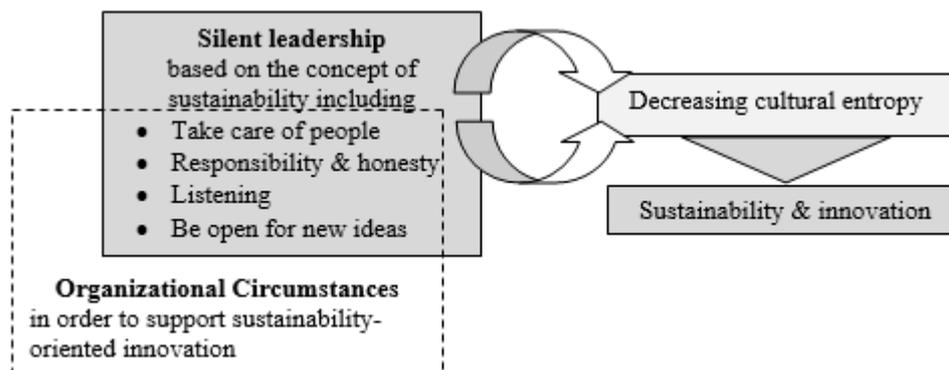
**Innovation and agility:** Innovative networking and discussion forms create impulses for innovation and expand collaborative work in the sense of Open Innovations beyond the departments and company boundaries. In particular in collaborative wikis, the high interactivity through the use of a collective intelligence favors decision-making and problem-solving which serves innovation in general. In this context especially Wikis, discussion forums or Weblogs can integrate internal and external stakeholders into the internal knowledge management in order to promote the development of innovations as well as collaborative work.

**Productivity:** Excessive control becomes a risk factor in a knowledge economy as the motivation of the actors is reduced (Weber, 2009). It is therefore necessary to support the self-organization of internal and external actors. Web 2.0 has significantly reduced the costs for the self-organization of the affected parties. The self-organization and motivation of those concerned can thus be specifically promoted and thus the basis for productive networking of the actors can be created.

**Knowledge networking:** Web 2.0 technologies enable the effective automatic distribution of relevant information and knowledge (Weber, 2009), the integration of external networks and facilitates the interaction and cooperation processes with external stakeholders as customers, investors, suppliers or value-added partners. Through the continuous transfer of knowledge, they are involved in the company processes (from design to production), whereby (sustainability-relevant) information is incorporated and improvements are advanced.

Decision making: Due to competitive circumstances, rapid decision-making is essential to the success of innovations (Weber, 2009). Through Web 2.0, decisions in decentralized corporate structures can be shifted to the operational level. According to study results, the provision of information is regarded as the most important benefit of Web 2.0, followed by information structuring and the social networking of the actors. Companies that face the dynamics of the environment without a centralized control system can better meet the demands of complex markets. Thus, networks that enable personal relationships create a creative intelligence and thus considerably increase the ability to act.

**Fig. 2: Circumstances for silent leadership**



Source: own figure.

## Conclusion

In contrast to existing relating concepts such as charismatic or servant leadership SL focuses on another aim and also another starting point. SL focuses not on the encouragement of employees just in order to increase resource efficiency. Even if the effect is the same, the intention of SL is different. SL is about remaining humanity, not about only focusing on economic effects. Moreover SL focuses not only on the personality or the self-assessment of leaders. It is more about the underlying values which guide them. Based on these ideas the concept of silent leadership which can support sustainability and innovations in companies was developed which pays attention to individual and desirable corporate values. Moreover appropriate circumstances for silent leadership were identified which focus on in- and external stakeholders. SL can support organizations in order to increase sustainability-oriented innovation. In this context silent leadership serves as an appropriate concept for managing the challenges in terms of sustainability and innovation processes caused in a rapidly changing world.

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## CSR AS A MARKETING AREA OF HIGHER EDUCATION STAKEHOLDERS

Hanna Hall

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### Abstract

**Purpose:** The aim of the article is to analyze the perceptions and expectations of key university stakeholders - students, in relation to corporate social responsibility (CSR) of higher education institutions, as the main marketing area of stakeholders of these institutions. The author's studies were completed with the use of FGI (Focus Group Interview). The interviews were recorded using a voice recorder, and immediately after their completion, they were transcribed, the material was selected and ordered according to the research problems, an analysis and interpretation of the content. The results and conclusions drawn from the article were then presented.

**Design/methodology/approach:** The studies were of qualitative character and were completed with the use of Focus Group Interview, among 5 groups of students of Rzeszow University of Technology (PRz). Each group consisted of 5-6 people who volunteered to participate in the study. The studies lasted two months - February and March 2017. Additionally, the study was complemented by "In Deph Interview" with the head of the Career and Promotion Department of PRz. The main purpose of the interview was to know the areas of activity of the University in the CSR. The interview was conducted on 22.03.2017.

**Findings:** The research is in progress, it is assumed, however, that the expectations of students in relation to the social responsibility of the university are the expectations associated with both the statutory activity of the university (i.e. reliable education, upbringing, shaping civic attitudes of students) and additional one (e.g. an attractive education offer to children and young people from the region, supporting charities, activities for persons with disabilities, in favor of sport, arts and culture, environmental protection).

**Research/practical implications:** The results of the social responsibility of universities, and especially those on the expectations of their key stakeholders - students, in this regard, can be effectively used by higher education institutions interested in innovative solutions in the field of marketing. By an implementation of solutions based on the results presented in the article and primary and secondary research, schools will be able to reach out more effectively to candidates as well as to develop its positive - pro-social image among all groups of stakeholders.

**Originality/value:** The subject of social responsibility of marketing in relation to higher education is a new area of theoretical knowledge and practice which is rarely tackled in specialist publications in the area of university marketing. But it seems to be extremely important and future-oriented field of knowledge and looking at a growing interest in CSR in the near future, the standard area of activities of each university.

**Keywords:** higher education marketing, marketing of stakeholders in higher education, social responsibility of universities, university stakeholders

**JEL Code:** I23, M39, I29

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## Introduction

Contemporary universities, operating in a competitive, turbulent environment, adapt market-based methods and tools from businesses, which has become an immanent element of the university marketing process. They have also begun to implement management concepts that are associated with companies and corporations. One of such concepts is instance Corporate Social Responsibility (CSR). As defined by the European Commission in 2001, CSR is "*the concept where companies voluntarily take social and environmental issues into account in their business and relations with stakeholders*" (COM, 2001, p.366; The Communication from the Commission to the European Parliament, 2011, p. 4). However, in 2001, the Commission introduced a revolutionary definition of CSR, according to which CSR is defined as "*the responsibility of businesses for their influence on society*" but the prerequisite for the adoption of CSR is respect for the applicable law and the responsibility for the impact (environmental, social) aims at maximizing the value for a stakeholder and minimizing a negative impact (The Communication from the Commission to the European Parliament, 2011, p. 7).

The main motives of the process of CSR implementation, its ideas, principles and methods for the university are numerous, including mainly the image-based benefits of applying this concept (see: Atakan & Eker, 2007; Stensaker, 2007; Porter & Kramer, 2006; Melewar & Akel, 2005) to all groups of stakeholders and the creation of long-term, positive relations with the local community.

Issues of CSR have always been a part of the educational mission of higher education institutions, but nowadays, through implementing CSR strategies, higher education institutions are using this approach as a part of their competitive strategy (Dahan & Senol, 2012, p. 95).

Universities realize the essence of CSR in many areas. Authors of scientific publications usually separate several different levels, e.g. B. Rok (Rok, 2008, p. 4) distinguishes: social, systemic, market, ecological and public areas (see also: Carroll, 1991, p. 12). Thus, CSR activities can be defined as extremely diversified. Internal stakeholders should be its focal points, among them students and staff. However, students who are the subject of research in this article, are of the utmost importance in terms of an image and an opinion.

The aim of the article is to analyze the perceptions and expectations of key university stakeholders - students, in relation to corporate social responsibility (CSR) of higher education institutions, as the main marketing area of stakeholders of these institutions.

The results presented in the article can be an important source of information for university authorities engaged in CSR activities and interested in their perception by students,

as well as an inspiration to make further actions which are beneficial for the university and positively received by students in this field.

## **1 Social responsibility of higher educational institutions in the literature**

The stakeholder theory has been discussed for over thirty years (Freeman, 1984; Post, Preston & Sachs, 2002), but the authors were rarely involved in pure marketing at this time (Hall, 2015a; Hall, 2015b). Stakeholder marketing represents the orientation of companies that, in their marketing efforts, go beyond just taking into account the interests of their customers, including those who may have an impact on their business (see: Bhattacharya & Korschun, 2008, pp.113-116). In the case of higher education their stakeholders are classified in different ways. The most common is the division into internal stakeholders that include students, employees, university authorities, the Senate, the Convention, and external ones - they are candidates for studies, graduates, ministry (Polish Ministry of Science and Higher Education), accreditation board, other universities, business representatives, organizations related to the labor market, representatives of local governments, media, local community) (Wańkowski, 2015; Jongbloed et al., 2008; Matlay, 2009).

Therefore, CSR is their responsibility for the influence they exert on individual stakeholder groups. The social responsibility of the university consists of (compare: Geryk, 2010, pp. 26-30):

1. Activities related to the statutory function of the institution, performed with due diligence, honesty and commitment (primarily addressed to students - among others their fair education, upbringing, shaping of views),
2. Additional activities, which include:
  - educational activities for other groups (than students) - for children, youth from lower secondary schools, disabled people, seniors, companies;
  - activities of a different nature than education directed at both students and other groups (culture, art, sport, environmental protection, charity and others).

The activities of the university in the field of CSR for students should take into account their expectations, which generally include, first and foremost: obtaining a university diploma, adequate preparation for work, allowing for a global job market, a possibility of participating in student life, a wide range of universities offering lifelong learning (Białoń & Werner, 2012, p.145). The expectation of students, however, is still relatively rare in empirical research.

## **2 Methodology of research**

The objectives of the research were to identify the level of knowledge, opinion, experience and assessments of students involved in corporate social responsibility (CSR) of universities. The author's research was particularly important in identifying the most important students' views of the university practices in the analyzed area as well as their expectations about future CSR activities.

The studies were of qualitative character and were completed with the use of FGI (Focus Group Interview), among 5 groups of students of Management Faculty of Rzeszow University of Technology. Students were recruited to each group from different years ( the second and third year of the bachelor's studies and the second year of master's studies), different majors (finance and management) and different modes (3 groups from full-time and 2 groups from part-time studies).

The selection of units for groups was the selection of typical units (non-random selection). Each group consisted of 5-6 people who volunteered to participate in the study without knowing the purpose of the study. The purpose of the research was given to them only after the recruitment to the study to avoid the situation that only those with a higher average student knowledge related to the topic would report to be tested. The measurement tool was a low standardization scenario. The studies lasted two months - February and March 2017.

The interviews were recorded using a voice recorder, and immediately after their completion, they were transcribed, the material was selected and ordered according to the research problems, an analysis and interpretation of the content. The results and conclusions drawn from the article were then presented.

Additionally, the study was complemented by an individual interview ("In Depth Interview") with the head of the Career and Promotion Department of Rzeszow University of Technology. The main purpose of the interview was to know the areas of activity of the University in the CSR area as well as to identify the areas of key importance for the image of the university according to the university representative. The interview was conducted on 22.03.2017. The following measurement tools were used: the medium-level standardization scenario and a voice recorder. The author's intention was also to confront students' views on CSR activities with the opinion of the management of the aforementioned department that deals with the planning and implementation of these activities.

### **3 University CSR – research results among students (FGI) and the head of the University Career and Promotion Department (IDI)**

The first question concerned students' understanding of the CSR concept in relation to the university (the study was conducted among students of management so it was assumed that the concepts of CSR did not need to be explained). Students mainly mentioned shortly the types of activities that they believe belonged to university activity in CSR, although there were also more complex definitions:

- *"It's building relationships with other candidates for university"*.
- *"It is the involvement of the university in charitable actions"*.
- *"Cooperation with companies, on an exchange basis - I promote a company in my environment, for example, it publishes its banner at conferences and the company does something for the university - for example, accepts students for internships or employs them"*.
- *"Collaboration with companies to find jobs for future graduates"*.
- *"Organization of student events"*.
- *"Organization of open days for future students and other events such as the open days for high school graduates"*.

According to the analysis of the answers to this question, the most frequently mentioned in the researched groups of activities were charity actions, including volunteer work and students, promotional activities directed to candidates for studies (mainly open days) and non - statutory activities of universities addressed to students. In this last area, Juwenalia (Student's Days) were frequently mentioned, the participation in the "Erasmus" program, organizing student conferences. Students are much less likely to draw attention to the actions that promote learning.

The students of extramural studies emphasized and exchanged more frequently the activities of the university related to business cooperation, especially with regard to facilitating students to find a job.

The next question was about CSR areas in which students should be particularly active. Below there are presented selected, most frequently repeating answers of students:

- *"Employers should be encouraged to prepare students for employment because students are sometimes surprised after graduation that they do not meet the requirements"*.

- *"Collaboration with companies operating near the University of Technology, in the field of cultural services, such as cinemas".*
- *"It should also cooperate with other universities, for example we have recently had lectures with professors from Brazil".*
- *"The University timetable should be planned more ergonomically because it is very inconvenient for us.*
- *"We should be better informed about CSR operations, such as sports, I have not known until recently that we have such good teams".*
- *"Help to find a job for students."*
- *"The education of students should be in such a way that they can then find work and develop in a given area and not leave the country."*
- *"Supporting business innovation by providing qualified staff."*
- *"Help with starting your own business."*

As a response to this question, there were definitely more answers related to university-business relationships, also in the groups that consisted of full-time students. One can say that they dominated this part of the study. However, there are also interesting, though single, statements about student dissatisfaction related to organizational issues (related to timetable), insufficient information to students about some of their interesting activities (e.g. in the field of sport) as well as the expected cooperation between universities and other universities. The answer to the question of which of the above-mentioned areas of study students consider the most important, it was emphasized again the cooperation with companies, primarily *"to find a better job"*. Often, the reply about Student's Days was also repeated.

It was also asked the question whether the university should boast of its CSR efforts (the author was interested in the ethical aspect of this activity), in line with the public relations principle *"Do it right and talk about it loudly"*. They all stated clearly that the actions should be taken because of the image of this activity and the intense competition in the university education sector. It has been emphasized, however, that over-exaggeration in information dissemination, and especially in charitable activities, can be misleadingly perceived. The attention was paid to the need for a balance between the importance and scope of CSR activities and the intensity of its publicity. One of the students said, *"Well, unless it's open days, it's the kind of publicity that's most likely to be shared by so many people"*.

Students were also asked about the purpose of the university's CSR activities. All groups emphasized *"creating a good opinion of the university"*, *"creating an image"*, they also pointed

out to the need to interest in the company's business as well as "*attracting as many students as possible*".

The latter answer turned out to be particularly interesting in the aspect of the next, last question, whether students were paying attention to CSR activities in the university selection process. In none of the groups, there was any single person who would admit that they had taken into account the social activity of the university.

The first question posed to the head of the Career and Promotion Department concerned the priorities in the CSR area of the University. As the most important area of the university social responsibility, the head recognized the scientific openness of the university to the entire community of the region: "*We want to be seen as an open scientific space for the region. We want to infect people with science. We want science to be attractive even for 5-year-olds. And there is huge interest, which we are very happy about. We also encourage employees to make this scientific openness to society. We organize many meetings with employees for this purpose. It is extremely important for us to establish a relationship and interest in the university among future students, which is obvious, but also with the teachers and with any other person in our area who can be interested in science*".

When asked about other areas of CSR undertaken by the university, the head stressed that a lot of activities were taken by students of students scientific circles. "*Our students are amazing in this respect. We have exceptional students. They take on the lion's share of the work. They are very involved and have a lot of ideas, they take a lot of initiative. Let's take, for example, "Santa Claus" charity actions, where students collect money for children's homes, "Three hearts" campaign within which the Internet auctions are run, where money is spent for sick children. [...] They are also willing to go to school for information and participate in trade fairs*".

The emphasis is also put on sport and culture. "*We do everything to make our sport very visible, especially since we have 16 sports sections and a great table tennis team, one of the best in Europe. But the budget for the development of sport is very low. We need to constantly seek sponsors*".

The head was also asked about the importance and the scope of cooperation between the University and business. "*Working with business is a very, very wide topic. We are working with a lot of companies that create opportunities for our students and graduates*". The head gave a few concrete examples of cooperation, but the thematic area, however, was a subject of a separate interview due to its size.

## Conclusions

According to the research conducted, the students have good orientation in the actions taken by universities in the field of CSR. This is confirmed by the actions taken by the head of the Career and Promotion Department responsible for this activity. They were able to name many examples in both the primary and secondary areas. Slightly more examples from different levels of CSR were provided by full-time students who enumerated the activities addressed to candidates for studies, students at different levels of education, children as well as business. It was definitely noticeable that they were closer to the university than part-time students. The majority, mostly working people, focused mainly on university-to-business relationships, primarily on the need to educate students in such a way that they have the skills and qualifications to enable them to find attractive work. They also stressed the need for the university to focus on the research and development work needed in collaboration with business. The importance of the issue of university cooperation with the labor market, which turned out to be the key expectation of students towards CSR activities, was also clearly emphasized by students of full-time studies, but was mentioned alongside other activities, particularly charitable activities.

The primary focus of the university CSR activities is the opening of the university to the environment, the interest of the region's community in its activity, especially the development of science. This does not mean, however, that the expectations of students and the university differ. The area of business cooperation, including the creation and maintenance of relationships with future employers, turned out to be an extremely comprehensive subject of immanent university functions, an element of its "everyday life" as well as the fundamental duties of the Career and Promotion Department.

The results of the presented research may provide the basis for further quantitative research, as well as serve as a source of information for faculty and / or university authorities interested in CSR, particularly the perception of students in this area.

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## PROJECT MANAGEMENT IN THE CZECH REPUBLIC: IS IT TIME FOR INNOVATION?

Majra Hodžić – Helena Hružová

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### Abstract

**Purpose:** The importance of project management has hastily increased and its rapid development and tendency towards innovation made it one of the key components of the organizations' performance. Therefore, the main purpose of this paper was to conduct a systematic study of the current situation and practices in the field of project management in the Czech Republic. Three areas of project management are closely studied: stakeholders' main demands and requests, main characteristics of project management and level of use of the project management methods.

**Methodology:** The study consists of the analysis of primary and secondary data. The cross-sectional online survey comprising of 3 parts was conducted in 2016 in Czech Republic and yielded 118 usable responses. Furthermore, the results of the author's survey were compared with the results of similar surveys from the last 5 years. Kruskal-Wallis test has been used to support the claims.

**Findings:** The survey showed that working in project management is arduous. There is an increase in the level of use of basic project management methods. Moreover, there is a link between the definition of successful project and project success factors and stakeholders' demands of the projects. Finally, there are important empirical insights showing broader implementation of project management, although no essential overall progress was noted in the project management in the last 5 years. Thus, project management is a field for innovation.

**Research:** This study indicates the necessity of innovation such as development of the basic framework for the project governance approaches as well as increase in the use of available project management methods. Future research should focus on analysis of the overall status of project governance approaches as well as on the issues of determination of project scope and risk management within projects.

**Value:** This study looks at the project management from the multi-factor perspective and addresses the current situation indicating innovative directions of development as well as broader application of project management methods, which are not much researched in the region.

**Keywords:** Project Management, PM Methods, Innovation, Stakeholders

**JEL Codes:** M00, M10, M19

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## **Introduction**

Project management can be declared in many ways and has many generally accepted definitions. The core of all of them is the same and with regards to the purpose and hypothesis of the paper. The most applicable definition is stated by PMI (2013, p. 5) as „Project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements “.

While the substantive content of project management is essentially unchanged for the nearly last twenty years, the framework and approach have undergone innovative changes. This corresponds with the view of modern approaches in the management which basically means that the essence is not in learning and implementing the methods and software, but in embracing the complex, overall approach of the project management. This overall approach includes also project sustainability which is defined by European Commission (2004, p. 146) as the “likelihood of a continuation in the stream of benefits produced by the project after the period of external support has ended”. Sustainable development is even considered (Gareis, 2013) as a new management paradigm for managing projects in complex and dynamic environment. Project management has been increasingly used in various business fields as well as by different entities from start-ups, small companies up to multinationals. Project management serves as a very valuable application platform for entrepreneurial innovation process.

Although project management is one of the most popular disciplines of the management and has highly beneficial standardized practices, it is evident from the previous researches that in the Czech Republic, project teams cope with many issues and unsuccessful projects. The main purpose of this paper was to conduct a study of the current situation and practices in the field of project management in the Czech Republic.

## **1 Research and Results**

### **1.1 Research Question, Hypothesis and Methodology**

In order to address the situation properly, the study focuses on the three areas of project management: stakeholders’ main demands, main characteristics of project management in the Czech Republic and level of use of the project management methods. The research question arises from observing the current situation: is it time for innovation and boost of the project management in the Czech Republic?

According to the research question and the purpose, the main premise is the following:

**H1** *Project management in the Czech Republic has been progressing significantly in the last few years.*

This premise can be broken into sub-hypotheses upon focus areas studied in this paper:

**H1.1** *Stakeholders' demands and project success factors influence how successful projects are perceived.*

**H1.2** *Project management in the Czech Republic is shifting from traditional towards innovative, agile approach.*

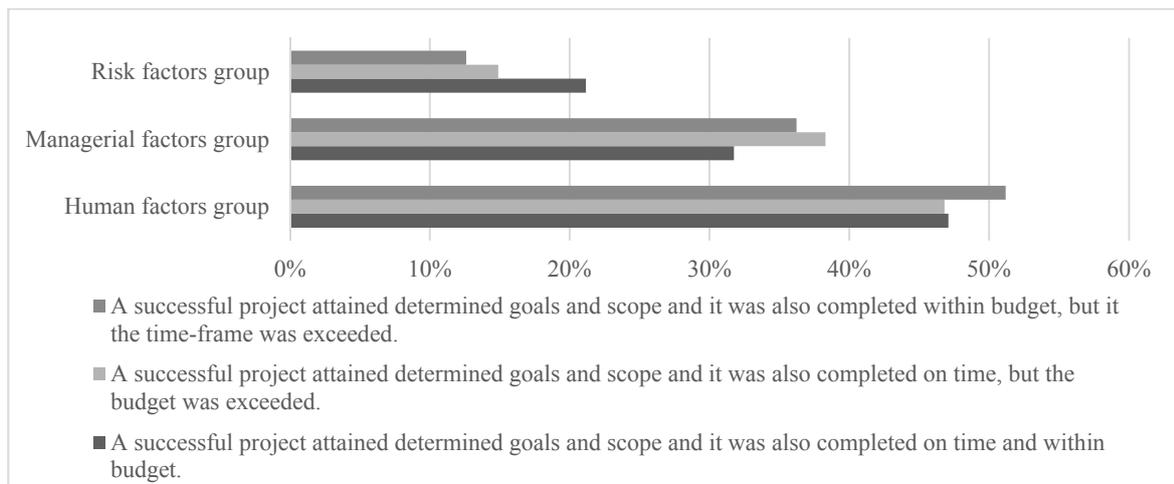
**H1.3** *There is an increase in the use of project management methodology (methods).*

The study consists of the analysis of primary and secondary data. The cross-sectional online survey conducted in 2016 in the Czech Republic yielded 118 usable responses. The results were compared with the results of similar surveys from the last 5 years. There were twenty questions in total and questionnaire had both open and closed questions. In addition to that, there was a complex matrix used for identification of project management methods used.

## **1.2 Project Success Factors and Stakeholders' Demands**

### **1.2.1 Influence of Project Success Factors**

Respondents could choose factors belonging to three different groups – risk, managerial and human factors. The accent was on choosing the main (key) factors. The Fig. 1 shows the relationship between understanding and defining the successful project and main success factors that influence projects' success. The respondents could define the successful projects by following the general accepted Project Management Triangle. The first option was the most rigorous as the project is considered successful only if it fulfills all three constraints – scope, time, and budget. The second option presumes exceeding the budget while fulfilling the scope and time and the third options assumes exceeding the time, but satisfying the defined scope and budget.

**Fig. 1: Success of Project and Success Factors**


Source: authors

Human factors, which are most intangible and unpredictable, are the key ones even though most managerial factors are given and relatively fixed (such as financial and human resources, scope and requests of the project, etc.) and that risks represent the threats or potential opportunities for the project. Effective communication within and outside the team, highly-skilled and experienced team and team sharing the same goals and motivation to attain the best results were included in human factors. Consequently, the most influential factors chosen were human factors and at the same time, the highest ignorance was towards importance of the risks. Majority of respondents chose the most rigorous definition of successful project too.

The group of respondents that perceive the project as successful although time-frame was exceeded had the most significant difference between the factors group as human factors take up 51% of all answers. This could presume the relationship between the exceeding the time-schedule and human factors that could affect it - the better the communication and coherence within the team, the least time exceeded.

The smallest difference between the human and managerial group factors was among the respondents who are tolerant towards exceeding the budget (9%). As budget is usually given externally, its relationship with managerial (external) factors is evident. At first, exceeding the budget can only be accepted if allowed by the management (sponsor) and it is also very often conditioned by unsuitable financial and human resources assigned from the beginning. Furthermore, imprecise definition of scope and conditions can easily lead to budget exceeds as well.

Group of risk factors included identification, timely management and prevention of risks activities and gained the lowest number of responses. In the times of turbulences and

unpredictable development this was surprising result. It can be assumed that thorough risk management has not been yet recognized as important part of project management in the Czech Republic. This can be linked to the relatively high rate of unsuccessful projects in this field. Insufficient attention to the risks can be identified as one of the main weaknesses and limitations of the project management in the Czech Republic.

### 1.2.2 Influence of Stakeholders' Demands

Successful project definition was also analyzed through its connection to the stakeholders' demands. The same principle of three groups of human, managerial and risk related demands was used and respondents were supposed to choose the most relevant ones. Human group included sufficient number of team members as well as approach to working on weekends if needed; managerial group included following procedures and rules of the organization and escalation of problems to the higher levels of management; risk group consisted of reaching expected outputs no matter the risks as well as acceptance of the project no matter the conditions.

Verbal data for stakeholders' demands were converted to numerical answers of each group of stakeholders using the following: 1 (human group), 2 (managerial group), 3 (risk group). The weighted averages of these groups of stakeholders' demands were calculated per the amount of chosen demands (belonging to each group) taking into consideration how the respondents defined the successful project.

**Table 1: Main Stakeholders' Demands**

Successful Project Definition	Weighted Average
A successful project attained determined goals and scope and it was also completed on time and within budget.	1,71
A successful project attained determined goals and scope and it was also completed on time, but the budget was exceeded.	1,66
A successful project attained determined goals and scope and it was also completed within budget, but the time-frame was exceeded.	1,80

Source: authors

As weighted averages of all three definitions tend to 2, it seems that main stakeholders' demands expected are from the managerial group and the least from the risk group. It is also evident that the risks are one of the weaknesses of the project management in the Czech

Republic. Statistical significance of this indication will be verified by the Kruskal-Wallis test on human factor group.

### 1.2.3 Statistical Verification

Since the data analyzed are empirical and non-parametric, have different variability and the comparison of three independent samples of different sample sizes is needed, the Kruskal-Wallis test (Pecáková, 2008) was used.

$$H_{KW} = \frac{12}{n(n+1)} \sum_i^r \frac{Ri^2}{ni} - 3(n+1) \quad (1)$$

$$\text{Thus: } H_{KW} = 7,9428$$

The Kruskal-Wallis uses testing by ranks and specifies whether minimum one sample stochastically dominates over another. The H-value is compared to the critical chi-squared distribution with  $r - 1$  degrees of freedom looking at the 95% alpha level (Pecáková, 2008). This value is given by table of chi square values (Pecáková, 2008). If H-value is higher than critical value, the dominance is significant and vice versa.

$$\chi_{0.95}^2(2) = 5,99 \quad (2)$$

$$\text{Thus: } H_{KW} > \chi_{0.95}^2(2)$$

The result confirms stochastic dominance and therefore, none of the three groups is dominated. The same results are valid for other two groups due to rank-based test and equal number of responses for the perception of project success.

Although results in Table 1 indicated that main stakeholders' demands are from managerial and least from risk group, its statistical significance was not confirmed by this test. It is clear that statistical validation shows different, more specific results than weighted averages.

Obtained results and statistical analysis confirm the H1.1, meaning that stakeholders' demands and project success factors influence how successful projects are perceived.

## 1.3 Main Characteristics of Project Management

Main characteristics outline the approach used and overall status of the project management. This segment also provides valuable information for entrepreneurship in the Czech Republic, especially for innovative start-ups. The trend of highly potential start-ups is growing and entrepreneurship spirit is on the rise. Agile, innovative project management can enable smooth

start and effective, systematic organizational performance enabling long-term success and sustainability.

One third of the projects are primarily involved in IT systems, while development of the new product/service and process management takes up 18%, respectively 14% of the projects. These areas are important innovation drivers as innovation is one their key components. Therefore, project management is moving towards right direction and there is at least basic awareness of the necessity and importance of innovation today. In addition to that, 20% of projects focus on modernization of technical equipment and educational trainings for employees (10% each). Both factors lead to sustainable development of any business entity. Important segment for identification of traditional or agile approach is the duration of the project too.

Reorganization projects are projects with shortest overall duration – 83% project last up to 12 months. However, per the research, only 5% projects are involved in this area.

Average duration of IT projects is approximately one year or shorter. More precisely, 51% of the projects have duration 6 – 12 months while 28% last up to three years. Although there is almost one third of the IT projects that last up to three years, it is evident that majority of them are short-term projects which corresponds with innovative, flexible and more agile approach. Other types of projects attained similar results. 82% of projects for development of new product/service are approximately one year and only 3% up to three years. This corresponds with the need for regular innovations in the market due to rapid changes, increased flexibility and stiff competition.

#### **1.4 Usage of Project Management Methods**

The questionnaire contained complex matrix aimed at identification of mostly used methods. Matrix contained 38 effective project management methods (and tools) that could be used in different phases. The respondents were asked to assign methods just to one project cycle phase due to technical possibility of survey processing although some of them are suitable for more than one phase.

Feasibility study is the most used and probably most known method outside project management. More than half of the respondents use it during the pre-project phase and it is primarily used to show whether the project should be realized or not.

During planning phase, Work Breakdown Structure is the most extended method. Its popularity has been growing recently thanks to its clear output. Besides being the prevalent method of planning phase, WBS is the second most used phase out of all 38 methods included in the matrix.

The most accepted method out of all 38 ones and at the same time mostly used in the after-project phase is the Lessons Learned tool. Almost two thirds of respondents use this tool which indicates its benefit for sharing experience, increasing knowledge, learning from mistakes as well as preventing occurrence of negative events that could be predicted.

## **2 Comparison of the Results of Different Surveys**

The results of the following surveys were compared: IPMA CZ surveys conducted in 2012 and 2015, EY (former Ernst & Young) surveys conducted in 2013 and 2015 and author's survey conducted in 2016 as a research for the master's thesis.

When defining the successful project, the respondents of all mentioned surveys agreed that fulfillment of the scope of the project is a key component. Simultaneously, determination of the scope of the project was identified at the same time as one of the main success factors (if done precisely and successfully) and one of the "problem areas" leading to failures of the projects (if not specified precisely and correctly).

The results of the surveys showed steady growth in the number of projects since 2012 and variety of the topics addressed by projects. However, the rate of the unsuccessful projects is still relatively high according to compared surveys. Consequently, there is a growing need for the application of innovative, more sustainable approaches and methods.

When it comes to methods used, all surveys focused on the most used (most popular) methods and results were different. However, currently used methods in the last five years in all surveys are common methods of the traditional project management. The least used were agile project management methods.

## **Conclusion**

The analysis of the results of the survey showed prominent relationship between perceiving (defining) the successful project and identified success factors and stakeholders' demands. At the same time, the implementation of project management in many different areas of business is increasing which makes the stakeholders' demands subject to change and influential to the perception of the successful project. These results confirm that stakeholders' demands as well as project success factors affect how success project is interpreted, therefore confirm H1.1.

Taking into consideration the results of the survey regarding the transformation from the traditional to agile project management and basic characteristics of both approaches, it is

evident that transformation is present in only a small number of IT organizations, mostly big multinational corporations.

This means that overall status of the project management in the Czech Republic is still more oriented towards traditional approach than agile, but it at the same time provides great motivation for entrepreneurs, not only in the IT field, to benefit from agile approaches. Moreover, this can be one of the drivers for project managers and project management experts also in the Czech Republic to focus on this type of innovation and use it for improvement in terms of flexibility, timing as well as making it leaner. However, at this moment, the results dismiss the H1.2.

Comparison of the results of the different surveys showed that there is an increase in the use of the same project management methods, however, the broader usage has not been proven. Accordingly, H1.3 was partially confirmed.

Taking into consideration the results of the survey conducted as well as the results of other surveys, it is evident that it is high time for innovation in the field of project management in the Czech Republic. Basic PM methods, traditional approach and static, risk ignorant perspective is not sufficient nor effective in today's project management. Agile methodology, risk monitoring and prevention as well as project governance approaches reflecting stakeholders' demands are the new directions project management must head to.

These directions will not only improve project management, but will also boost the entrepreneurship spirit and help modern, highly potential start-ups to be competitive in the market. Largely, modernized and innovative project management will positively influence all areas of business in the Czech Republic and maintain better position of stakeholders.

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## FACTORS AFFECTING PERFORMANCE OF EMPLOYEES IN SMEs

Darja Holátová

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### Abstract

**Purpose:** Performance is one of the most important conditions of successful existence of firms in the market. The performance of an enterprise is made up of individual labour productivity of employees. It is influenced by many factors. The paper deals with the influence of some factors of human resource management at employee individual labour productivity in small and medium-sized enterprises in the region of South Bohemia. The factors in this paper are the following: monitoring of the objectives of the company, determine company's strategy, the existence of trade unions in the company, drawing up the plans of the number of employees.

**Design/methodology/approach:** Our database uses both quantitative and qualitative data. The data from the documentation of an enterprise were used, such as the value (financial) indicators of production and non-production activities, including financial analysis, and the data on human resources. Economic data were also obtained by tracing in annual reports and reports of financial results of the enterprise. A questionnaire survey was a part of the research. The research sample includes 300 SMEs from South Bohemia, which were chosen by random selection.

**Findings:** The Paper explores the factors influencing the Performances of employees in small and medium enterprises in the region. The data obtained and the results show that the factors affecting the performance of employees only include checking the fulfilment of objectives. Work performance decreases with decreasing frequency of checks.

**Research/practical implications:** This paper deals with the influence of selected tools of human resources management in small and medium-sized enterprises on the work performance of employees. Individual labour productivity was calculated by value added divide to re-count number of employees, which is the most exact methods.

**Originality/value:** This paper identified which tools of HR management can influenced the output of the SMEs.

**Keywords:** HR management, SMEs, Work productivity

**JEL Codes:** M00, M12, M50

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## **Introduction**

The development of small and medium enterprises helps reducing unemployment. This group of enterprises is faster and more responsive to changes in demand. The disadvantage compared to large enterprises are situations where non-usage of capacity options will increase production costs, which can be considered a barrier for further development, or may even cause the enterprise's closure under extreme circumstances. Another disadvantage is the focus of SMEs mainly on local markets; therefore, it is difficult for them to enter beyond, such as the foreign markets. A common problem is the lack of funding for research, development, education and training of employees.

As reported by Holátová, Doležalová (2015), management of small and medium enterprise has many specifics. In small enterprises, the low number of employees and managers cumulates many functions as the responsibility of only a few workers. Small businesses are also characterized by predominance of oral communication over written communication (Březinová, 2013). The aim of SMEs is an effective procedure that leads to the achievement of competitive advantage (Chadswick, 2015). In order to allow the company to successfully meet its objectives, it is desirable to achieve harmony between business objectives and human resource management. In hierarchically controlled society, people do according to what they are evaluated, first of all. Therefore, it is very important that the enterprise established performance indicators, measurable variables that are in accordance with its strategic objectives. Prerequisite for achieving the enterprise's strategic goals is the ability of managers to invest in human resources in the desired direction and to assess the return on such investments based on an analysis of costs, revenues and anticipated risks, and in other areas of corporate governance. Currently, more and more small and medium enterprises see their human capital and its productivity as one of the key success factors of the quality. Previously, it was possible to evaluate the productivity of human labour methods precisely by specifying individual procedures and operations such as work standardization. Nowadays, the demands on labour and its quality are much greater and the quality of human capital is also seen in a much broader context.

With the growing share of services in the economy, work based on mental abilities and skills, which cannot be assessed and measured by such variables as the standard quantity and quality, has increased. It is therefore necessary to use a scale which corresponds to today's requirements for evaluation and human resource management (Bissola, Imperatori, 2013). Labour productivity expresses the volume of produced values per a unit of consumed work for a certain period (year, month, day, hour) depending on the period of monitoring. By Fiala et al.

(2013), it is the ratio of outputs to inputs (total output divided by labour inputs). Labour productivity increases when the same amount of inputs produces multiple outputs. Furthermore, according to Jose (2013), labour productivity increases due to improved technology, higher labour skills and capital deepening. Specifically, productivity is influenced by skilled labour, but also by the productivity of other factors of production, engaged in production. It is influenced by management and technological methods of an enterprise – it means how the enterprise is able to utilize the knowledge capital and other factors of production (Ngwenya, 2017).

The simplest calculation of labour productivity indicates how many CZK was created by one employee per a shift, a month, a quarter, or a year: Labour productivity = output (output, turnover, added value) / Number of employees (hours worked). This calculation of productivity is used in our paper (Vaničková, 2015). Labour productivity is also classified by different units of work. If this unit is a human activity (work done by a person measured the price of labour - wages), we call it the productivity of living labour. If a unit of work is considered work contained in all the inputs into a certain transformation process (resulting into production of values), we call it the social labour productivity (measured by the cost of all inputs into the production process - the price of living and materialized labour).

At the level of different organizations (enterprises, associations and companies) that produce specific values, it is possible to express the volume and values produced in details - not only as the monetary volume, but also in natural units (pieces, kilograms, meters, etc.). Consumption of work at this level is often referred to as the cost of living and materialized labour (Vaněk & Vaničková, 2015). In our research we would confirm that more factors are influential individual labour productivity, some of them are from management, we would like to find them and confirm by the statistic way and recommend it to the management of small and medium size of company like a tool for increasing of individual labour productivity, instead to very expensive tools like improved technology, higher labour skills and capital deepening.

## **1 Methodology**

Classification of the sample enterprises was done by Act 47/2002 Coll., on Support for Small and Medium-sized Enterprises, as amended, which refers to the definition of small and medium-sized enterprises (SMEs) pursuant to Commission Regulation (EC) no. 70/2001 Coll., the amendment to Act no. 364/2004 Coll., Appendix 1 (European Commission, 2008).

The categorization was carried out based on three basic criteria: number of employees, turnover and assets and an annual balance sheet total.

**Tab. 1: Classification of SMEs.**

Size of enterprise	Number of employees (AWU)	Annual turnover	Annual balance
Medium-sized enterprise	50 – 249	< 2500 mil. CZK	< 1075 mil. CZK
small enterprise	10 – 49	< 250 mil. CZK	< 250 mil. CZK
Micro-enterprise	0 – 9	< 50 mil. CZK	< 50 mil. CZK

Source: (European Commission, 2008).

In the region of South Bohemia, there were 66,514 (population) economic entities registered within the selected category in 2015. The sample included 96% of micro-enterprises (61 560); 3% of small enterprises (2349) and at least 1% of medium-sized enterprises (608). The research sample included 1,075 enterprises with available economic data. All enterprises in the sample (1,075) received our questionnaire. We got 325 of the questionnaires back, 25 out of which were excluded because of the inadequacy of the response.

Characteristics of the sample (300 companies) are as follows: micro enterprises with up to 9 employees represent 19%; small enterprises are represented by the largest number (49%), despite representing only 3% of all SMEs in the region. Medium-sized enterprises are the most common in the district of České Budejovice, which is associated with better conditions for business (infrastructure, easier connections with institutions supporting the development of SMEs, etc.). In the region, there were 608 registered, representing the lowest share of the total number of and so they represent only 1% (Czech Statistic office, 2014). As a part of the sample, these companies represented 32%

**Tab. 2: Structure of the sample of small and medium-sized enterprises by number of employees.**

Number of employees	Enterprises per cent	
0 – 9	57	19 %
10 – 49	147	49 %
50 – 249	96	32 %

Source: Owen research.

The average age of the enterprises in the sample is 16 years, the oldest enterprise within the research sample is 50 years old, the youngest are one year old. Most enterprises (58%) are older than 15 years and 25% of them are younger than 10 years.

The sample was divided by type of business as follows: there were 82% of limited liability companies (s.r.o.); 13% of the trade certificates; other forms were underrepresented, the number of enterprises ranging from one to four in the total number of 300. The research sample (1075) was selected by non-probabilistic method of random selection from the population (66,514 enterprises), because of the difficult conditions of data collection. The research sample generated sample examined, which consists of 300 small and medium-sized enterprises with its activities in South Bohemia. For this paper we chose calculation of labour productivity which indicates how many CZK was created by one employee per year: Labour productivity = output (added value) / Number of employees (hours worked).

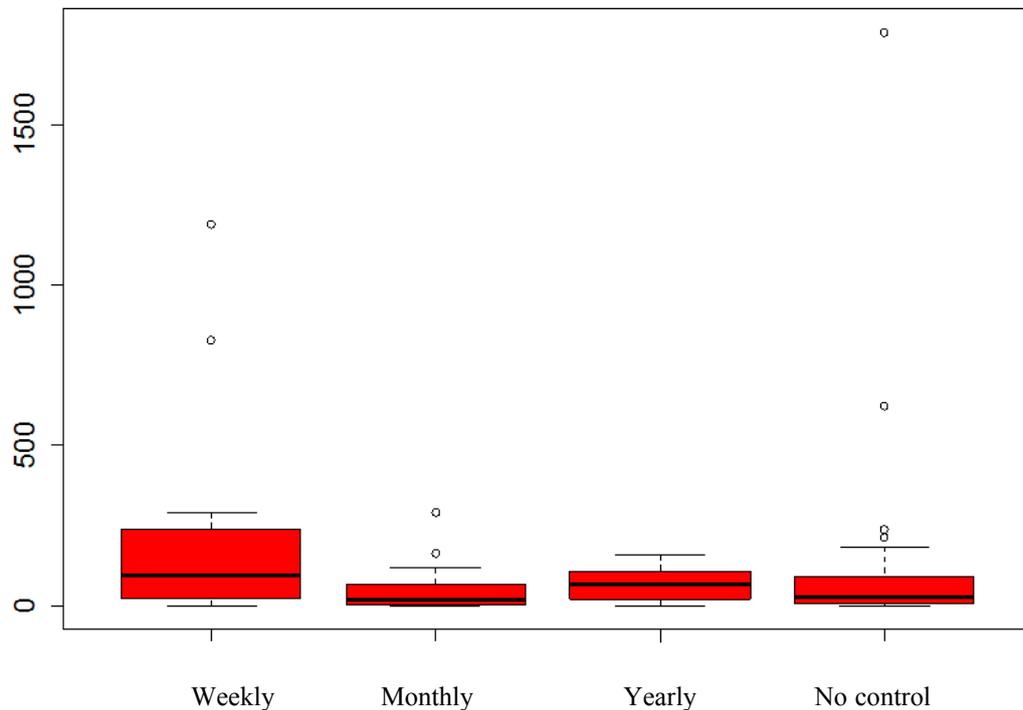
## **2 Results**

As reported above, the paper deals with the evaluation of some factors in the field of Human Resources Development in connection with the performance of employees. The factors discussed in this paper are reviewed below.

### **2.1 Monitoring of the objectives of the company.**

The first factor where we verify his influencing the labour productivity in the sample is the monitoring of enterprise's goals. A series of box-whiskers diagrams was used to illustrate the relations between the objectives monitoring and the labour productivity. Spearman rank correlation coefficient was also determined, ranging to -0.2093173. Spearman correlation coefficient value in this case can be interpreted as a weak association dependency. Due to the coding of each level, it is also possible to say that employee performance decreases with decreasing frequency of checking that the objectives and plans. However, as already mentioned, this association dependency is weak, but statistically significant of the p-value = 0.01684. Regular monitoring of compliance objectives is thus one of the tools that can be recommended if the enterprises want to increase the performance of their employees.

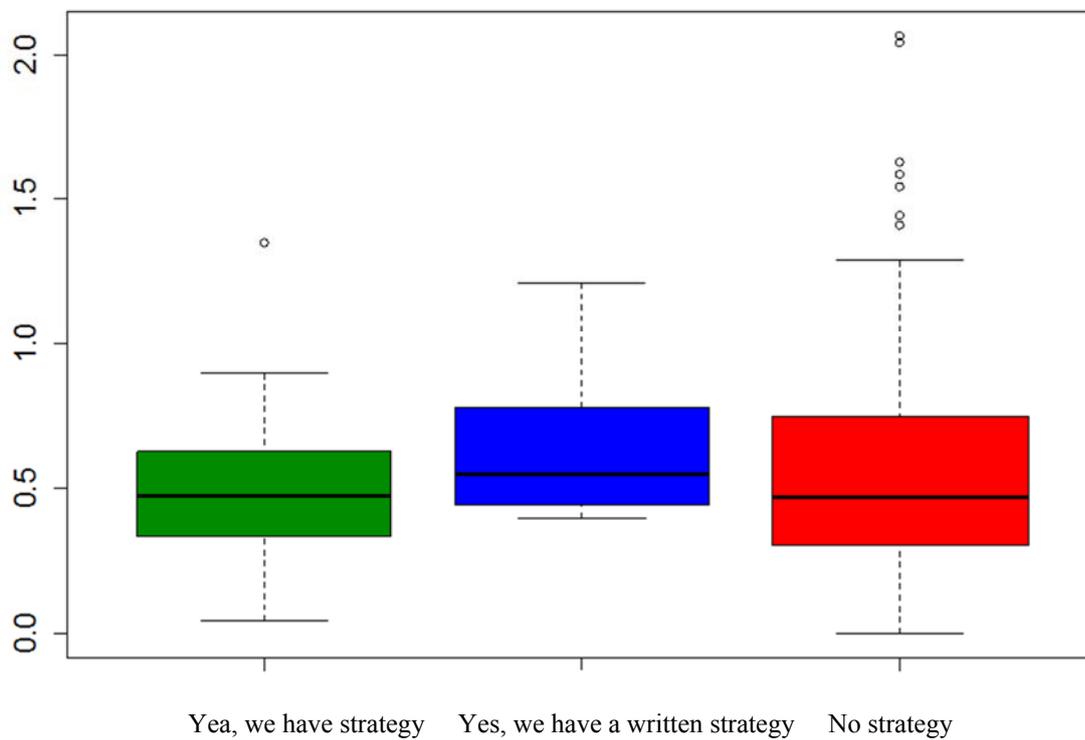
**Fig. 1: Relations between labour productivity (in th. of CZK) and monitoring of the objectives of the company (Weekly, Montly, Yearly, No control).**



Source: Own research.

## 2.2 Determine company's strategy.

Question of relation between the strategy and labour productivity was discussed. The research question was: "Does a determination of strategy impact on labour productivity in an enterprise?". Prior to testing the differences in productivity levels with regard to the method of formulating the strategy, normality of productivity was confirmed by Shapiro-Wilk test. A hypothesis "Writing the strategy affects productivity" was set. The result of the test rejected the null hypothesis, consistent with the normal distribution ( $p\text{-value} = 8,659 \cdot 10^{-9}$ ). With regard to this result, we used Kruskal-Wallis nonparametric test to test the hypothesis of conformity in "medium level of labour productivity in various defined strategies". The result of the test did not reject the null hypothesis about the same level of productivity in the existence of different formulations of strategies on human resources management ( $= 2.2746$ ;  $df = 3$ ;  $p\text{-value} = 0.5174$ ). For better clarity, Box-whiskers plots are used expressing productivity in million CZK depending on how strategies related to human resources management are formulated.

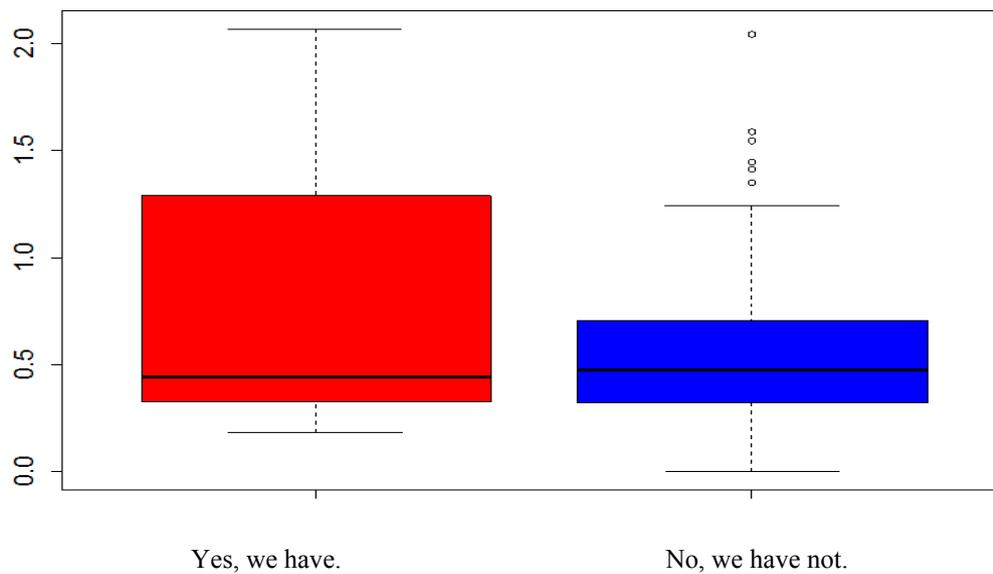
**Fig. 2: Relations between labour productivity (in mill. of CZK) and type of strategy.**


Source: Own research.

### 2.3 The existence of trade unions in the company.

In connection with testing the relation between labour productivity and the existence of trade unions in the corporate entity, we assume that the level of productivity is not affected by the existence of trade unions in the economic entity. In other words, the null hypothesis will assume the same high level of labour productivity, expressed in millions CZK, both in subjects with and without trade unions. Before testing the above-mentioned hypothesis, we performed the Shapiro-Wilk test of normality for both organizations with trade unions ( $W = 0.7788$ ,  $p\text{-value} = 0.008$ ) and without trade unions ( $W = 0.9108$ ,  $p\text{-value} = 7.296 \cdot 10^{-7}$ ). Given this significant result, it was necessary to test the same level of labour productivity using Mann-Whitney nonparametric test. For better quality, box-whiskers chart of labour productivity with respect to the existence of trade unions is used; see figure 3. The result of M-W nonparametric test was not significant ( $W=629$ ;  $p\text{-value}=0.8034$ ). It was not possible to prove that the labour productivity is different in enterprises with trade unions compared to enterprises without trade unions.

**Fig.3: Relation between labour productivity (in mill. of CZK) and trade unions.**

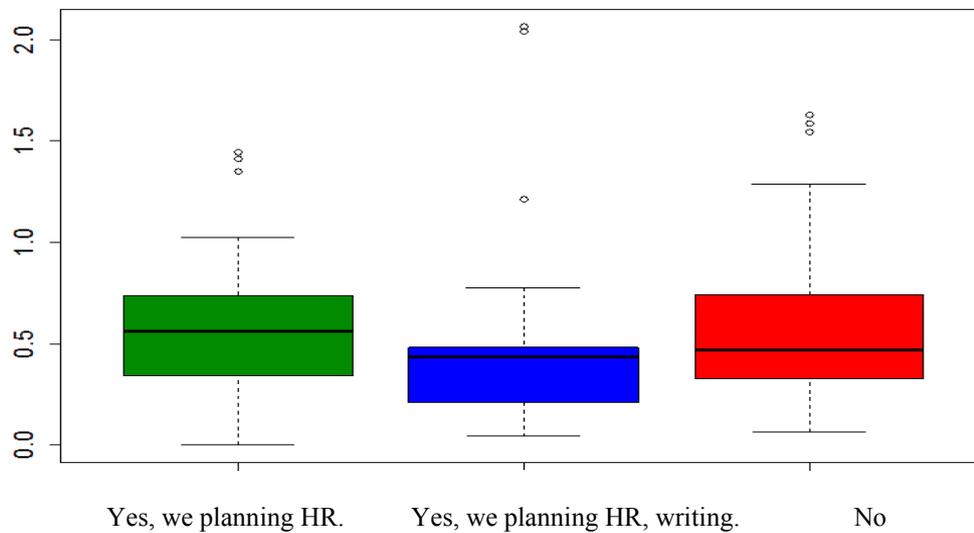


Source: Own research.

#### 2.4 Drawing up the plans of the number of employees.

At first, the hypothesis of normal distribution of the dependent variable "Labour productivity" was tested. The result of Shapiro-Wilk test rejected the null hypothesis that the planning of human resources in the enterprise has an impact on productivity. (Shapiro-Wilk test, p-value =  $8.659 \cdot 10^{-9}$ ). Due to this fact, the nonparametric Kruskal-Wallis test would be used. The result at the significance level did not reject the null hypothesis ( $= 2.0092$ ;  $df = 2$ ; p-value = 0.3662). It can therefore be reasonably assumed that in terms of labour productivity, there is no difference between whether an economic entity plans the headcount. So we can say that existing of plants of the number of employees do not influence the labour productivity.

**Fig.4: Relation between the human resource planning and labour productivity (in mill. of CZK).**



Source: Own research.

## Conclusion

This article focused to chosen factors of HR and their influences to the labour productivity. Our research was focused to a few of the factors. In this article are four of them mentioned: monitoring of the objectives of the company, determine company's strategy, the existence of trade unions in the company, drawing up the plans of the number of employees.

The above-mentioned relations and hypotheses revealed that monitoring is the most important, and only one which was statistical confirm like a factor which influent the labour productivity. The other factors – trade unions, human resource planning and strategy – we can not confirm by the statistic way that they influent the labour productivity as proved by the above mentioned methods. Our conclusion is support by Vrchota, Březinová (2014).

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## WHAT DRIVES STUDENT ENTREPRENEURS? GUESSS EVIDENCE FROM V4 COUNTRIES

Marian Holienka – Peter Gal – Zuzana Kovacicova

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### Abstract

**Purpose:** Student entrepreneurship is an important phenomenon within the entrepreneurial dynamics. At universities, students have access to broad knowledge and networks, and student status gives some freedom and space for experimenting before entering the “real” life with all its responsibilities. However, as in the general population, while some students get engaged in the enterprising efforts, the others remain distant. With business activities established already during the studies, the transition from student life to economic activity is smoother. Thus, our aim is to find out what drives student entrepreneurs in Visegrad countries in their business activities during their university studies.

**Design/methodology/approach:** Our analysis is built on data from Global University Entrepreneurial Spirit Students’ Survey (GUESSS), an extensive academic study on student entrepreneurship, collected in the 2016 wave. Our main sample comprises of 15,971 university students from V4 countries (Czech Republic, Hungary, Poland, Slovakia). Potential drivers from individual human and social capital characteristics, perceived institutional support, and demographic attributes are examined in our analysis, using the logistic regression method. We focus especially on promisingly sustainable student entrepreneurs with already active businesses who plan to continue them also after completing their studies.

**Findings:** Our findings indicate the main drivers leading university students to engage in entrepreneurial activity with perspective that exceeds the scope of student life. According to our results, gender (being a male) and increasing age play significant role, together with dropping number of years to finish studies. Intensity of entrepreneurship education and studying in a business-related field also positively affect inclination to running an own business. Finally, having enterprising parents significantly drives student entrepreneurship as well.

**Research/practical implications:** Based on the results of our analysis, we develop recommendation for policy makers and education programmers to utilize the entrepreneurial potential across universities in V4 countries and encourage more students to engage in sustainable business ventures. Universities should capitalize upon the existing generally established influences that also work for student population, but, at the same time, they need to target problematic issues (such as gender gap or business family gap) and develop focused and tailored actions to solve them through modified proven instruments.

**Originality/value:** Most studies take student entrepreneurs as a homogeneous group. However, according to empirical results only a half of them plan to continue with their businesses after completing their studies, while the others consider their enterprising as temporary or side activity. Therefore, we distinguish between the two, and focus our investigation only on student entrepreneurs declaring the long-term focus (i.e. active and prospective entrepreneurs), that implies a more promising future impact. With this unique perspective, we contribute to the existing body of knowledge on student entrepreneurship.

**Keywords:** entrepreneurship, university students, drivers, impact, GUESSS

**JEL Codes:** L26

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## **Introduction**

Student entrepreneurship is an important phenomenon within the overall entrepreneurial dynamics. University students benefit from access to broad knowledge and networks, and enjoy freedom and opportunities for learning and experimenting that will rarely repeat after entering the “real” life with all its duties and responsibilities. However, as in the general population, while some students get engaged in the enterprising efforts, the others remain distant. Providing that “more entrepreneurship” and “better entrepreneurship” is considered “good” for economy and society as such, encouraging students to enter the entrepreneurial path is especially important. If they establish business activities already during the studies, the transition from student life to economically self-sufficient activity of an entrepreneur is smoother. Also, individuals exploring the entrepreneurial career in the beginning of their economically active life are more likely to follow such direction also in the future professional life. Thus, student entrepreneurship deserves considerable attention.

Student entrepreneurs should not be considered as a homogeneous group. The reasons are twofold (as showed by GUESSSS 2016 data): considerable part of them are still in nascent stage without generating any revenues from their activity, and even among already active entrepreneurs, approximately half of them do not intend their current business activity to become their main occupation after completing university studies. Therefore, the presented paper narrows its focus to active and prospective student entrepreneurs, and examines the drivers of their involvement in business.

The main research question of our paper is to find out the drivers of student involvement in active and prospective entrepreneurial efforts during their university studies, in comparison to abstaining from entrepreneurship.

## **1 Student entrepreneurship and its drivers**

### **1.1 Student entrepreneurship in the context of nowadays universities**

The involvement of students in entrepreneurial efforts implied establishing the category of student entrepreneurs. According to Marchand and Hermens (2015), student entrepreneurs can be defined as individuals attending award classes at university and conducting innovative and revenue generating entrepreneurial activities. However, if we follow the broader understanding of entrepreneurship, this terms can be expanded to cover all students involved in actively running any enterprising activities, i.e. acting upon identified opportunities and developed

ideas, and transforming them into value for others. These entrepreneurial students take various advantages of university environment such as specialized professors, spaces and support services (e.g. incubators), patent and copyright protections and advisory provided by the university, and, last but not least, their classroom learning (Mars et al., 2008). In addition, they might also use universities and their faculty members or students to validate and market products and services. Within this context, nowadays universities have moved far beyond providing only courses on entrepreneurship, as this seems to be not enough anymore. The role of universities in stimulating entrepreneurship has to be understood in a broader context. Therefore, entrepreneurship has become, besides educating students and conducting research, something like their third mandate (Jansen et al., 2015). Within respect to students, according to Jansen et al. (2015), universities should encourage them through three groups of activities: stimulating (creating awareness of the entrepreneurial opportunities, presenting role models and success stories, etc.); educating (teaching the necessary skills, business plan creation, etc.); and incubating (various forms of support to start-up teams).

The nature of students' involvement in enterprising efforts is, however, rather diverse. As shown by some GUESSS national studies (Gubik and Farkas, 2016), some students establish enterprises with main motive to finance their studies and living expenses. Although students are formally engaged in different types of enterprises, they perform occasional activities (such as sales, financial advising, or artistic activities), or commission-based activities that are very similar to activities performed by employees, where the main difference usually is the flexible working hours enabling students to combine the work with their study. Therefore, it is expected (and also empirically shown by GUESSS data) that a considerable proportion of these type of student entrepreneurs would not continue in their businesses as the main economic activity after the completion of their studies. In our paper, we try to eliminate these "quasi-employees" and "temporary part-time entrepreneurs", and we focus on prospective active entrepreneurs who plan to keep the current activity as the main occupation also after finishing their studies.

## **1.2 Drivers of involvement in entrepreneurial activity**

The potential drivers of entrepreneurial activity among university students shall correspond to the generally valid drivers, while also considering the specifics of student status and university environment. Therefore, we searched for potential drivers within the following categories:

Individual human and social capital characteristics - within this category, participation in entrepreneurship education (as a human capital-related attribute) and having entrepreneur parents (social capital-related attribute) are concerned. Intensity of entrepreneurship education

shall contribute to increase of entrepreneurship-relevant human capital (e.g. by improving relevant skills and competencies, and ability to recognize and evaluate opportunities). Its positive effect on involvement in enterprising efforts has been suggested by several empirical studies (e.g. Menzies and Paradi, 2002). Having entrepreneur parents is a considerable component of an individual's social capital, as family is the closest and most important social group. Several authors (e.g. Lindquist et al., 2015) argue that parental entrepreneurship considerably increases likelihood of youth involvement in business activity, while the effect shall be contributed mainly to post-birth factors, especially parental role modelling and style.

Perceived institutional support - as our specific focus are university students, we will concern the supportive nature of university environment, especially by considering university pro-entrepreneurial atmosphere and effects of provided (not only business-focused) education on entrepreneurship-relevant attributes. Regarding the first, we expect the pro-entrepreneurial atmosphere to positively affect entrepreneurial inclination. As suggested by the study by Autio et al. (1997), the image of entrepreneurs and encouragement from university environment affect the entrepreneurial conviction of university students. Regarding the latter, increase in the skills and knowledge relevant to entrepreneurship resulting from educational process shall lead to increased entrepreneurial propensity, as belief in having skills, experience and knowledge has been broadly confirmed as significant driver of youth early-stage business (e.g. Holienka et al., 2016). According to study by Turker and Selcuk (2009), if a university provides adequate knowledge and inspiration for entrepreneurship, the possibility of choosing an entrepreneurial career might increase among young people.

Demographic attributes - within this category we consider generally established factors affecting involvement in entrepreneurship, such as gender and age, but we also expand our focus to attributes specific for university students, namely years to finish studies and field of study. As for gender, male generally exhibit higher entrepreneurial propensity within the overall population as well as among the youth (e.g. Holienka et al., 2016), being influenced by various gender-related attributes, such as opportunity perception and self-confidence to name some (Langowitz and Minniti, 2007). Increase in age is generally linked with increasing human and social capital - factors that positively influence tendency to start business activities. Empirical findings suggest that among young population, involvement in entrepreneurship increases with age (Lukes and Zouhar, 2013), so the similar pattern should be expected within student population. As for years to finish university, increased interest in entering the economically active life would be expected as approaching the end of studies. As one of the options is self-employment through starting an own business, increased involvement of students closer to

completing their studies shall be expected, compared to their more recently enrolled counterparts. Finally, as far as the field of study is concerned in relation to entrepreneurial activity, higher involvement of business students would be expected due to generally expected higher intensity of entrepreneurial education (resulting to increased skills, knowledge and related self-efficacy), as well as due to study field selection bias (where students interested in entrepreneurship are supposed to have increased interest in business education). On the other hand, non-business students often have advantage based on being equipped with certain marketable professional domain or skill (e.g. informatics, engineering, design etc.), unlike business students, which gives them a good basis to turn these assets into viable business.

## **2 Material and methods**

Our analysis was based on 2016 Global University Entrepreneurial Spirit Students' Survey (GUESSS) data for Visegrad (V4) countries - Czech Republic, Hungary, Poland and Slovakia. GUESSS is a worldwide survey on entrepreneurial attitudes, plans, activities and aspirations of university students, collecting primary data through own survey instrument. The 2016 overall sample comprised of 122,000+ university students from 50 countries worldwide. The data was gathered using an online questionnaire following the convenience sampling approach, with being an active higher education student as the only selection criteria. In accordance with the aim of our analysis we geographically limited the sample to V4 countries, resulting into the main research sample consisting of total 15,971 individuals.

Our dependent variable indicates involvement in active and prospective enterprise (1=already running own business or being self-employed, and planning that business to become the main occupation after graduation; 0=not running or trying to start own business, not self-employed or trying to become self-employed). Our main research sample contained 436 active and prospective entrepreneurs (2.73%) and 11,712 (73.3%) non-entrepreneurs.

The explanatory variables included in our analysis can be grouped into three categories. First, demographic attributes included gender (0=female, 1=male), age, years to finish studies (0, 1, 2, 3 and more years), field of study (business=1, non-business=0). Second, individual human and social capital characteristics included entrepreneurship education intensity (1=no course, 2=voluntary course, 3=obligatory course, 4=special program), and having parent entrepreneurs (0=none, 1=one of parents, 2=both parents). Third, variables assessing the perceived institutional support included university atmosphere (3-items, 1-7 Likert-type scale), and perceived effect of received education on entrepreneurial qualities (5-items, 1-7 Likert-type scale). Furthermore, we included the country dummy to control for country differences.

To examine the influence of the analyzed variables on our dependent variable we employed a binomial logistic regression analysis. We have estimated a set of logistic regressions with a binomial dependent variable – odds of being involved in active and prospective entrepreneurship. To estimate the parameters of the models we used IBM SPSS Statistics 24 software. The significance of parameters was tested using Wald z-statistics. Maximum likelihood estimations were used to calculate the logit coefficients denoting changes in the log odds of the dependent variable.

### **3 Results and discussion**

The results of binomial logistic regression conducted to identify factors influencing students' involvement in active and prospective entrepreneurial activity are presented in Table 1.

As can be seen from Tab. 1, six explanatory variables proved significance in relation to students' involvement in active and prospective entrepreneurship. The highest explanatory power was observed in case of gender, where being a male increases the odds of being an entrepreneur by more than three times. The second highest explanatory power was observed in case of having entrepreneur parents, where increase in parents' involvement intensity (i.e. one vs. none, both vs. only one) doubles the odds of active and prospective involvement in business. Odds of becoming an active and prospective entrepreneur also increase with increasing intensity of entrepreneurship education, as well as with age of an individual. The first model also estimated significance of number of years to finish studies (with slightly increasing odds of involvement in business with approaching end of the studies), as well as the field of study (with higher odds for business students) (in the remaining two models these variables were still significant at 0.1 interval). As for country variable, compared to base category (i.e. Slovakia), odds of involvement in active and prospective business are significantly lower for Hungarian and Polish students, while Czech students show no significant difference.

**Tab. 1: Active and prospective entrepreneurship drivers (logistic regression results)**

Variable	Mod 1		Mod 2		Mod 3	
	B (S.E.)	OR	B (S.E.)	OR	B (S.E.)	OR
Constant	-4.731*** (.193)	.009	-8.543*** (.371)	.000	-8.440*** (.384)	.000
Gender	1.132*** (.107)	3.103	1,141*** (.111)	3,131	1,149*** (.113)	3,154
Age	.949*** (.070)	2.583	,175*** (.011)	1,191	,177*** (.011)	1,193
Years to finish	-.123** (.052)	.885	-,092* (.054)	,912	-,097* (.055)	,908
Field of study	.435*** (.108)	1.545	,206* (.121)	1,228	,226* (.124)	1,254
EE intensity			,237*** (.056)	1,268	,241*** (.058)	1,273
Parents entrepreneurs			,765*** (.071)	2,149	,751*** (.072)	2,120
University atmosphere					,010 (.053)	1,010
EE effects					-,048 (.056)	,953
Slovakia						
Hungary	-.931*** (.140)	.394	-,975*** (.147)	,377	-,981*** (.149)	,375
Poland	-.629*** (.136)	.533	-,723*** (.144)	,485	-,719*** (.147)	,487
Czech Republic	-.174 (.182)	.840	-,158 (.190)	,854	-,135 (.193)	,874
Observations	11265		11096		10879	
R2	.122		.170		.170	
-2 Log likelihood	3069.544		2807.777		2745.003	

Source: own calculations based on GUESS data

Our findings suggest that gender, a characteristic that works well as a driver of business activity in general for youth populations (e.g. Holienka et al., 2016), was found to be significant also within the population of V4 university students. It seems that university environment does not eliminate the gender bias of entrepreneurial activity. Thus, universities are not helping to improve the overall insufficient inclusivity of females in entrepreneurship typical for our region (e.g. Pilkova et al., 2016). Therefore, specific initiatives have to be developed and implemented to encourage and support more female students in their entrepreneurial activities.

As for age and years to finish study, both attributes indicate individual maturity and proximity to real life after completion of studies. There, one has to become economically active, with one of the options being the economic self-sufficiency via entrepreneurship. As students

get older or come closer to graduation, they start their professional careers, and part of them enters the entrepreneurial path. Thus, proximity of the real life might be the triggering event for those who have been considering entrepreneurship, but have not taken any concrete steps, yet.

Our findings also indicate that besides generally valid drivers, universities' effect on entrepreneurship-relevant individual human capital play also significant role. Increased intensity of entrepreneurial education together with attending business-related field of study is associated with increased involvement of students in entrepreneurial activities. However, understanding the causality of this relation would require further investigation. In fact, both direction would make sense - students can either do business because they were taught and motivated to do so, or they might have selected business studies due to interest in doing business, that also lead them to start one alongside their studies.

Having entrepreneur parents, being a generally well-established driver, works also in student population in our region. Also, intensity of family involvement matters, as odds increase with both parents involved in entrepreneurship. We may argue that parental role models positively affect entrepreneurial appetite in two possible ways - through providing positive attitude, and through enabling to naturally gather business-relevant skills. However, absence of entrepreneurial family background implies limited social and professional mobility. Thus, effective mechanisms should be developed to (partially) replace the positive effect of parents-entrepreneurs among students from non-entrepreneur families.

To our surprise, we did not find any significance in relationship between perceived institutional support (i.e. university atmosphere and perceived effect of received education on entrepreneurial qualities) and students' involvement in active and prospective business. Thus, it seems that supportive environment itself is not a sufficient driver. Besides creating favorable entrepreneurial climate, key attention should be aimed at individual-level actions.

Our analysis also identified significance when controlling for country effects. Students in Poland and Hungary show lower odds of active and prospective entrepreneurship compared to Slovakia (reference category). This pattern originates in their lower inclusion in active entrepreneurship and lower percentage of entrepreneurs expecting business lifespan exceeding the university studies. Separate country models that were estimated, however, show great similarity in terms of drivers (both in their strength and structure) among V4 countries.

## **Conclusion**

To conclude, our analysis of drivers related to students' involvement in active and prospective entrepreneurship during their university studies unveiled that while university

certainly influence matters, general drivers work to great extent for student populations. Effects of university environment and entrepreneurship focus, however, seems not being able to brake the traditional influence of well-established factors. Also, we observed that students became more decided to take the concrete action and start a business as they approach the end of their studies. Therefore, in our opinion, universities should capitalize upon the existing general effects, but at the same time they need to target problematic issues (such as gender gap or business family gap) and develop actions to solve them through well-established instruments (e.g. intensity of entrepreneurial education) focused and tailored to particular target groups.

### **Acknowledgment**

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## UTILIZATION OF FINANCIAL SUPPORT PROGRAMS BY SLOVAK ENTERPRISES

Lenka Hvolková - Vladimíra Klementová

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### Abstract

**Purpose:** Small and medium-sized enterprises are in general facing a wide range of barriers and one of the most important barrier for their development is a lack of money. Therefore, the governments usually create a collection of support programs that help companies to eliminate these obstacles. The main aim of the paper is to evaluate how Slovak SMEs utilize support programs of the Slovak government and European Union in their business activities. On the base of the findings the paper will also contain suggestions how this type of support can become more available for Slovak companies in future.

**Design/methodology/approach:** The main objective of the paper is achieved through the empirical research performed in 2016 on the sample of Slovak companies via electronic questionnaire. We have distributed questionnaires to the 2 500 potential respondents, the rate of return was 3,2 %. We have formulated two hypotheses, the first one defined an assumption that Slovak micro enterprises were mostly interested in obtaining grant for self-employed person. The hypothesis H2 was based on the premise that the bureaucracy and administrative burden are the strongest barriers in applying for financial support programs.

**Findings:** The paper brings empirical findings about how the Slovak enterprises perceive the financial support programs provided by the state institutions and institutions from European Union; it also identifies main obstacles for obtaining of this type of financial resources.

**Research/practical implications:** The study includes implications for the improvement of the state system that is supporting Slovak companies. It also analyses current activities of the public sector, e. g. the existence of Better Regulation Centre and National Business Centre. In future it is necessary to extend the existing research in the number of respondents and also deeper insights into specific support programs.

**Originality/value:** This study contains feedback from enterprises, i. e. recipients of the support programs that bring important information for the state institutions and European institutions in order to provide more effective support in future.

**Keywords:** Entrepreneurship, Small and Medium-Sized Enterprises, State support, Support programs

**JEL Codes:** L26, M20, O10

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## **Introduction**

The role of small and medium sized enterprises (SMEs) in national economies has many dimensions. Firstly, the SME sector comprises the vast majority of companies in many economies in terms of absolute numbers. A more proportionate measure of the contribution of the sector to the macroeconomy may be gained by examination of numbers employed, output, or Gross Value Added (Bhaird, 2010; Hallberg, 2000). The SME sector is also important in terms of innovation and regional development, a contribution that is more difficult to quantify (Klement, 2015). The available literature suggests a strong link between the availability of finance and SME growth, and this has led to the notion of a “finance gap” (Becchetti, Trovato, 2002). Given that SMEs are responsible for significant levels of employment, innovation and productivity (Kormancová, Kovaľová, 2011), it is important that policy makers and advisers are well-informed about the determinants of SMEs` growth, including the various demand-side issues surrounding the provision of growth funding for this sector.

Veber et al. (2012) define the support for SMEs on the base of the subject that provides the support – according to this approach we recognize support provided by the government institutions, business incubators and other institutions (established in form of partnership of private and public sector), non-profit organizations and commercial subjects. The support system of SMEs in the Slovak Republic is nowadays complicated because of the large number of supporting institutions that usually have complicated connections (Marková, 2003). Based on this information we wanted to find out which support programs are interesting for Slovak enterprises and which barriers demotivate them in applying for these programs. The following hypotheses will be verified in this article:

**H1:** Micro enterprises are mostly interested in grant for self-employed person when applying for financial support.

**H2:** The strongest barrier in applying for financial support programs is bureaucracy and administrative burden.

## **1 Methodology of empirical research**

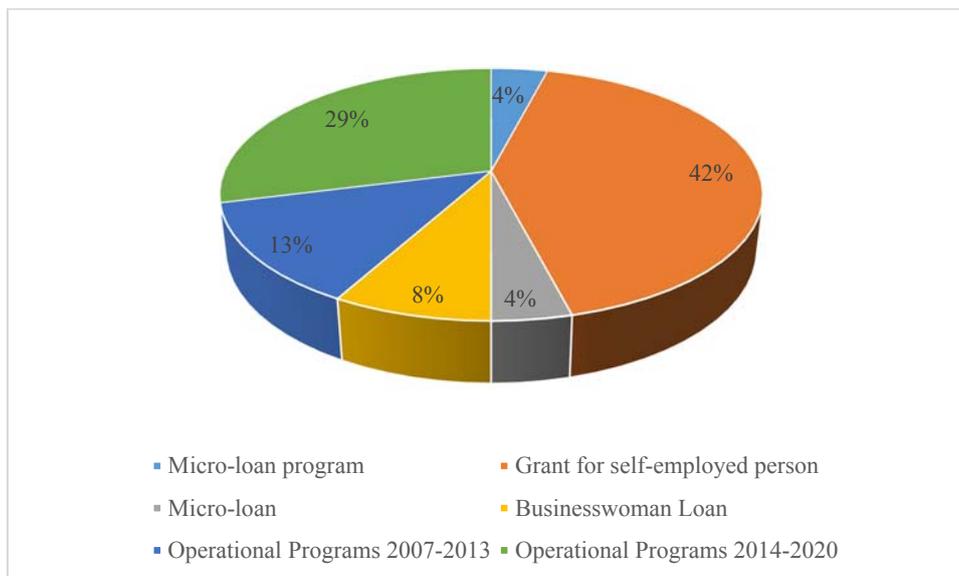
The aim of empirical research was to identify the extent to which Slovak SMEs use the support programs provided by Slovak government and European Union institutions to develop their activities. Researched subjects were SMEs with diverse line of business operating all over Slovakia, while the objects of research were selected support programs aimed at businesses and intensity of fundraising.

The primary data have been collected by query method, specifically by means of electronic questionnaires available at Google Docs. The questions in the questionnaire investigated the forms of support applied for by enterprises, problems in application for support as well as success rate. On the other hand, enterprises not applying for support were questioned about the barriers discouraging them from drawing the funds. There were 2 500 questionnaires distributed to potential respondents from which 80 returned back in the correct form (rate of return was 3,2 %). The majority of respondents were micro enterprises (94 %), the rest of the sample was made up of small (5 %) and middle-sized (1 %) enterprises. All Slovak regions were represented in the sample and examined enterprises have operated in various sectors of the economy. Most enterprises (91 %) have possessed only domestic capital. The primary data obtained by means of questionnaires have been processed and analysed using mathematical and statistical methods. The hypotheses have been verified on statistical basis ( $\alpha = 0,05$ ). We have also verified the representativeness of the sample with the Chi-square test, the test criterion was the size category of enterprises. According to the results we can confirm that the sample was representative (Chi-square test p-value 0,015). The synthesis of research outcomes and findings enabled formulation of recommendations oriented on increased availability and effective using of support programs.

## **2 Interpretation of results**

### **2.1 Utilization of the support programs**

For the purpose of identification of the most common financial support programs we have prepared a range of selected programs representing the national and also international level of support. Selected programs could be also divided into two different categories – refundable (e. g. loans) and non-refundable (e. g. grants and contributions). National support was represented by the Micro-loan program (offered by the Slovak Business Agency and Ministry of Economy), Micro-loan, Young Enterprise Credit and Businesswoman Loan (offered by the Slovak Guarantee and Development Bank) and Grant for self-employed person (offered by the Ministry of Labour, Social Affairs and Family). National support programs were supplemented by the selected programs of European Union – JEREMIE Initiative, COSME, Horizon 2020, Operational programs 2007-2013 and Operational programs 2014-2020. Figure 1 shows the percentage of support programs that Slovak enterprises applied for in last eight years.

**Fig. 1: Application for financial support programs**


Source: Empirical research

Primary results prove that Slovak enterprises prioritize non-refundable financial help mostly in form of contributions or grants. More than 40 % of the respondents applied for the grant for self-employed person, another important potential source of financing were Operational programs of the European Union from the previous programming period. Strong preference for non-refundable financial support was also proved by another question considering future application for financial support. Almost 95 % of the respondents confirmed that they will favour this type of support over refundable help. Success rate of applications is also an important criterion; according to the results of the empirical research we can confirm that the rate of success was 90 %. Another interesting fact is that enterprises from the East of Slovakia that had lower awareness about support programs and institutions, had 100 % success rate in application for support.

According to the results of the questionnaire research of the Slovak Business Agency (2016) that has cooperated with the 1 011 respondents, only 16 % of them have utilized financial support programs in last two years. The most frequent used programs were Operational Programs of European Union (44 %) and grants from the state budget (41 %).

Hypothesis H1 defined an assumption that Slovak micro enterprises were mostly interested in obtaining grant for self-employed person. This premise is based on the fact that this type of support is used for individual entrepreneurs (94 % of the respondents were micro enterprises), requires only minimum of administration and is formed as a non-refundable program. For the verification of this hypothesis was used Cochran Test and McNemar Test, p-

values of these tests (Cochran Test p-value 0,000, McNemar Test p-value 0,019) proved that we support hypothesis H1 (tab. 1).

**Tab. 1: Test Statistics – Cochran Test and McNemar Test**

Test Statistics														
N		75												
Cochran's Q		67,769 <sup>a</sup>												
Df		9												
Asymp. Sig.		,000												
Monte Carlo Sig.	Sig.	,000 <sup>b</sup>												
	99% Confidence Interval	Lower Bound	,000											
		Upper Bound	,000											
a. 0 is treated as a success.														
b. Based on 10000 sampled tables with starting seed 299883525.														
<p><b>McNemar Test</b></p> <p><b>Crosstabs</b></p> <p><b>Grant for self-employed person &amp; Operational Programs 2007-2013</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Grant for self-employed person</th> <th colspan="2">Operational Programs 2007-2013</th> </tr> <tr> <th>0</th> <th>1</th> </tr> </thead> <tbody> <tr> <td>0</td> <td style="text-align: center;">63</td> <td style="text-align: center;">2</td> </tr> <tr> <td>1</td> <td style="text-align: center;">10</td> <td style="text-align: center;">0</td> </tr> </tbody> </table>				Grant for self-employed person	Operational Programs 2007-2013		0	1	0	63	2	1	10	0
Grant for self-employed person	Operational Programs 2007-2013													
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<p><b>Test Statistics<sup>c</sup></b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>q4 2 &amp; q4 10</th> </tr> </thead> <tbody> <tr> <td>N</td> <td style="text-align: center;">75</td> </tr> <tr> <td>Exact Sig. (2-tailed)</td> <td style="text-align: center;">,039<sup>a,b</sup></td> </tr> <tr> <td>Exact Sig. (1-tailed)</td> <td style="text-align: center;">,019<sup>a</sup></td> </tr> <tr> <td>Point Probability</td> <td style="text-align: center;">,016<sup>a</sup></td> </tr> </tbody> </table>					q4 2 & q4 10	N	75	Exact Sig. (2-tailed)	,039 <sup>a,b</sup>	Exact Sig. (1-tailed)	,019 <sup>a</sup>	Point Probability	,016 <sup>a</sup>	
	q4 2 & q4 10													
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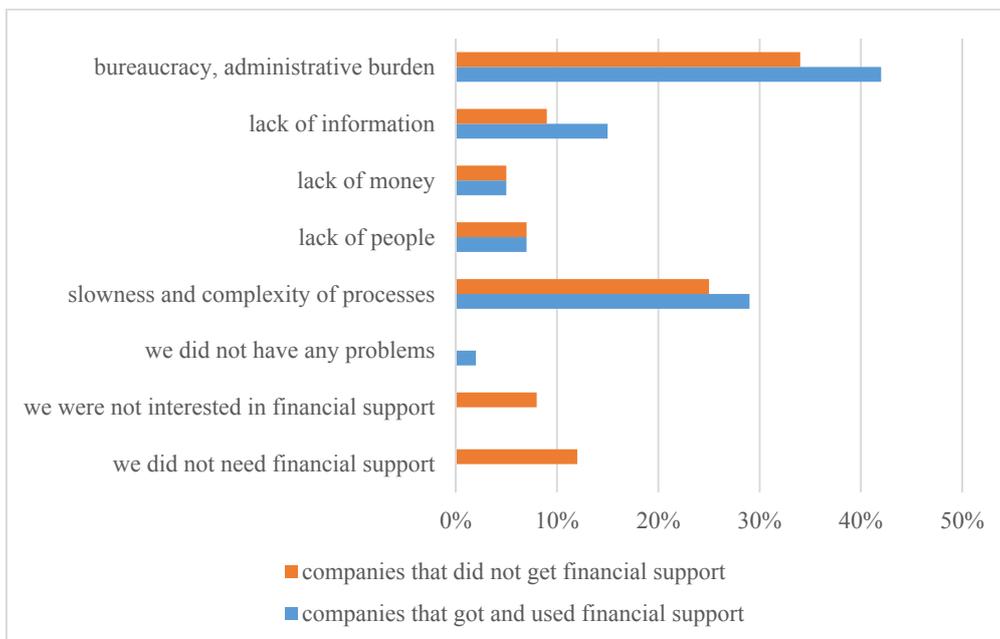
Source: Empirical Research, SPSS Statistics

## 2.2 Barriers to obtaining resources from financial support programs

The content of the questionnaire research was also oriented on the identification of barriers and obstacles perceived in the field of financial support programs. Existing research shows that

among the factors that discourage companies and entrepreneurs from applying for support programs can be included mostly administrative difficulty, low awareness and lack of information about programs, lack of resources (e. g. money or people that would prepare the application and manage the whole process of financing) or long and difficult processes of financing (Slovak Business Agency, 2016). In the questionnaire companies that applied for support programs had to identify factors that complicated the process of preparing the application and the financing itself. On the other hand, we have also obtained information from the companies that did not use this type of financing – they had to identify most important factors that prevented them from applying for support. Next figure shows the most important barriers for both groups of respondents.

**Fig. 2: Barriers and obstacles of application for financial support programs**



Source: Empirical research

When identifying factors preventing utilization of support programs there is no significant difference between the enterprises that have applied for support and those who have not. Enterprises consider the most important barrier fact that support programs require usually a lot of reporting and administration (42 % of enterprises that have applied for funding or 34 % of enterprises that have not). Both groups of respondents agreed also on the identification of the second most important barrier – slowness and complexity of processes of fundraising (29 % or 25 %), respondents also expressed their opinion on the insufficient amount of information about support programs (15 % or 9 %). There is still a part of enterprises among the second group of

respondents that did not need financial support or were not interested in support programs (together 20 %). These results were also confirmed by the questionnaire research of the Slovak Business Agency (2016). Almost 75 % from the total number of 1 011 respondents consider for the most important barrier administrative burdens. Except the recommendations about the reduction of these burdens the respondents suggested also to increase the information about the financial support programs (37 %) or reduction of the evaluation process of the applicants (30 %).

In the second hypothesis H2 there has been an assumption about the strongest barrier of applying for financial support programs. This hypothesis was based on the premise that the process of application for support includes a number of administrative actions, usually it also means to prepare detailed project. As in the previous hypothesis also here we have used the Cochran Test and McNemar Test for verification. Based on the p-values of these tests (Cochran Test 0,000, McNemar Test 0,109) we can also support H2.

**Tab. 2: Test Statistics – Cochran Test and McNemar Test**

<b>Test Statistics</b>			
N		20	
Cochran's Q		41,763 <sup>a</sup>	
df		5	
Asymp. Sig.		,000	
Monte Carlo Sig.	Sig.		,000 <sup>b</sup>
	99% Confidence Interval	Lower Bound	,000
		Upper Bound	,000
a. 1 is treated as a success.			
b. Based on 10000 sampled tables with starting seed 1314643744.			
<b>McNemar Test</b>			
<b>Test Statistics<sup>c</sup></b>			
	Bureaucracy, administrative burden & slowness and complexity of processes		
N	20		
Exact Sig. (2-tailed)	,219 <sup>a</sup> ,b		
Exact Sig. (1-tailed)	,109 <sup>a</sup>		
Point Probability	,094 <sup>a</sup>		

- a. Exact results are provided instead of Monte Carlo for this test.
- b. Binomial distribution used.
- c. McNemar Test

**Test Statistics<sup>c</sup>**

	Lack of information & slowness and complexity of processes
N	20
Exact Sig. (2-tailed)	,070 <sup>a,b</sup>
Exact Sig. (1-tailed)	,035 <sup>a</sup>
Point Probability	,031 <sup>a</sup>

- a. Exact results are provided instead of Monte Carlo for this test.
- b. Binomial distribution used.
- c. McNemar Test

Source: Empirical research

## Conclusion

Economy of the Slovak Republic is characteristic with the fragmentation and unsuitable coordination of the programs aimed at the support of small and medium sized enterprises. The main purpose of empirical research was to identify the extent to which Slovak SMEs use the support programs provided by Slovak government and European Union institutions. In the article we have presented part of the information obtained by query method – we focused on the types of support programs that the respondents applied for, programs that they have utilized and problems connected with the application and also drawing the funds. The results of the empirical research were confirmed by other researches (Slovak Business Agency, 2016; GEM, 2015; European Commission, 2012) – they have also acknowledged that Slovak enterprises prefer mostly non-refundable programs and discouragement lies mostly in administrative burdens and low level of information.

Nowadays, a large number of activities is already performed and also planned in order to improve the existing situation in this field. The aim to reduce the disproportionate regulatory burden on businesses (also in the state support programs) together with the improvement of the business environment in the Slovak Republic fulfils Better Regulation Centre. This institution also manages the specific needs of small and medium sized enterprises and helps to simplify the existing regulations on the market for them. The National Business Centre was established in 2015 as an interface among the business sector, research and development sector and academia (National Business Centre, 2015). This centre provides information about financial

support programs for beginners, established entrepreneurs and innovative enterprises. However, the entrepreneurs will not find comprehensive funding possibilities and there is also absence of comparison of selected programs. The next step of the National Business Centre Project focuses on establishment of other offices in the Slovak Republic with the goal of spreading support in all regions. The preference of the respondents for the non-refundable financial support programs is obvious according to the results of the research. Our recommendation is to increase a share of the refundable programs (in the form of e. g. loans with lower interest rates, bank guarantees for loans and venture capital). These instruments will motivate the enterprises to stronger discipline, force them to spend the money more effectively and focus on the long-term return of invested financial resources.

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## APPLICATION OF MYSTERY CALLING METHOD IN CAR DEALERSHIPS – POLISH-CZECH RESEARCH

Katarzyna Hys – Liliana Hawrysz – Roman Kozel – Šárka Vilamová

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### Abstract

**Purpose:** The objective of this article is to present research results assessing standards of the telephone service carried out by employees of car dealerships.

**Methodology:** The research was conducted based on a developed conceptual model which was empirically verified by Mystery Calling method. In order to obtain results of this measurement, the original interview questionnaire was elaborated.

**Findings:** It was established that although customers recognize the areas for improvement, general standards of customer service have been assessed positively.

**Practical implications:** Although the study has been carried out on a selected cohort of respondents, it was observed that the obtained results might have implications for the whole automotive industry. Results have indicated the need to strengthen employees from the mental and professional side. Further empirical studies should be carried out for a larger sample of companies. The model and methods are universal and can be adapted to evaluate other services.

**Originality/value:** This research sheds light on the research gaps regarding the evaluation standards of call service by the customer of the car dealerships. The originality of the research consists in implementing it in two European countries. Moreover, specific research tools were developed taking into account requirements of the testing environment. Due to deliberative actions, results have comparative and utilitarian value.

**Keywords:** Telephone Customer Service Standard, Car Dealerships, Mystery Calling, Blueprinting

**JEL Codes:** M3; M30; M31

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## **Introduction**

Due to the fact that quality has become one of the most important (beside the price) customers' selection criteria of the product, we can observe an increased effort of both researchers and practitioners in the process of creating this quality. Consumer society has a demand for services that will meet the expectations expressed or anticipated by customers. Hunt (1993) stated that the companies that are incapable to offer high quality services, will eventually lose their competitiveness. Nowadays, entrepreneurs in order to maintain proper level of competitiveness of their companies on the market have to pursue high quality in all aspects of operation. This is particularly significant in the light of Eurostat Report 2014, report results indicate that for all European Union members 60-75% of the total economic output derives from the provision of services (Eurostat, 2014). In conditions of the global trade, and consequently ceaseless competition, entrepreneurs have to acquire advantages of their competitiveness. Improvement of quality is one of the most important success factors for the company (Gittins, 2007).

## **1 Background**

The definition of quality of service is providing scientists with many problems. The reason for this state are the characteristics of service such as intangibility, impermanence, diversity, inseparability of services with a contractor, the inseparability of the processes of production and consumption and impossibility of acquisition of ownership rights. However, it is assumed that quality of service is needed to create customer satisfaction and that it is an integral part of customers' perception and their expectations. Parasuraman, Zeithaml and Berry (1985) stated that quality of service can be described as the result of comparing "customers perceptions" and "expectations" in relation to the service they will use (or have already benefited from). This means that if evaluation of service realized by the customer is greater than the expectations of service, it will be a positive situation. And vice versa. If the perception of the customer in terms of service is lower than expectations it will mean a negative situation.

A positive situation is acknowledging by the customer that the service is fulfilling standards of the quality. However, a negative situation means that these standards were not met. This situation can cause loss of customers, which in the long perspective means closing the business. Oliver (1997) claims that customer satisfaction or lack thereof may be a crucial decision for the company, because it can constitute its staying on the market or the liquidation. In contrast, Gibson (2005) reminds that satisfied customers become loyal customers which means that they can become consciously or unconsciously ambassadors of the product and

service. Quality of service in companies providing services is a key factor for their success. For years, studies have been conducted on the definition of service quality, dimensions of services, measurement and assessment of quality of services, visualization of services, and introduction of improvement activities aimed at gaining competitive position on the market. Hys (2014) points out that quality is a temporary assessment, that can change over time. It means that quality is a conceptual continuum (it has no beginning and no end), which interpretation depends on the perceptive abilities of people and at the same time every opinion is conditioned by spatiotemporal, economic, aesthetic, technical and utility factors that make up the features and characteristic group of quality enabling its evaluation.

In consequence, quality rating may have evaluative or descriptive nature (Hys, 2015). Quality in terms of dimensions is postulated by researchers such as Grönroos (1983), Lehtinen and Lehtinen (1982), and Parasuraman, Zeithaml and Berry (1985). They all claim that quality in order to be assessed, in the first place must be defined. Due to the leading feature of quality of service, which is immateriality, there is a great difficulty in its measurement. Consequently, these authors proposed Gaps Model by using which they designated specific dimensions of assessment of service quality. These are reliability, assurance, tangibles, empathy and responsiveness (Parasuraman and Zeithaml, 2006). Gaps Model has also become the basis for development of leading methods of measuring the quality of services - SERVQUAL. Nowadays, this method is quite extensively used in both theory and practice. Another way to measure quality of service is Mystery Shopping method. The idea of this method is to measure quality of service - including customer service standards - using hired people pretending to be real customers (Hys et al., 2015).

A variant of Mystery Shopping method is Mystery Calling. Here, observation and evaluation of employees occurs during a telephone call. A customer's first contact with a company may be made through a telephone call. The way in which a potential customer is being addressed may determine his or her final view on a company. Therefore, it is important to design standards of telephone customer service to meet customers' expectations. At the same time through contact solely by telephone, it is vital to use opportunities to convince the customer to benefit from company offer. Authors of the article believe that even during a telephone call, non-verbal communication may affect the overall perception of quality, e.g. awkward moments of silence during a conversation over the telephone. Schneider and Bowen (1985) and Tornow and Wiley (1991) indicated a positive correlation between the employees' attitude and customers attitude towards perception of service quality by customers. They also discovered that customer satisfaction is directly related to attitudes and perceptions of company employees.

In turn, attitude and perception of employees relate to the organization and its management practices. Hys drew attention to the need for undertaking multidimensional evaluation of quality of services. Hence, SERVQUAL method was used in modified form in order to assess quality of service from the perspective of customers and employees. It seems that comparing these two perspectives gives a better image of organization reality than measuring only the customer sphere (Hys, 2009).

## **2 Research Metodology**

This article is one in the series of articles, in which authors present tests results carried out mainly using the method of Mystery Calling. The article presents tests results of carried out using the method of Mystery Calling, taking into account the working conditions and work environment in Skoda dealership, both in Poland and in the Czech Republic. In order to obtain results of this measurement the original interview questionnaire was elaborated. In the course of the research, 180 interviews were conducted according to a scenario in 60 Skoda dealerships.

## **3 Results and disscutions**

### **3.1 Mystery Calling Interviews**

180 test calls were performed. A team of researchers conducted all test calls. Authors of this article trained researchers and during the research, they all used the same questionnaire. In order to validate the questionnaire, 20 pre-test calls were performed. During pre-tests, changes needed to be implemented into the questionnaire have been identified and a test procedure was developed. As a result, questionnaire form was modified, necessary changes were introduced, and thus universal questionnaire was developed. During the pre-tests, it was essential to acquire a certain routine and experience in order not to differ from the typical customer. Authors believe that pre-test stage was of key importance to the success of the research.

### **3.2 Scenario**

Conversation scenario was following: the mystery customer called three times one shop, using contact number posted on the website of the car dealership. The customer asked questions about the offer of the car dealership for three different situations:

1. Purchase a new urban and economic car (Fabia). The mystery customer pretended to be uninformed in the current offer of the car dealership. He indicated the intention to buy a car and asked for help in finding the right model.

2. Purchase a new family car (Octavia, Rapid). The mystery customer was a young person who tried to get information about promotions and the possibility of buying a car.
3. Purchase a new big car (Superb) in exchange for handling old car of a medium size. The customer was not very talkative; he changed his mind during a conversation - was undecided, and several times asked the same thing.

### **3.3 Sample**

The research was conducted in 60 Skoda dealerships, from June to October 2014 in Poland and in the Czech Republic. During the research, 180 interviews were performed according to previously developed scenario. The sample used in the research comprised of 60 random employees who answered the mystery calls concerning the real cases scenarios. They were rated according to the same questionnaire. The data were analyzed using SPSS program.

## **4 Conceptual development - Mystery Calling**

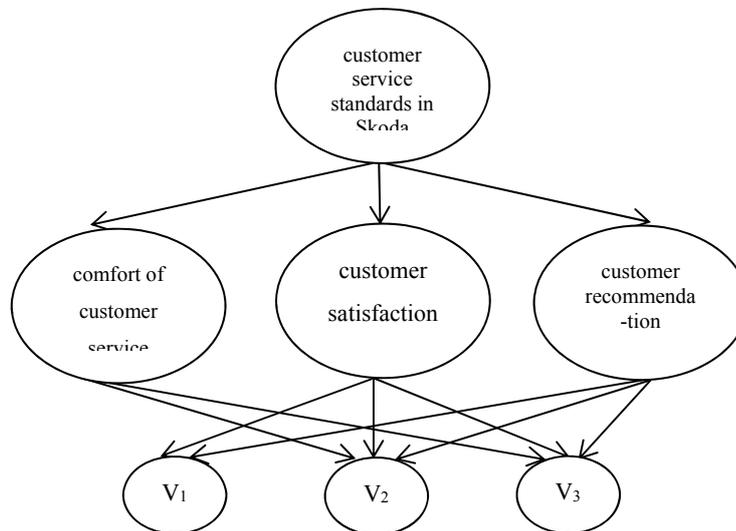
As a result of visualization process of telephone service a questionnaire was prepared, which was used by researchers in Mystery Calling. Mystery Calling is a market research tool for objective measurement of service quality through a telephone call by both the customer and the employee. The customer gets the basic information about the offer or customer is redirected to the proper employee. Whereas, the employee during the telephone call, can prepare a customer profile. The advantage of a given method is that callers have a common interest resulting from the conversation; therefore, they are open to the exchanging and acquiring information. They do not treat the conversation as irritating typical call center services. The questionnaire included four sections:

1. Section A: First customer contact with the employee - evaluation of physical evidence. In this case, following issues were assessed:
  - up to date contact information (current phone number)
  - waiting time for connection with the employee so called reaction time,
  - employee's personal characteristics (communicativeness, politeness, commitment, accuracy of information provided).
2. Section B: A conversation with a sales specialist.
3. Section C: Sales ability/advisory services.
4. Section D: Recommendations.

#### 4.1 Model

As a result of our theoretical studies, a conceptual model has been defined (Figure 1).

**Fig. 1: The conceptual model for assessing standards of customer service in the car dealership**



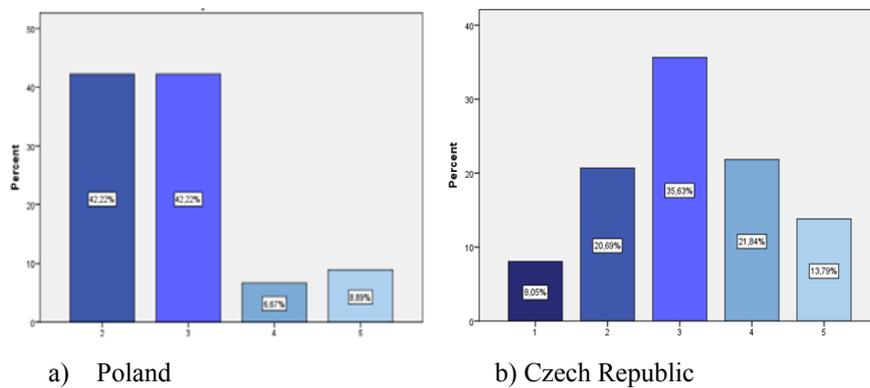
Source: own study

Assessment model of customer service standards in Skoda dealerships depends on three leading variables: employee’s communicativeness (V1), employee’s commitment (V2) and the accuracy of the information provided by the employee (V3). These variables affect the comfort of customer service, customer satisfaction and the type of customer recommendation in relation to particular car dealership.

## 5 Results

Each measurement (test) began with finding a phone number on the website of a particular dealership (Section A). The customer performed a call. Based on the average values it was estimated that most telephone calls were conducted on Wednesday (27.22%), Friday (22.22%) and Monday (16.67%). The least number of telephone calls were performed on Thursday (8.89%), Tuesday (11.115) and Saturday (13.89%). In each country, the situation was shaped as follows.

**Fig. 2: Number of signals to answer the call**

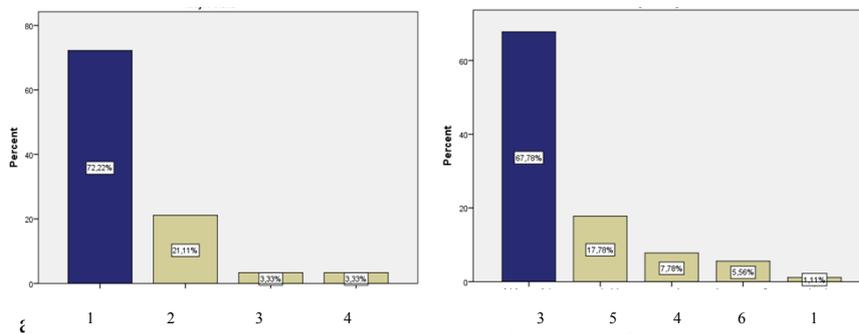


Source: own study

The number of signals measured the waiting time for connection with the employee alleged reaction time. It turned out that most often customers waited 3 signals to receive the connection (38.98%). Other results are as follows: two signals - 31.64% of customers, four signals - 14.12% and five signals - 11.30%. It is worth noting that employees answered the telephone call also after the first signal. This occurred only in the Czech dealership in 3.95% of the cases (Figure 2a, 2b).

In section A were also assessed such aspects as the way of answering a call and way to navigate the customer. In Poland, up to 72.22% of the calls are answered by automatic systems. In the Czech Republic, this figure is only 1.11%, which means that the Czech policy in the field of customer service is focused on direct contact with the employees. Automatic answering system is used occasionally (Figure 3a, 3b):

**Fig. 3: Method of answering the call**



1 telephone answering machine; 2 customer services; 3 sales department; 4 service engineer; 5 receptionist; 6 other employee

Source: own study

In Poland, after connecting with telephone answering machine, customers can be redirected to customer service or sales department or service engineer. In the Czech Republic, this order is developing in the following manner: salesperson, receptionist, service technician or another employee. Automatic machine is used in incidental cases. Another important issue was finding a solution to the problem of how to conduct a conversation with a front desk employee. Obtained results are shown in Table 1.

In the Czech car dealerships, customers during a conversation were informed about the recording of telephone calls (3.33%). Since in Polish car dealerships in most cases the conversation was carried on with the automatic machine, here replies of customers show that customers did not receive answers to the questions. In Czech car dealerships, however, customers acknowledged that they had obtained the reply to their questions in 68.89% of the cases.

**Tab. 1: The procedure at the beginning of a phone call conversation**

Country	information about recording of the conversation	information about the answers to the questions	information about redirecting of a customer	information about a information to call later	acquiring contact data and information about contacting later
Poland	,00	,06	,90	,00	,04
Czech Republic	,03	,69	,21	,00	,03

Source: own study

In Poland, in 90% of the cases customers were redirected to the car dealership employees. In the Czech Republic only in 21.1% of the cases, the customer was redirected to another employee. Both the Czech Republic as well as in Poland at given stage of the conversation customers were not asked for the contact later. In Poland in 4.44% of the cases, and in the Czech Republic in 3.33% of the cases, customers were asked to leave information in order to be contacted later. At this stage, customers also assessed the behavior of the employee, whom they spoke on the phone (table 2).

**Tab. 2: Correlations Spearman's rho**

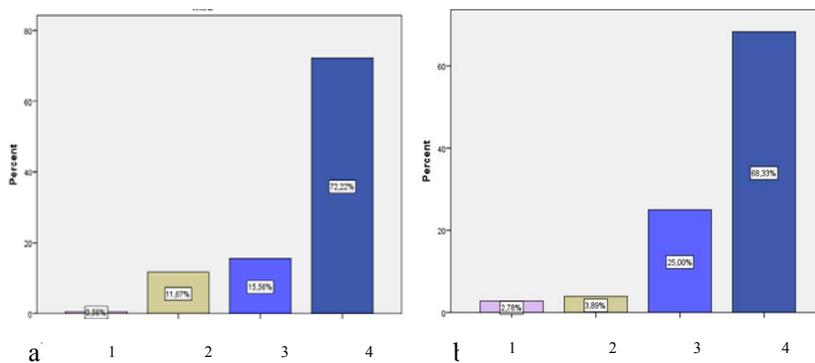
	politeness	communicative	accuracy of the information provided	commitment
politeness	1,000	,749**	,608**	,650**
communicative	,749**	1,000	,753**	,786**
accuracy of the information provided	,608**	,753**	1,000	,959**
commitment	,650**	,786**	,959**	1,000

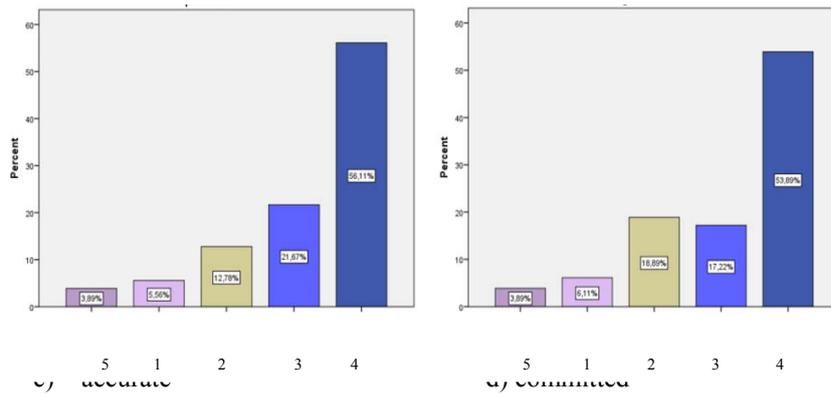
\*\* . Correlation is significant at the 0.01 level (2 tailed).  
 Source: own study

Spearman's rank correlation coefficient analysis indicated that there is a positive correlation, including a very strong relationship between the employee commitment and the accuracy of the information provided by the employee. There is a strong correlation between the variables: commitment and communicative, communicative and the accuracy of the information provided by the employee and the communicative and politeness. In contrast, a moderate relationship exists between attributes: accuracy of the information provided and the kindness and commitment and kindness.

Detailed research findings appointed as average values indicate that the front desk employees were assessed by customers as polite (Figure 4a), communicative (4b), accurate (4c) and committed (4d). However, one should pay attention to the alarming situation that has appeared for accuracy and commitment. For the first time, customers rated contact in the category "definitely not" what should not have taken place in any service company, moreover not in the car dealership.

**Fig. 4: Evaluation of personal qualities of front desk employees**





1 - rather not; 2 - neither nor or yes; 3 - rather yes; 4 - definitely yes; 5 - definitely no

Source: own study

Evaluation results for these variables constitute the basis of assessment of customer service standards applied by employees of the car dealerships. The results indicate that features such as politeness, communicativeness, accuracy of the provided information and commitment are significant for the customer. However, customer rating notes that this area requires improvement from the part of car dealerships. In Poland, the customer after beginning a telephone call heard "good morning" (84.44%), "hello" (14.44%) or "car dealership, please" (1.11%). Whereas in the Czech Republic the customer heard: "my name is ..." (34.44%), " car dealership, please " (33.33%) or "good morning" (32.22%).

Research proceeding in the Section C – sales ability /counseling showed the following. Based on the analysis of Spearman's rank correlation coefficient, chi-square was determined for the answer to the research problem, “whether the customer would enter into an agreement to purchase Skoda car in car dealership?”. Results indicate that customers, even though they feel deficiencies, ultimately, they appreciate customer service standards in Skoda dealerships. They feel comfort, satisfaction and in overall assessment, they express opinion that they would enter into the agreement with the dealership. Simultaneously, customers show areas, which require the immediate improvement and actions that should be enhanced. Customers have great or moderate confidence in the employees, but also up to 25.6% of customers do not experience the feeling of trust. It is a signal that an important feature indicated by customer in relation to employee needs to be improved by the car dealerships.

The last stage of customer service standards assessment concerned summarizing a telephone call with employee (section D). As a result of the final evaluation, customers despite weak points of the service would decide to sign a contract with a car dealership. In Poland, replies given by customers are clear. 94.44% of customers would sign the agreement (answers "definitely yes" and "rather yes"). The remaining 5.56% of the customers hesitated or would

not sign the agreement at all. Nevertheless, it is possible to regard such a result as the success of Polish car dealerships. In the Czech Republic, however, results are more diversified. 54,44% of the customers would sign the agreement (answers "definitely yes" and "rather yes"). 30% of the customers do not have an opinion in this area (the answer "neither nor or yes"). 15.56% would not sign the agreement (answers "rather not", "definitely no"). Obtained result is weaker than the result of car dealerships assessed in Poland. This means that telephone customer service need to be reconsidered and improved.

## **6 Discussion**

The essential difference between Poland and the Czech Republic is in applied policy concerning the telephone customer service. In Poland, 72.22% of the calls are answered by automatic systems, in the Czech Republic this percentage constitutes only 1.11% scarcely. In the Czech Republic, the emphasis is put on personal contact with the customer. In Poland, however, the policy of redirecting the telephone call to employee is used in accordance with the code of conversation chosen by the customer. The use of an automatic solution is perhaps justified by economic aspect, although authors suggest that this should be recalculated.

Customers argued that conversation with the automatic machine is annoying and largely discourages customers to re-contact with a car dealership. Customers expect fast, accurate and reliable service. It seems, therefore, that the solution applied by the Czech Republic car dealerships is advantageous. Customers at least certainly better perceived it, rather than solution applied in Polish car dealerships. Only in the Czech car dealerships a small percentage of customers were informed about the recording of telephone conversations. This means that either the dealerships do not record and archive recordings of conversations, or they do not inform customers about that fact. Recording is a key element of a telephone communication. It provides security against potential claims or may constitute a basis for managers' control. From the customer's perspective - it is a disciplinary measure. The customer would like to talk about the subjects related to the purchase/service of a car. This eliminates the so-called random customers. Therefore, obtained result is quite incomprehensible, and thus disturbing. This issue should be examined more closely. The enquiry concerning the telephone service provided interesting results. Both in the Czech Republic as well as in Poland customers at this stage of the conversation were not asked for contact at a later date. This means that if the customer has not got the connection, or has not received the information he had sought, he would simply look for another car dealership. Indeed, he felt ignored.

Authors believe that this stage of telephone communication is incredibly important therefore, the way of conducting the conversation and managers should recheck standards of the conversation. At this stage, the customer should be "led" by an employee, encouraged to cooperate and to contact in the future. If, because of objective premises, at that particular moment the customer cannot be served - natural seems to be asking him to leave data to be contacted at a later date. However, both in Poland and in the Czech Republic if these situations exist, it is a minimal percent. Authors believe that the irregularity that must be eliminated within an immediate effect. During the conversation with the front desk employee, customers also evaluated the behavior of the employee. Analysis of Spearman's rank correlation coefficient indicated that there was a positive correlation between all studied characteristics, i.e. the commitment, the accuracy of information provided, the communicativeness and the politeness. At the same time, there was a very strong relationship between the employee's commitment and the accuracy of information provided by him. As shown by the research results, the competencies of the front desk employees are essential. Their attitudes and personal characteristics affect the assessment of the car dealership by customers. Research results on the assessment of personal features are not impressive.

Although the front desk employees were assessed highly, there have been also some situations assessed as neutral (neither yes nor no), not really, and definitely not. This means that this area of service standards for both Poland and the Czech Republic are to be improved. At the beginning stage of conversation, employees used different phrases. Because the employee never knows, who the telephoning person is, he/she should always apply the professional vocabulary. Both in the Czech Republic as well as in Poland, employees in this issue do not have consistent standards. Authors believe that standard of service with the special emphasis on respect to the customer should be employed. Conducted analyses in the objective of the verification of the research problem allow to establish that customers, even though they sensed some deficiencies, they ultimately appreciated customer service standards in Skoda dealership. They felt comfort, satisfaction and in overall assessment, they express the opinion that they would enter into the agreement with the dealership. Simultaneously, customers showed areas, which require the immediate improvement and action, which should be enhanced. Finally, the results indicate that in Poland, up to 94.44% of the customers declare signing the contract with car dealership, while in the Czech Republic the fraction amounts to 54,44%.

## Conclusions

The research objective was carried out while conducting a discussion of obtained results authors pointed areas for improvement. These include such features as the accuracy of the information provided by employees, the employee's commitment to customer service. In addition, customers identified following issues: ability to inspire confidence, adaptation of the language to the customer perception and way of answering the questions. These elements need improvement from the point of view of front desk staff.

Results signaled a need to strengthen mental and professional side of employees. Employees require better training, greater awareness and a sense of responsibility for activities performed or greater control to perform reliably their labor duties. Authors assess that empirical research should be further carried out for a greater sample of companies and needs deepen insight into indicated areas. The model and measurement methods can be adapted to assess other services. Presented research has also utilitarian values.

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## EVALUATING LEVEL OF ENTERPRISE INNOVATIVENESS THROUGH INNOVATION RATIOS

Hana Janáková – Róbert Tomčík

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### Abstract

**Purpose:** An extension of theoretical and methodological approaches focused on assessment of the financial and innovation performance of enterprises was the main reason for preparing this paper. The aim consists of ratios proposal, allowing a general innovative-output analysis, mainly in connection with financial questions of a company. Subsequently, their use in preparing the equations describing innovative performance of enterprises according to detailed specification (sector assignment, company size, legal form, etc.) is assumed.

**Design/methodology/approach:** Based on current findings and information obtained from financial analysis, innovation management and published statistics on innovation, research and development, a set of indicators, which are able to quantify the innovative performance, was created. Analysis (subsequently followed by synthesis) further divided into ratio analysis, vertical analysis and decomposition of indicators were used in drawing up the innovative-oriented ratios. Saaty's criteria weighting method has been recommended in the process of compiling equations used to quantify the level of innovativeness among enterprises.

**Findings:** According to the theoretical and practical knowledge contained primarily in professional literature and by the use of selected methods, a set of categorized ratios, describing the financial characteristics of the company in connection with implemented innovations, was drew up. These characteristics include, for example, profitability of innovation outputs in a certain period of time, the impact of ongoing or finished innovations on liquidity, cost ratios on innovations and so on.

**Research/practical implications:** Simple evaluation process of both innovative and financial performance for a certain period is considered as the main outcome for practice. Future research may be focused on incorporation of the identified indicators (ratios) into comprehensive models, enabling to describe the innovative performance of a particular group of companies (due to selected conditions or restrictions) more sophisticated and with higher-explanatory power.

**Originality/value:** The aim of the paper constitutes initial phase of the prepared research that will be focused on evaluating the innovative performance and activity of industrial companies according to selected sector. However, it is assumed much higher applicability of the proposed ratios.

**Keywords:** Innovation outputs, Innovation performance, Ratio analysis

**JEL Codes:** G31, M31, O32

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## **Introduction**

In general, innovation performance is defined as one of the factors affecting competitiveness of a particular subject. According to the World Economic Forum (World Economic Forum, 2016) innovation development represents on a macro-level the driving force for innovation-driven economies, characterized by high efficiency in production of goods and services, which is a result of expanded business networks and sophisticated strategies of individual companies established in particular country.

Innovation is therefore indisputably one of the most important strategic and operational levers available to managers for creating competitive advantage, while knowledge of “innovation power” of company significantly supports internal decision-making process and provides information on the future innovation-based activities (Birchall, Chanaron, Tovstiga, & Hillenbrand, 2011).

Presented paper deals with enterprise innovation performance evaluation through innovation ratios. The concept of proposed metrics is based on the current needs to effectively evaluate and select the most suitable innovation project from a set of variants or assess the impact of projects a company already implemented within a defined period of time on its operation. Since these ratios primarily examine the very impact of particular innovation project (or projects) on company's financial position, they are derived from, and therefore visibly similar to, traditional ratios used by financial analysis. Moreover, they can be further combined and analyzed in order to answer more complex questions, such as the mentioned innovation performance of companies.

## **1 Brief literature review**

There are various techniques for measuring innovation performance. The basic and most common approach to evaluation of performance lies in using diverse indicators often associated in categories by certain characteristics, features and similar attributes, respectively.

Hagedoorn and Cloudt (2003) assessed the innovation efficiency of enterprises in four high-tech sectors using indicators as R&D inputs, number of patents, citations of patents and introduction of new products. They have found that these elements expressed well a latent variable known as "innovation performance".

Positive impact not only on innovation and performance of the company, but also on its efficient operation in general, as a result of organizational learning (and organizational knowledge as output) was demonstrated by Jiménez-Jiménez and Sanz-Valle (2010).

Song-Kyoo (2014) evaluates innovation performance of enterprises using the Analytic Hierarchy Process method. Selected criteria are further sorted into categories. These consists of

innovation inputs indicators describing financial, human and intangible resources such as patents or licenses etc.; process-oriented indicators such as process speed, diverse of idea-generation process and innovation portfolio balance, although other are mentioned as well, and output-related measures, which include the number of new products or service launched, portion of revenue in core categories from new products, portion of profit from new customers and new categories and return on investment ratio (ROI) by innovation.

Financial ratios are often used as criteria describing financial component of company's innovation potential, and thus partially an innovation performance. These indicators include for example liquidity, debt, profitability, investment, or even more complex ratios such as financial stability ratio. Characteristics based on research and development and its funding are also used extensively (Valitov & Khakimov, 2015; Mairesse & Mohnen, 2010; Cooper, Knott, & Yang, 2015).

J. Przychodzen and W. Przychodzen (2015) describe eco-innovations in Central Europe and study their impact on traditional financial performance ratios of enterprises. Their study indicates that eco-innovators generally achieve higher levels of return on assets and equity and lower earnings retention. Additionally, their research also showed that firms introducing eco-innovations on market are usually larger and with more available funds than conventional firms.

Many publications, e.g. Benner and Veloso (2008) or Kaynak (2006), pay attention to process innovations and their impact on the financial performance of companies measured by ratios such as return on assets and equity or basic earning power. Although the results are often diverse (Kaynak, 2006), Klingenberg, Timberlake Geurts and Brown (2013) believe that there is no consistent relationship between these indicators and inventory management as a representative field where process innovations significantly affect performance.

Virtually every process involved in the conversion of invention into innovation and subsequent introduction of resulting innovation into practice represents a project for the enterprise. The assessment of its "benefit" is often carried out using diverse criteria known as capital budgeting ratios. From the simplest (leaving aside their explanatory power for this time) such as payback period or profitability index to the complicated ones such as discounted version of the payback period, companies widely use net present value, rate of return or internal rate of return or any suitable combination (Brealey, Myers & Allen, 2014). To some extent these are actually ratios that help in decision-making and answer the question whether the project should be accepted or rejected.

Even from a small sample of publications mentioned, there are many disparate ratios. Their correct selection and establishment, respectively and subsequent combination can effectively quantify and describe the problem stated. Since there could be created many such measures, ratio analysis represents an important tool in business practice and performance assessment.

## **2 Aim and methods**

The aim of this paper is to propose a set of ratios allowing the general analysis of enterprise performance due to realized innovations. Evaluation process is based on planned (in case of prediction) or achieved (in case of ex post analysis) innovation outputs. The second part of main objective is the use of selected indicators in construction of equations describing innovation level of enterprises grouped by certain distinctive characteristics (industry, company size, legal form, etc.). However, it is necessary to obtain information directly from businesses to finalize these models. Since this step is the subject of upcoming research, only the process of designing is described here.

Completion and categorization of selected indicators are based both on recommendations of academic literature and research but also on managerial experience. This information help to select such indicators which can relatively simply and concisely answer the following questions:

1. What is the level of innovation performance of company?
2. How did innovations affect or how will they affect the financial performance of company, respectively?
3. Which variant of available innovation projects should be implemented?

Ratio analysis, vertical analysis and decomposition of synthetic indicators followed by synthesis were used in paper. Saaty's method of determining the weights of criteria (ratios) is recommended in designing of equations assessing the performance due to introduced innovations.

## **3 Results and discussion**

Ratios presented in academic literature are mostly grouped into categories with similar characteristics or according to specific objective. For example, banks examine liquidity ratios, shareholders monitor profitability, creditors usually focus on indebtedness of particular subject (Špirková & Ďurechová, 2013) and ratios describing cost efficiency are important for managers (Kotulič, Király, & Rajčániová, 2010). Similar merging is also effective in case of indicators expressing financial performance due to implemented innovations.

Despite initial similarity to the traditional financial ratios there is a significant difference. Innovation-oriented ratios quantify mostly the financial characteristics of a specific innovative output or the impact of all these outputs on a whole entity in particular period and although they are based on their financial variants, they are more specific.

In order to interpret a particular indicator, it is necessary to know the range of acceptable values. In case of traditional financial ratios, it is possible to obtain this information from academic literature, due to finished researches, e.g. following quantile values achieved in relevant sector, or

using values from previous years if an enterprise was in good financial position. However, these values are not applicable to the further presented modified ratios, interpretation of results can be realized only by the nature of indicator. Therefore, it is useful to divide ratios into two categories according to whether it is more efficient (or desirable) higher or lower value (abbreviated as MAX or MIN). Currently, there is also a prepared research focused on companies established in Slovakia and specializing in manufacture of motor vehicles, equipment and accessories which will provide the answer to reference values for selected types of proposed indicators in connection to this sector.

Further adjustments or decompositions of traditional ratios lead to more variants either in financial or innovation-oriented types.

### 3.1 Innovation ratios based on profitability

As a formula, profitability ratios put company's income into proportion with a particular input or output. Table 1 contains basic profitability ratios based on innovative outputs in two dimensions. The first one expresses overall income generated from innovative outputs due to certain synthetic variable of a company for a defined period (usually one year) and the second one is useful to compare the profitability level of various innovation projects among themselves.

**Tab. 1: Basic innovation ratios based on profitability**

Title	Ratio – 1st dimension	Ratio – 2nd dimension	Ratio type
<b>Return on Innovations</b>	NI from innovations/Book value of innovations	NI from innovation/Book value of innovation	MAX
<b>Return on Revenues from Innovations</b>	NI from innovations/Revenues from innovations	NI from innovation/Revenues from innovation	MAX
<b>Return on Sales from Innovations</b>	NI from innovations/Sales from innovations	NI from innovation/Sales from innovation	MAX
<b>Return on Expenses (Expenditures) on Innovations</b>	NI from innovations /Expenses (expenditures) on innovations	NI from innovation /Expenses (expenditures) on innovation	MAX
<p><b>NI from innovation(s)</b> = Net income from innovation(s) defined as difference between revenues from innovation(s) and expenses on innovation(s) in a certain period.</p> <p><b>Sales from innovation(s)</b> = Sales of own innovated products, services and revenues from sale of innovations in a particular period.</p> <p><b>Book value of innovation(s)</b> = Value of innovation(s) expressed in financial units. This include both tangible and intangible fixed assets (innovation itself) as well as semi-finished and finished innovated products (innovation outputs).</p>			

Source: own processing

Ratios listed in Table 1 can be interpreted as an amount of money generated in relation to respective parameter for in a specific moment. For example, Return on Innovations ratio expresses

how much euros were (or could be) created by existing (or planned) innovations from one euro spent on these innovations. In other words, effectiveness of innovations is evaluated.

### 3.2 Innovation ratios based on indebtedness

Decomposition of innovation ratios based on profitability leads to more specified ratios which helps to describe the structure of resources spent on innovations (table 2).

**Tab. 2: Selected innovation ratios based on indebtedness**

Title	Ratio – 1st dimension	Ratio – 2nd dimension	Ratio type
<b>Innovation Leverage Ratio</b>	Equity and liabilities used on financing innovations/Equity used on financing innovations	Equity and liabilities used on financing particular innovation/Equity used on financing innovation	MIN
<b>Total Indebtedness of Innovations</b>	Liabilities used on financing innovations/ Equity and liabilities used on financing innovations	Liabilities used on financing innovation/ Equity and liabilities used on financing innovation	MIN
<b>Credit Indebtedness of Innovations</b>	Bank loans and borrowings used on innovations/ Equity and liabilities used on financing innovations	Bank loans and borrowings used on innovation/Equity and liabilities used on financing innovation	MIN
<b>Equity and liabilities used on financing innovation(s)</b> = Money obtained from ownership equity and in form of liabilities used on financing innovation(s).			

Source: own processing

The lower the value of presented ratios, the less affected the innovations are by sources that come from outside a company. However, it does not mean that company should always try to achieve the lowest possible level of indebtedness. On the other hand, sustainable growth as well as financial stability management should be primarily taken into account. Both of mentioned factors are markedly influenced by high level of indebtedness.

### 3.3 Innovation ratios based on liquidity

Innovation ratios based on liquidity reflect the ability to pay obligations within innovations. Analysis of current assets in relation to innovations defines three elementary ratios (table 3).

**Tab. 3: Elementary innovation ratios based on liquidity**

Title	Ratio – 1st dimension	Ratio – 2nd dimension	Ratio type
<b>Innovation Cash Ratio</b>	The most liquid assets from innovations/ Current liabilities used on innovations	The most liquid assets from particular innovation/ Current liabilities used on innovation	MAX
Title	Ratio – 1st dimension	Ratio – 2nd dimension	Ratio type
<b>Innovation Quick Ratio</b>	The most liquid assets and accounts receivable from innovations/Current liabilities used on innovations	The most liquid assets and accounts receivable from innovation/Current liabilities used on innovation	MAX
<b>Innovation Current Ratio</b>	Current assets from innovations/Current liabilities used on innovations	Current assets from innovation/Current liabilities used on innovation	MAX

Source: own processing

Using innovation ratios based on liquidity is much more appropriate in those types of innovations that directly generate funds (product innovation) rather than in case where company's financial performance is strengthened by reducing expenses and expenditures respectively (e.g. process and/or organizational innovations). Exchanging the current numerator for cash flow provides modified ratios that could help in decision-making process of any innovation project.

### 3.4 Innovation input-to-output ratios

Innovation inputs in relation to outputs can be evaluated by input-to-output ratios (table 4). Either expenses or expenditures are considered as inputs while revenues and receipts respectively represent outputs.

**Tab. 4: Basic innovation input-to-output ratios**

Title	Ratio – 1st dimension	Ratio – 2nd dimension	Ratio type
<b>Innovation Expenses (Expenditures)-to-Revenues (Receipts) Ratio</b>	Total innovation expenses(expenditures)/ Total innovation revenues (receipts)	Expenses (expenditures) on particular innovation/ Revenues (receipts) from innovation	MIN
<b>Production Costs Effectiveness in Relation to Innovations</b>	Production costs in relation to innovations/Total innovation revenues (receipts)	Production costs in relation to innovation/Revenues (receipts) from innovation	MIN
<b>Innovation Interest-to-Revenues Ratio</b>	Interest expenses due to innovations/Total innovation revenues	Interest expenses due to innovation/Revenues from innovation	MIN
<b>Production costs in relation to innovation(s) =</b> Raw material and energy plus supporting services used in production of innovative output(s).			

Source: own processing

Although it is generally preferred to continuously reduce expenses, it is recommended to do so to a certain level only. Otherwise, lower quality of products or procedural errors could appear.

### **3.5 Validation and comparison**

Presented innovation-oriented ratios, primarily aimed at evaluating the effectiveness of innovation outputs, are based on modification of traditional, most frequently used financial ratios. We therefore used currently published sources within the financial analysis field in our selection and modification. Since a large number of such ratios can be created, it is appropriate to reduce and validate them in a certain way in relation to a predetermined goal. One of the method to remove redundant indicators, including their validation, is described by De, Bandyopadhyay, and Chakraborty (2011). Using the method of correlation, factor analysis, multiple regression and cluster analysis, indicators are sequentially set aside until a set of representative ratios (across the different categories – factors) that ensure a significantly less time-consuming evaluation of both financial and business performance is obtained. The reason is the use of less number of indicators. However, the authors remind that their research is very specific and applicable within a particular country, industry and time period as well.

In order to verify the proposed set of innovation-oriented ratios, it is necessary to carry out calculations of various indicators on a selected sample of enterprises. In connection to our long-term goals, we plan to aim our research on companies specializing in the production of motor vehicles, equipment and accessories. Applying a combination of the abovementioned methods, presented ratios can be validated.

To evaluate the innovation performance of an enterprise or the effectiveness of individual innovation outputs, the proposed innovation-oriented ratios are used in a suitable combination rather than separately. They represent only partial result when used separately. In addition, they carry information from the traditional financial indicators, thus differ from the complex or purely innovation metrics used by the authors (Hagedoorn & Cloudt, 2003; Song-Kyoo 2014) and, on the other hand, from exclusively financial ratios (Valitov & Khakimov, 2015; Kotulič, Király, & Rajčániová, 2010). This opens up new opportunities for assessing innovation performance and business outcomes.

### **3.6 Evaluation of innovation performance**

Innovation performance of a company in a particular industry can be evaluated by appropriate selection and combination of innovation ratios. However, it is necessary to carry out research focused

on critical values determination of chosen ratios. Subsequently, these indicators can be merged together into much more sophisticated models. An example of such procedure consists of:

1. identification of number and types of ratios based on company's innovative activities,
2. criteria-weights determination process,
3. range of acceptable values of individual indicators determination process,
4. definition of the proposed model range and interpretation of company's performance.

First, it is necessary to select such indicators, that will effectively ensure the innovation performance quantification. Emphasis should be, however, given to reduce redundant data, e.g. the model should not contain variables that describe essentially the same fact – relations between ratios are not expressed by simple mathematical operations.

Second, due to higher explanatory power it is much more effective to create multiple equations, for example according to firm size. The simplest company size measurement can be brought by average number of employees per selected period (usually one calendar year). Subsequently, to each size level belongs one performance-evaluation equation with the same combination of pre-selected ratios. Criteria weights within equations are calculated with the help of appropriate method afterwards. Saaty's method of criteria weighing is recommended here.

Third, acceptable values of individual ratios are defined. The lowest limit represents lower quartile (in the case, when higher value of particular ratio is desirable) or upper quartile (in the opposite case) in a selected sector and time. The higher the ratio value (or lower, due to the type) compared with its lowest (or the highest) permissible value, the higher impact on the overall result occurred within this partition. Maximum allowable value of each indicator is characterized by reaching and exceeding the upper limit (upper quartile for maximum indicators, lower quartile for minimum ratios). However, the determination of these values should be kept up to date resulting into periodic updates – usually one update per calendar year.

Final step consists of proposed model interpretation. The overall equation describes innovation performance of enterprise based on its innovation characteristics. Threshold values move from 0 to 1 or 0 % to 100 %, respectively, where 0 means the lowest and 1 maximum (ideal) level of this synthetic variable.

## **Conclusion**

The aim was to propose a set of innovation ratios describing specific features of a company emerging from implementation of innovations or already introduced innovations. Those indicators are further classified into groups based on common characteristics and field of evaluation. By using an appropriate combination of innovation ratios, companies can get preliminary answers to questions

related to implementation and funding of innovative projects. Proposed ratios are therefore a kind of intersection between the assessment of innovation and financial performance of businesses.

Also, the use of these ratios helps to find an answer to question about innovation performance. Since it is necessary to carry out research that will give information according to finalization of performance evaluation models due to certain economy sector or industry classification, the article contains only a general procedure for drawing up these equations. Future research should focus on the behavior of selected indicators in a particular industry with regard to define both acceptable minimum and maximum values in these restrictive conditions.

However, it is assumed significantly more extensive use of created ratios than given examples.

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## **BUILDING LEAN BODIES WITH LEAN MANAGEMENT: IMPLEMENTATION OF LEAN PRINCIPLES IN ENTREPRENEURSHIP**

**Jan Janečka – Felipe Martinez**

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### **Abstract**

**Purpose:** This paper presents the entrepreneurship specifics of lean management implementation for continuous innovation and business sustainability. It summarises the results of lean management implementation in a condition and strength-building company. The firm applies a community-based business model. The firm expansion and the constraints on the operational management processes of this SME motivate the research.

**Design/methodology/approach:** The research design for the paper is a case study (Bryman & Bell, 2015). The research explores the implementation of lean principles and tools in the firm. The case study compares the specific parameters of the internal processes before and after lean implementation. The parameters vary based on the project but are usually time, distance and financial aspects. Personal interviews with first-line workers provide information about the consequences of this approach among the personnel.

**Findings:** The firm applies lean principles and tools in the processes of Check-in, Purchase, Supply and Check-out. Lean implementation provides specific improvements in these processes such as 66% reduction in lead time, 85% reduction in distance and the creation of the first standard for these processes. Preliminary non-structured interviews show the positive reaction of the personnel with reference to the lean implementation. The sustainability of the business model requires standards at each small activity of the organization. These standards allow the organisation to learn from their activities, to track improvements and they provide management with clear information about operations.

**Research/practical implications:** The paper offers new evidence of lean implementation in a non-traditional and modern sector. The firm obtains practical implementations to improve its operation. Future research will explore the operations leanness of similar organisations.

**Originality/value:** The novelty of the paper confronts the expectation that a company with a mission to help people build lean bodies possess a lean operation. However, process mapping and other lean analysis suggests the opposite. The evidence from this case study brings value and motivation to many entrepreneurs for other similar companies.

**Keywords:** Lean, condition and strength-building, fitness, gym

**JEL Codes:** M10, M11, M13

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## **Introduction**

The catchphrase “Lean” management has emerged as an alternative explanation of the Toyota Production System. It connotes fitness, health and muscle tone (Womack & Jones, 1996). The analogy compares the organisation to the human body. “Organisations as well as individuals need to take action in order to become fit, lean and healthy” (Norlyk, 2011). This paper explores a lean paradox. Does a company dedicated to helping people build lean bodies possess a lean operation? The paper analyses the current operation of a fitness company. It determines the waste and it implements lean management to increase organisational fitness. The paper consolidates evidence to determine lean management as a tool for continuous innovation and business sustainability. Additionally, it provides the company with a management framework suitable for their mission of helping people build lean bodies.

### **1 Lean, sustainability and entrepreneurship**

These three management approaches encompass several consistent similarities. The literature review determines the current alignment of these approaches.

The holistic definition of Lean Management presents this philosophy as a set of several approaches and tools that aim to increase value for the customer by reducing waste in the organisation within a continuous improvement environment (Hines, Holwe, & Rich, 2004). Several of these process improvement tools are associated with different approaches such as the Quality Management System or Toyota Production System (Womack & Jones, 1996).

Lean management is a complementary tool for sustainability management. The integration of lean, six sigma and sustainability demonstrate this (Cherrafi, Elfezazi, Chiarini, Mokhlis, & Benhida, 2016). The continuous improvement element of Lean Thinking facilitates innovation in processes and business sustainability (Womack & Jones, 1996).

The existence, discovery and exploitation of opportunities determine the entrepreneurship framework and the process of creating a new organisation is part of it (Shane & Venkataraman, 2000). Lean Management comprises a process of improving methodology (Womack & Jones, 1996). It analyses processes to find waste in order to increase customer value (Hines, Holwe, & Rich, 2004). It promises to increase value with fewer resources. The creation of a new company brings together several resources to determine products or services (Shane & Venkataraman, 2000). Therefore, Lean Thinking offers entrepreneurship several tools to improve the establishment of a new company or project. The consolidation of this approach is known as Lean Start-up. This methodology involves several activities that allow

the entrepreneur to reduce waste in the firm creation process (Ries, 2011; Baughn & Suci, 2015).

The usual critique of Lean Management is its manufacturing origins. The automotive industry and goods manufacturing systems are the traditional scope of Lean Management. However, the methodology extends its boundaries beyond them. The lean office (Cavaglieri & Juliani, 2016), lean higher education (Balzer, Francis, Krehbiel, & Shea, 2016), lean healthcare (Poksinska, Fialkowska-Filipek, & Engstrom, 2017) and others demonstrate the successful implementation of this approach in service operations. Therefore, the applicability of lean is as broad as the possibilities of sustainability management and entrepreneurship.

## **2 Methodological framework**

This paper explores the entrepreneurial and sustainability implications of applying Lean Management in a company outside the manufacturing sector. The research design of the paper is a case study (Bryman & Bell, 2015). This paper employs the DMAIC tool as an overall framework (Tang, Goh, Lam, & Zhang, 2007). The tool facilitates the definition of the processes of the approach. Then, it provides guidelines for the measurement of those processes. This allows the researchers to analyse possible waste. The improvement section of the tool specifies specific projects to implement and the section of control sets up the variables to follow in order to establish continuous improvement of the processes.

The selection of the company constitutes the first step of the methodology. The researchers look for a company within the sport services sector as a clear representative of non-manufacturing companies and as a good example of the lean paradox (lean service vs. lean organisation?). Furthermore, the company needs to acknowledge the need for improvement due to organisational failure or organisational development.

The following step is to understand the organisation as a single main process. The SIPOC tool provides a global analysis of the firm's main service. This tool identifies the main sections of the service, their suppliers and customers. The application of the SIPOC tool in the global scale of main service facilitates the selection of the relevant processes based on the observed waste, high customer contact and payments by customers. This analysis determines the focus on processes related to the core business.

The selected processes are deeply analysed with process mapping tools such as SIPOC, flowchart and layout. The process mapping allows the detection of possible waste in the system.

The process diagram extends the findings with specific measures of time and distances. The spaghetti diagram illustrates the current flow of personnel and material. The consolidation of these findings identifies the waste in the system.

Each case of waste influences the system with different impact. The process complexity, cashflow, customer satisfaction are the criteria to determine implementation priorities. The ABCXYZ tool facilitates this analysis. The output of this analysis specifies the lean tools to implement in the system.

The comparison of the system before and after the implementation quantifies the impact of the lean approach in the system. Additionally, individual semi-structured interviews with the personnel of these processes extend the findings with a qualitative approach.

### **3 Lean implementation and findings**

The company selected is FreshKruhac (FK). The firm provides circuit training - strength and conditional high intensity interval training. It helps people get and maintain a better physical condition and overall stamina. The company operates its own gym. It offers several types of training based on the customer's characteristics. These include solutions for athletes and sportsmen to fitness and recreational customers. Additionally, the firm sells dietary supplements (protein, carbohydrate and ion drinks i.e.) and fresh fruit. FK has developed a community-based business model (Lee & Cole, 2003). The members of their community have access to information about diet and training, educational seminars, sports tournaments, sports equipment and clothes. This also includes the organisation of fitness camps. These are 3 to 5-day tours with lots of sports, contests and fun. The company supports members' initiatives for other activities such participation in sports contests on behalf of FK name.

The current situation of FK shows evidence of possible operational collapse in the near future. FK is a successful company. It operates two facilities and has over 2000 customers every week. The company shows 300% growth in 2016 and it has become a reference for other companies in the field. However, this rapid growth brings constraints at the operational level. The operation lacks process identification. Capacity management shows that the company is working at the limits of the current operation. Management perceives this growth and low process approach maturity as causes for possible future operational failure and therefore the company is searching for professional advice on operational improvement.

The application of the first SIPOC characterises the FK main service as 5 processes. These are Customer check-in, Training (core-business), Purchase, Customer check-out and Clean-up. The observed waste, high customer contact and payments by customers identify the

processes of Check-in, Purchase and Check-out as the ideal processes to start the lean implementation. Furthermore, the process of Training possesses high complexity and specialisation in the sports and fitness discipline. The process of Clean-up is a consequence of the other processes. The lean implementation of these two processes continues the lean transformation of the organisation but are outside the scope of this paper.

The process mapping identifies the start of the Check-in process when the customer enters the reception hall and the end of the process when the customer is ready for the Training. The process requires an FK card per customer. It contains the information of the FK member and the corresponding credits that allow the customer to attend the training. The most common card is the FK card – a prepaid membership ticket (About 87% of visitors). The measurement of the processes registers times in two scenarios. The first scenario includes the customers that arrive at the training holding the FK card. This has an average lead time of 18.5 seconds. The second scenario includes clients that search for the FK card at reception. This has an average duration 30.8 seconds. Moreover, the measurement analysis shows that two and more people arriving at reception requesting Check-in at the same time cause significant delays (sometimes double the time). It is common that customers arrive together. Each lesson holds 18 participants who start training at the same time. Reception in this case becomes a bottleneck. This current situation shows long lead times and therefore it causes a late training starting time which negatively influences the customer's experience.

The main improvement to this process implements electronic passes with barcodes instead of the old paper ones. This solution improves the lead times of the first scenario customers by 6.7 seconds and 10.9 seconds of the lead time for the customers in the second scenario. The continuous improvement of this process applies visual management or Mieruka. Simple messages reminding the customer to arrive with the FK card ready in hand move the waiting time of searching for the FK card out of the reception space. The messages are situated in the entrance of the gym but also through electronic communication with the customer (Social media, emails, etc).

The Purchase Process consists of a customer ordering their desired drink, the receptionist mixing the corresponding drink and ends with payment. The ABCXYZ analyses margin and sales frequency of the sold products. This tool shows that two protein shakes represent almost 80% of sales. There are about 30 to 40 drinks per shift. The drink preparation process requires the receptionist to find the drink ingredients in several locations within the bar and storeroom. The fruit is in the freezer which is located in the storeroom. The receptionist takes an adequate portion of fruit and walks back to the front desk where the mixer is located.

The most sold protein powders are next to the less popular products on an elevated shelf (about 2 metres high). The receptionist takes the corresponding protein powder adds it to the mix and the powder is returned to the shelf. The reception has a coffee machine. The ABCXYZ analysis shows a similar margin but low sales frequency of this product in comparison with the protein shakes (About 4 to 6 coffees per shift). The current placement of tools and ingredients reduces the efficiency of the process. The coffeemaker currently placed on the reception counter serves fewer drinks but occupies a larger space on the reception desk. This contributes to overall disorder and an unclean environment.

The layout analysis with the spaghetti diagram shows several improvement options. All the ingredients related to the protein shakes (high margin and high sales frequency) are located out of flow in several parts of the space. The solution integrates those ingredients and the mixer as close as possible to reduce the transportation of material and unnecessary movements by the personnel. The solution to this situation follows the 5S methodology. This starts by understanding the work of the personnel. Then, it identifies the minimum necessary items to perform the tasks. Later it standardises the solution and it follows the development of the solution to constantly improve workers' tasks.

The new layout introduces a smaller freezer under the reception desk near to the mixer. The protein powder is located under the desk just above the freezer. The coffee machine is located away from the front desk. These changes reduce receptionist walking movements from 30-40 times per shift to 4-6 times. The distance measured shows a reduction from 120-170 meters per shift to 20-30 meters per shift. This means a reduction of 5 seconds on the overall purchase process lead time. Another 2-3 seconds per order is gained by moving high frequency protein flavours sold close to the freezer on the shelf under the bar. This new layout ensures fewer motions for the receptionist and less lead time for the customer.

The analysis of the Purchase process opens several queries on the activities related to suppliers. This supply process lacks formal representation. It is just a random set of actions. Someone from the personnel registers goods shortage. This information is sent to the administration office via email, chat messages services or in person. The administration office workers randomly order the amount of goods without any formal procedure. Then, the system waits until the supplier delivers. The usual delivery takes 2 weeks. The applied solution determines the first standard in these activities. It implements a kanban-like supply system and Mieruka visual management. The visual signs show gradually the consumption of powder. The 2 weeks expected delivery time determines the amount of powder that has to be in stock in order to contact the supplier for more goods. This is about 30kg shown as 6 bags. The kanban signals

the minimum stock. This alerts the personnel to start the supply process. This supply system ensures an adequate amount of powder and reduces the likelihood of running out of products.

The check-out process analysis shows fewer improvement opportunities than the previous processes. The process is defined from the customer entering the reception after training to the customer leaving reception (the gym). The data is difficult to obtain since customers tend to spend very different amounts of time in the reception after training due to different causes. The FK has a friendly environment. Customers often chat amongst themselves and with the personnel after training. However, there are customers that immediately leave the facilities due to their personal agenda. Additionally, the Check-out process is a less complex process which reduces the possibilities of quick win improvements. Moreover, the analysis shows that the most significant waste in this process is related to customer mistakes. If a customer forgets to return the locker key, it is necessary to go back to the dressing room. This means an unnecessary walking distance of approximately 45m.

The proposed solution includes visual management or Mieruka. The signs in the dressing room remind customers to bring their locker key along to the reception. There is one case in each four shifts. It represents a low waste in the overall system but its solution represents the first standard in this process.

Shortly after the first implementations of lean tools FK employees displayed scepticism about the benefits of these changes. However, semi-structured interviews with the 3 employees involved in the improvement indicated that implementation of lean tools and principles have had a positive impact on their work and they facilitate the process of their workflow.

**Tab. 1: Improvements summary**

Process	Current Situation	Solution	After Implementation	Improvement
Check-in	Lead time 30sec	Electronic passes and Mieruka	New lead time 11sec	Lead time 66% faster
Purchase	Distance per shift 150-200m;	Layout change, 5S	Distance per shift 20-30m;	Walked distance decreased by 85%
Purchase	Lead time 80.1 sec	Layout change, 5S	Lead time 75.1 sec	First standard
Check-out	Unknown	First standard	Lead time 18.6 sec	First standard
Supply	Random actions	Kanban unit and Mieruka	Kanban signal at 30kg stock	First standard

Source: The authors

## 4 Discussion

The current situation of FK comprises several characteristics that allow the implementation of lean management. However, it is important to recall the management attitude towards the improvement. The case shows specific real improvements of the operation. Some solutions are simple, other solutions present higher complexity. But management appreciates all of them. This case illustrates that the management attitude towards the improvement is essential for lean implementation.

A preliminary overview of the FK operation shows a lower complexity and sophistication than a manufacturing operation system. The separated analysis of these processes illustrates the simplicity of the operation. However, these processes run in parallel and operate simultaneously for more than one customer. The first observation of the operation shows a group of unrelated activities that constantly interrupt their individual flows. In this situation, the lean approach suggests the identification, analysis and improvement of the separate parts of the systems. This approach allows FK to develop small solutions that are seen as minor improvements (a few seconds or meters) but they impact the overall operability of the system.

The absence of process flow and high process variability develop rudimentary and basic standards. Three out of the five registered improvements constitute the first standard of the specific process. These results are less attractive for traditional management. But FK management see them as the initial guide for approaching the complexity of the operation which is crucial for business sustainability. It is a starting point for continuous improvement and it is essential to maintain and actualize these standards. For the first time in the history of the firm

these standards allow the organisation to learn from their activities, to track improvements and to provide management with clear information about operations.

The community-based approach to customers is greatly valued among clients who therefore have more patience with imperfections in FK operations. Although it is a strong competitive edge, the organization must not rely on customers' goodwill and forgiveness. On the contrary, in order to support the promoted FK service the company must constantly improve internal processes, get rid of various forms of waste and become as lean as possible. This approach gives FK the opportunity to sustain and manage its growth.

## **Conclusion**

This paper offers new evidence of lean implementation in a non-traditional and modern sector. The paper includes the implementation of several lean tools across the DMAIC cycle. Process mapping, simple measurement systems, data analysis and others shows the extent of applicability of lean tools in any industry.

The evidence of business sustainability is only possible by measuring standards over time. Lean principles compass tools that allow the creation of these standards and therefore the possibility to measure sustainability.

The implementation of lean at FK shows that any type of firm can obtain specific measurable benefits from standardization. This case presents several practical implementations that allow FK to improve its operation. The lean paradox, lean service in a lean operation, becomes a characteristic of the company that can be used as part of their marketing promotion. The evidence from this case study brings value and motivation to many entrepreneurs for other similar companies.

Future research is necessary to constantly show the benefits of the lean approach in any industry. The analysis of similar operations in different fitness companies will bring new perspectives for this specific sector.

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## **DEVELOPING ENTREPRENEURIAL SKILLS UNDER THE CURRENT CONDITIONS OF THE EDUCATIONAL SYSTEM**

**Filip Ježek – Zdeněk Vavrečka**

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### **Abstract**

**Purpose:** The key role of the educational system is to prepare individuals for their future work life. Sooner or later the pupils or students have to choose between employment and running their own business. The aim of the paper is to provide an insight into how the current primary educational system participates in developing the entrepreneurial skills which are needed, especially under conditions of regional disparities and unemployment problems.

**Design/methodology/approach:** The research is based on an analysis of primary school documents and questioning pupils based on standard psychometrics. The most indispensable part of the research is the analysis of the relationship between the competence and skills declared in the school documentation to be developed and the true personal characteristics of the pupils. The sample contains pupils of the final classes in the selected primary schools.

**Findings:** The research leads to the conclusion that the current primary educational system seems to be unsatisfactory with respect to developing the entrepreneurial skills of the individuals.

**Research/practical implications:** The paper includes implications for school management. Developing entrepreneurial skills may be enhanced through adjusting teaching methods and the curriculum.

**Originality/value:** The paper contains the specific research which contributes to the discussion of how primary schools should be adjusted to the requirements and options emanated from the real world.

**Keywords:** Educational system, entrepreneurial skills, personality traits

**JEL Codes:** A13, A21

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## **Introduction**

Classical and neoclassical economic theory classes taught in schools commonly work with the essential factors - soil, resources, labour and capital. These factors are becoming variable in economic models, describing the optimization problem of resources allocation. It is necessary to look for ways to ensure their most effective use in relation to the unlimited needs of society, because the amount of production factors is limited. In the case in which we are assuming the existence of an economic system that is based more or less on the principles of the market mechanism we cannot ignore the role of the entrepreneur. This role must be understood in terms of the implementation of activities towards working with the factors leading to the creation of added value, which is required. It is necessary to include entrepreneurship with the above-mentioned factors, because the factors of production are de facto social resources. This concept is not often used in current economic theories, even though the basics can be found in the first third of the 19th Century. The French representative of classical political economy, J.B.Say, describes the production cost as the service cost of the production factors. In addition to annuity, wage and interest rate it also includes business profit (Chigbo, N.D., 2014). The service price of the production factors is in its concept derived from the value of production. This is clearly describing the role and importance of the entrepreneur, who represents the link between consumption and production. Without the activity of the entrepreneur, in an economic system based on the market mechanism with regards to social needs there would only exist a limited level of production. The ratio of extensity and intensity of the business (business activity) in a given economy should be marked there as entrepreneurship. A prerequisite to the development of entrepreneurship is initiative – a characteristic of an individual which is manifested in practical life by a combination of observable behaviour - creativity, non-conformance, innovatory, self-realization etc.

**Tab. 1: The factors and assumptions of their growth**

Factor	The price for the factor service	Growth assumptions
land and natural resources	rent	extensive growth: colonization of new planets, new habitats intensive growth: more efficient use of agricultural land, more efficient procedures for retrieving resources
labour	wage	extensive growth: the growth of the birth rate, labour migration intensive growth: labour productivity growth
capital	interest rate	extensive growth: growth capital deals intensive growth: productivity growth of capital growth efficiency of investment
entrepreneurship	profit	extensive growth: growth in the number of entrepreneurs intensive growth: labour productivity growth of entrepreneurs

Source: own

From the text above, it is clear that the key for economic growth is to ensure that either more resources are available, or that the existing ones are used more efficiently. In the case of entrepreneurship, economic growth can be ensured by the growth of entrepreneurs' numbers, which is not only subject to demand and other influences shaping the business environment, but also by the presence of initiative or by the growth of entrepreneurs' labour productivity. This fact can be expressed by following equation

$$E = f(ELPxNE)^\beta \quad (1)$$

Where:

*E* = entrepreneurship as a production factor

*β* = coefficient of the business environment quality

*ELP* = entrepreneurs labour productivity

*NE* = number of entrepreneurs

*f* = function of entrepreneurship

The impact of the economic entrepreneurship growth factor depends on the entrepreneurs' numbers (NE) and the level of the entrepreneurs' labour productivity (ELP) The overall effect is also subject to the business environment quality, which is expressed by the coefficient (β).

In the case of the business environment, which acts on the decision for the business plans implementation negatively, the ratio reaches negative values. The result of the above mentioned is: if the educational reality is to fulfill its most basic function and prepare students for future occupation it is necessary:

- the students, after finishing their study, will be better asserted in society. However, a prerequisite is that the students should be equipped not only with professional knowledge and practical competence for the execution of a profession, but at the same time to be able to take advantage of this knowledge and expertise in employment and also in supporting their own business.
- the prerequisite is to pay attention to the education process in the areas that are related to labour productivity,
- for the use of the acquired knowledge and competence in the context of business activities, it is necessary for students to develop key character traits, in particular entrepreneurship.

The educational reality does not have a direct impact on the business environment, but it can help the individuals to have a better orientation in it and also to supply them with such competencies that will enable this orientation in the future. By the term 'competence' we don't understand only knowledge and skills, but also self-image and motives (Spencer, 1993) We also need to include character traits here, which are also largely involved in business intentions (Franke and Lühje, 2004). Key categories such as shyness and self-esteem (shame and self-confidence), vision, rationality, empathy and also honor, sincerity and credibility, are the character traits for the formation of entrepreneurship. (Iskandarini, 2014) Competences to do business can be understood as the ability to apply creativity in practical life and put into practical life new ideas (Bikse and Riemere, 2012) The educational process should therefore include experimental learning, problem solving and project-based learning (Jones and English, 2004), so that the pupils gain the necessary skills and are able to identify better the potential obstacles and also the factors that support their business (Schwarz, 2009). Studies show that changes in the unemployment rate significantly correlate with changes in the number of start-ups and it is not possible to clearly demonstrate that quantity is explanatory and explained in other words whether the higher unemployment rate leads to growth in the number of realized business plans or vice versa. However, this correlation is not so strong in the case of long-term unemployed people (Milošovičová a Stachová, 2016). It is clear from the above that in each case, entrepreneurship also requires the presence of the required competencies.

## **1 Analysis of school documentation**

The school environment together with the family environment is essential during the early stages of onto-genesis for the successful socialization of the individual. The personality of the

individual gradually takes shape in the process of maturing and learning. It is essential to build a solid foundation in the early stages that enables individuals to develop further. At the 1st level of primary school, an individual obtains basic knowledge and competencies such as reading, writing and counting. Entrepreneurship education as characteristic is therefore analyzed at the 2nd level of primary school. However, even in this case there is a need to support children in activity and efficiency. The need for incentives in children has been demonstrated in many studies. From a psychological and neuro-physiological perspective, this is a simple initiative whose answer is either reflexive action or reaction. But in this case, the practice is not fully active - the individual response is limited to the minimum level of activity. Therefore, in the case of the development of efficiency and enterprise in pupils, it is necessary to use activating stimuli that present a challenge for the individual to actively express and implement their abilities. If, in the case of simple incentive repeating itself, the organism will get used to these incentives and their stimulating effect declines. To avoid this, it is necessary to strengthen the incentive or modify it. However, in the case of the activating incentive it will not become a habit, because unlike the simple incentive there is a bilateral relationship between the activating incentive and the individual. If learning presents a mere acquisition of information, it acts as simple incentive. By contrast, if the learning means searching for the truth and a joyful permeation to the very basis of all matters, then this process is an active process and this exact one together with the receptiveness of the individual is a necessary condition for its improvement. Educational reality helps to shape the personality of the individual through educational activities. Specification of these activities is the basis of school documentation, which plays a key role in the school education program (SEP). For the purposes of this work, the SEPs of randomly selected elementary schools which provide the 2nd level of basic education were analyzed within the Moravian-Silesian region. Based on the analysis of these documents, it can be concluded that this material is processed quite extensively and in detail. The main part always presents curricula for individual subjects, which are further complemented by information related to the inclusion of cross-cutting issues, information about educational methods and strategies, etc. On one hand the analysis appears very clear declaration, that the school shall strive to ensure that the pupil's knowledge include practices (simple stimuli) and also should lead pupils to solve problems in practical life and motivates them to implement their own ideas (activating stimuli), but at the same time on the other hand, neither school has on its SEP the subject matter that would be substantively focused directly on business. This ambivalence, which comes from the absence of the primary educational process

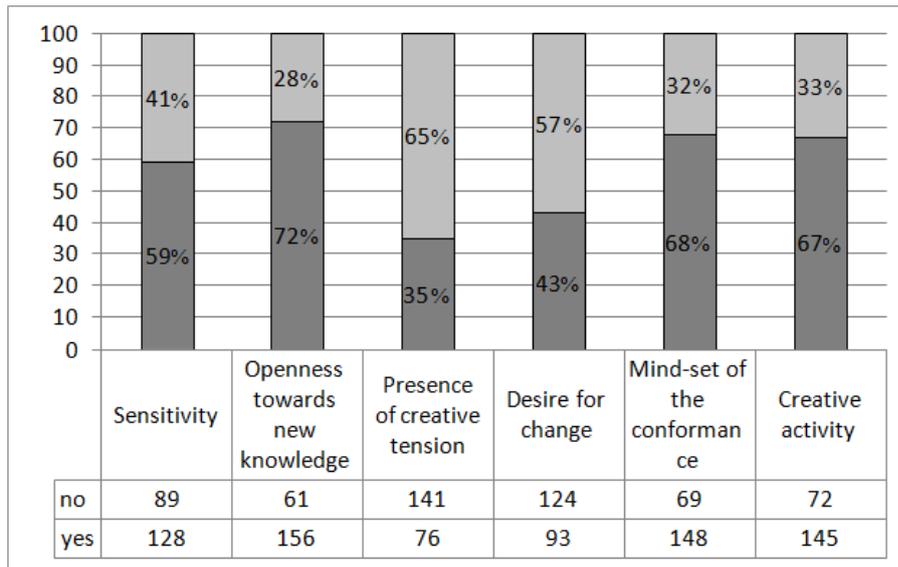
targeting the development of entrepreneurship, can present a certain deficit for unlocking business potential.

## **2 Analysis of the entrepreneurship of pupils of the 2<sup>nd</sup> level of primary school**

Domestic studies, which would be dealing in detail and in a coherent manner with the issue of profiling the personality of pupils following the acquisition of competencies needed for effective integration into working life, are few. Thesis is based on a research implemented during the last months of year 2016. The number of pupils who took part in the research was 217, of which 114 were boys and 103 were girls. For students who were in the last few years of primary school, which have the 2nd level and which were randomly selected for the purposes of this research, were recognized some characteristics crucial for doing business. Due to allegiance on the results of the research, the anonymity of the respondents as well as the schools was maintained. The diagnostic test battery contained two parts - a personality inventory and creative potential. The questionnaire of personal inventory included 90 items; Canadian psychologist P. Routier's questionnaire about creative potential contained 57 questions. The results are organized into 7 levels for the purpose of this research. The first unit was focused on the diagnostic sensitivity of pupils. On the basis of the self-evaluation of the pupils, it can be observed that over 41% of pupils performed a variety of tasks mechanically with their conscious attention focusing only on the important. However, most pupils (59%) are sensitive to details. The prevalence was slightly higher in the case of boys, and the differences between the group of boys and girls were tested with an analysis of variance and were statistically significant at level  $P < 0,05$ . Findings in the case of the dimension of openness towards new knowledge in the school context suggest that the educational processes to some extent lead to the development of the properties needed for the performance of the activities of the entrepreneur. Almost three quarters (72%) of those interviewed were showing openness to new knowledge as sufficient. It is not directly on the question of creativity (that was the main focus of the second part of the research) but rather on pupils' potential to be interested in wide range of issues. The rest of the pupils, i.e. 28% of the observed we can see a tendency to one-sided focus, which in extreme cases can lead to special-interest poverty. The prevalence of the liberal bias is slightly higher in the case of boys than girls, while the difference between the group of boys and girls was tested with the analysis of variance and were statistically significant at level of  $P < 0,05$ . The third dimension for the respondents examined the presence of creative tension. While 35% of pupils

do not need to creatively engage, the other 65% of pupils declare that their environment is ideal for creative activity. The results, in this case, can be marked as satisfactory, although in the case of education for entrepreneurship, it is likely that this may be a higher prevalence of creative tension. The ethiology of the pupils who are happy in the environment without changes, remains unexplained (this is the issue that has not been primarily included in this research. However, such an analysis could be a matter of future research). Let us add that the prevalence of the limited degree of creative tension in this case is more significant with girls, whose answers were to this outcome involved in 70%, with the gap between the group of boys and girls being tested with the analysis of variance, however, were not statistically significant. In the case of dimensions to ascertain to what extent the pupils found the desire for change which encourages creativity, was observed that only a limited number of respondents (43%) actively seek to change, while 57% of pupils prefer postponing the implementation of their ideas and thoughts to later time. The prevalence of the answer is in this case almost balanced, with differences between the group of boys and girls were tested with the analysis of variance, but the statistical significance of the ANOVA test at level  $P < 0,05$  wasn't proven. The mind-set of the conformance to the dimension values were recorded, which reveal that the majority of students (68%) accept thoughts which the external environment offers them. Only 32% of the pupils are not conformal. Intellectual conformity is an obstacle to creativity and innovation for entrepreneurial activity. A slightly larger degree of uniformity is observed in girls (63%), while the difference between the group of boys and girls was tested with the analysis of variance and were statistically significant at level of  $P < 0,05$  Creative activity presents another dimension. The investigation shows that 67% of pupils are in some way trying to manifest their creative activity, although it may not be dramatic appearance. For the other 33% prevails blocking of the creative activity. This may be the result of a lower degree of responsiveness to a wider area, the absence of creative tension, the mind-set of conformity or a well established procrastination realization of personal ideas. Prevalence is higher in the case of boys (69%), while the difference between a group of boys and girls was statistically significant at the level of  $P < 0,05$ .

**Fig. 1: The creative potential of 2<sup>nd</sup> level pupils at Primary school - absolute and relative numbers**



Source: own

The above chart summarizes the results in the area of the creative potential of the pupils. The top and colour-coded part of each column represents the reserve of creative potential in the form of the absolute number who shows lower scores in this area. The last examined dimension was focused on a personality inventory. A significant variability was found here, which is not surprising. Overall it can be summarized that in the framework of survey characteristics for pupils, there prevails a rather energetic personality oriented towards the achievement of targets, which also does not have a need to control others, does not have too much need for emotional proximity to others, and does not have the typical characteristics of a leader. Similar results are presented in other studies. There is quite a big success - orientation but in contrast, there is little orientation towards independence and willingness to take a risk (Ismail, 2015). The current generation of the new millennium is looking for ways how to achieve the greatest benefit with the least possible effort. It turns out however, that particularly in the case of owners of small and medium enterprises it shows that they are working more than 50 hours a week and throughout the year have only three weeks of vacation (Fernet, 2016) Therefore, any efforts aimed at reducing barriers (e.g. administrative agenda) would certainly welcome and potential entrepreneurs (Dvouletý and Mareš, 2016)

In addition and in order to strengthen the entrepreneurship of the young generation, it would be appropriate:

- in the monitoring of the results achieved in the process of teaching to take into account not only knowledge, but also the skills and competences acquired which are related to business,
- to analyze school educational programs and consider their modification towards the enrichment of articles focused on business,
- to develop the methodology of education and motivation for entrepreneurship and cooperation with the business sector,

there where we can appreciate more of pupil's originality, creativity, activity and other characteristics of the pupils which are related to entrepreneurship and do not perform an evaluation based on mechanically learned knowledge and practices.

## **Conclusion**

If the goal of the educational process is shaping pupils and their personalities then it is appropriate to monitor the achievement of these objectives by means of these criteria. We have available data about the creative potential and selected personality characteristics of a random sample of pupils at the 2nd level of the randomly selected elementary schools. This is a result of the educational work, which corresponds with the claims contained in the educational documentation only to a certain extent. It is not possible to reliably compare these findings with other research, because it is unique in our conditions. The findings of this research, however, can be seen as an impulse for further discussion on the seriousness of the topic of formation of the personality of the pupils towards developing entrepreneurship as the key feature of the individual in the economic system, for which is characteristic the market dominance under globalization and globalized with the emphasis on economic efficiency in the use of entrepreneurship as a factor of production.

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## DO MANAGEMENT INNOVATIONS YIELD IN HIGHER EMPLOYEES' SATISFACTION?

Kateřina Jiřinová – Lucie Vrbová

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### Abstract

**Purpose:** Aim of the paper is to answer the question in the title – Do management innovations yield in higher employees' satisfaction? Innovations are highly encouraged on the national level with government programmes as well as by EU through Operational Programmes. Management innovations are also called organisational or administrative. Management innovations are an implementation of new or significant changes in firm structure or management methods and they affect employees. Current management discussions stress the importance of employee satisfaction. Literature lacks empirical research of

**Design/methodology/approach:** Research is focused on the Czech Republic. Data were obtained from the Community Innovation Survey (CIS) which is harmonised survey of innovation activities in enterprises in EU. The survey is distributed by Czech Statistical Office. The response rate is 85%. The survey is longitudinal with two years' frequencies. Questions from 2004 and 2006 are the most appropriate to answer the research question. Effects of organisational innovation on employee satisfaction are tested using Kruskal-Wallis test with control on the size of enterprises.

**Findings:** Perceived effects of management (organisational) innovation on employee satisfaction are higher compared to the effects of marketing innovation. The effects are stronger with a combination of more types of innovation. The weakness of the findings is that the effects of innovations are only perceived effects based on self-evaluation of enterprises and the questionnaire does not allow indicating negative effects of innovations. But even so, these findings shed a light on the effects of management innovations perceived by enterprises.

**Research/practical implications:** The effects of management innovation are discussed in publications about management. But the relationship between management innovation and its effects lacks strong empirical evidence. The CIS brings great opportunity to investigate the relationship quantitatively. Findings are useful for managers that need to know the expected effects of their actions.

**Originality/value:** The main value of the paper is the range of data. It consists of surveys from two periods and the number of analysed enterprises that introduced an innovation is more than 5.5 thousand. It reveals effects of management innovations perceived by enterprises. Research of effects of management innovation is rare.

**Keywords:** Management innovations; Organisational innovations; Effects of innovations, Employees' satisfaction

**JEL Codes:** O39, M12

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## Introduction

Innovations are highly encouraged on the national level with government programmes as well as by EU through Operational Programmes. The term innovations cover a wide range of activities and topics. Oslo Manual distinguishes four types of innovations – product, process, marketing and organisational (OECD & Eurostat, 2005). These types of innovations are interconnected in the midterm horizon. Innovations of management are in close relationship with technological innovations, some authors even state that introduction of management innovations is often a prerequisite for the successful introduction of technological innovations (Damanpour, 2014). Birkinshaw and Goddard (2009) conclude that traditional management has come to its limits in the current world. The number of companies using alternative management models is rising.

The terminology is not united, management innovations are also called organisational, administrative, and managerial (Damanpour, 2014). Key detailed definition offers the Community Innovation Survey and Oslo Manual – *“the implementation of new or significant changes in firm structure or management methods that are intended to improve your firm’s use of knowledge, the quality of your goods and services, or the efficiency of workflows”*. Management innovations bring long-lasting advantage and produce dramatic shifts in competitive position (Hamel, 2006). Product and process innovations are easier to replicate than management innovations.

The unclear terminology and content of organisational innovations complicate their research (Lam, 2004). Management innovation is an under-researched topic (J. Birkinshaw, Hamel, & Mol, 2008). Upon few empirical research papers on management innovation, Mol and Birkinshaw (2009) found that *“the introduction of new management practices coincides with higher future performance in the form of productivity growth”*. Their research is based on CIS in the UK. Another CIS based research was performed in Norway and found that combination of organisational and technological innovation increase the effects (Sapprasert & Clausen, 2012). They also discovered that older and larger firms are more inclined to organisational innovation and smaller firms benefit more.

Employee satisfaction is one of the possible effects of innovation in the CIS study. Management innovation can lead to employee satisfaction and decrease employee turnover (Volberda, Van Den Bosch, & Heij, 2013). The aim of the contribution is to answer the question whether management innovations yield in higher employee satisfaction.

## 1 Data

Data were obtained from the Community Innovation Survey (CIS) which is harmonised survey of innovation activities in enterprises. Data are collected in many countries – EU member states and some other countries. CIS is a unique source in a worldwide perspective. There are no such data i.e. in the USA. The institution responsible for data collection in the Czech Republic is the Czech Statistical Office. The survey is longitudinal with two years' frequencies beginning in 2002.

Data in the Czech Republic were collected using a mix of census and sample survey – all enterprises with more than 250 employees were included and stratified sampling was used for enterprises with 10-255 employees (Czech Statistical Office, 2016). Enterprises with less than 10 employees were not included in the survey. The response rate was 85%. Data were collected either electronically or via mail; it was upon enterprises to choose.

Questions regarding organisational innovations and its effects are joined with marketing innovations. To indicate the application of organisational innovations, respondents were asked to mark specific forms of organisational innovations. The question was of yes/no type. The exact wording of the question and answers from 2006 survey are:

<b>During the three years 2004 to 2006, did your enterprise introduce:</b>	
<b>Organisational innovations</b>	New or significantly improved knowledge management systems to better use or exchange information, knowledge and skills within your enterprise
	A major change to the organisation of work within your enterprise, such as changes in the management structure or integrating different departments or activities
	New or significant changes in your relations with other firms or public institutions, such as through alliances, partnerships, outsourcing or sub-contracting
<b>Marketing innovations</b>	Significant changes to the design or packaging of a good or service (Exclude routine/seasonal changes such as clothing fashions)
	New or significantly changed sales or distribution methods, such as internet sales, franchising, direct sales or distribution licenses.

Source: Czech Statistical Office (2006)

The focus in the paper is paid to the first two types of organisational innovations. They are oriented inside the enterprise, towards employees. Other types of innovations from the survey are focused on outside of enterprises. For the purposes of the paper, enterprises were divided into 3 groups – 1) ORG – enterprises who introduced at least one of the first two organisational innovation and no other, 2) OTHER – enterprises who did not introduce one of the first two organisational innovation and did at least one of other innovations and 3) MORE

– enterprises who introduced at least one of the first two types of organisational innovations and at least one of other innovations.

Effects of innovation are subject of the following question. Enterprises evaluated the effects on a three-point scale (see below). The focus in the paper is paid to the last effect - improved employee satisfaction and/or reduced rates of employee turnover.

If your enterprise introduced an organisational innovation during the three years 2004 to 2006, how important were each of the following effects?					
		High	Medium	Low	Not Relevant
	Reduced time to respond to customer or supplier needs				
	Improved quality of your goods or services				
	Reduced costs per unit output				
	Improved employee satisfaction and/or reduced rates of employee turnover				

Source: Czech Statistical Office (2006)

The questionnaire has been changed several times during the period of CIS. For the research question, surveys from years 2004 and 2006 are the most appropriate. Newer surveys do not contain the questions. The researched topics are basic concepts that are not dynamically changing. The findings regarding management innovations from 2004 and 2006 are still actual and relevant.

### 1.1 Descriptive statistics

The dataset from 2004 and 2006 contains in total 6181 + 6716 record. One record in one year represents the response from one enterprise. For the analysis, the datasets were joined in one set. Responses in different time periods are independent. Enterprises evolve and change behaviour in time. The fact that an enterprise did organisational innovation in one year does not mean that it does the same the next year. The total number of records is then 12 897. It includes also enterprises that did no organisational or marketing innovation in the analysed period (7372 enterprises). The set of enterprises who introduced organisational or marketing innovations comprises of 5525 records. The set of records with no innovation and with an innovation differs in enterprise size. The set with innovation includes the higher proportion of large and medium enterprises compared to set with no innovation. This is with correspondence with Norwegian research (Sapprasert & Clausen, 2012).

**Tab. 1: Proportion of enterprises that did or did not innovation according to their size**

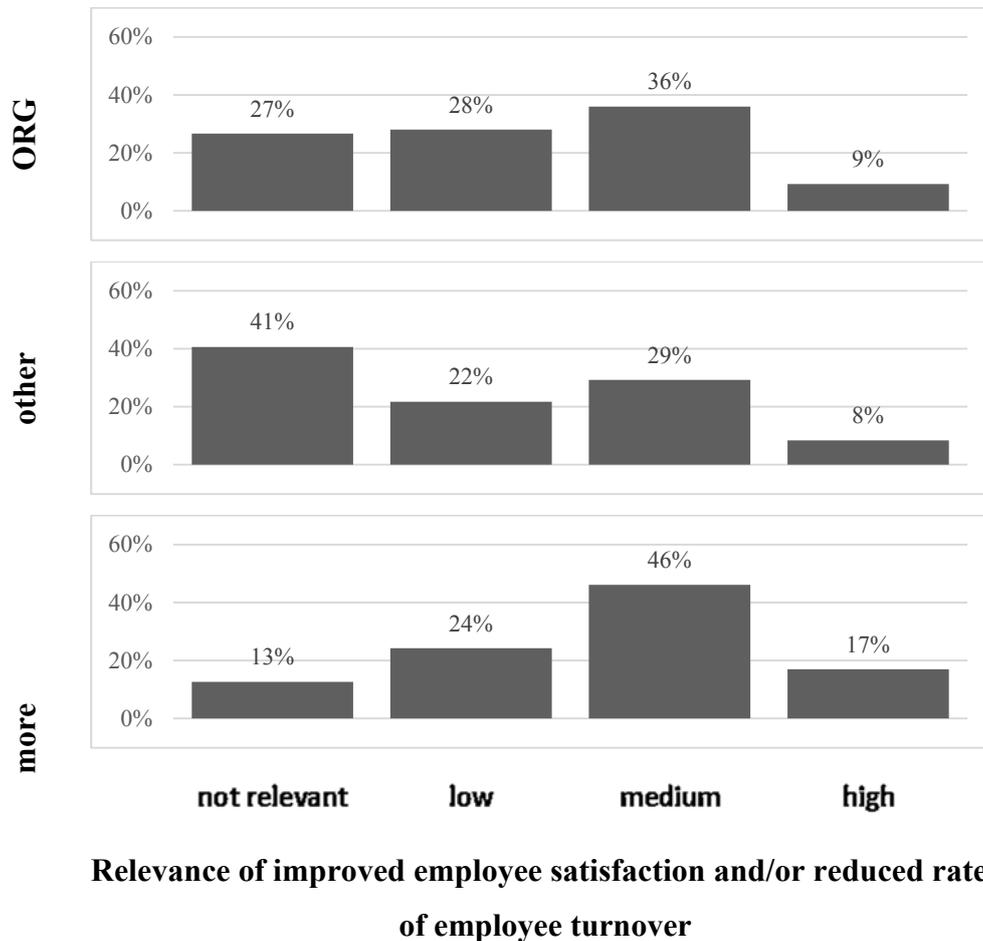
	Large	Medium	Small
No innovation	12%	26%	63%
Innovation	31%	31%	38%

The dataset includes enterprises from all regions of the Czech Republic (based on NUTS3). The distribution of enterprises between regions for the group with no innovation and group with innovation are close. The two groups differ in two regions - the capital city Prague and South Moravian Region where is the percentage of enterprises who introduced an innovation higher compared to those who did no innovation.

## 2 Results

The figure 1 presents the comparison of three groups of enterprises according to innovation introduced in the analysed time period. Frequencies of strengths of effect represent the proportion of companies in a group evaluating the effect of innovation on employee satisfaction. For example, 36% of enterprises that did organisational innovation perceive medium effect on employee satisfaction.

**Fig. 1: Frequencies of effect strength**



The effects of organisational innovation on employee satisfaction are visible and higher than for other innovation. Combination of more innovations increases the effects on employee satisfaction. The significance of difference is supported by Kruskal-Wallis ( $H = 574,38$   $DF = 3$   $P = 0,000$ ).

There are no significant differences in effects on employee satisfaction according to the size of enterprise ( $H = 2,82$   $DF = 2$   $P = 0,244$ ).

## Conclusion

To determine the relationship between the strength of organisational innovation on employee satisfaction, the enterprises were categorised into three groups. Enterprises who introduced organisational innovation and no other innovation reported higher effects on employee satisfaction compared to enterprises that did marketing innovation and no organisational innovation. These results indicate effects of organisational innovation on employee satisfaction.

The results of the analysis have certain limitations. Data are based on self-evaluation of enterprises. It affects responses on both sides of variables - management innovation and also its perceived effects. The definition of management innovation is not very strict and it's upon a subjective evaluation of enterprises. The perceived effects are measured on a scale which is ambiguous. The scale for effects is only positive; it is not possible to indicate negative effects of the innovation on employee satisfaction. The introduction of innovation and observation of the effects are limited to two year-time frames. It is possible that for some companies, the effects of organisational innovation come later.

On the other side, data from CIS are exceptional with a number of enterprises answering questions and its use in many different countries. The paper sheds a light on the topic of management innovation and its effects on employee satisfaction and brings some answers. Next research could be focused on other countries to determine the relationship between management innovations and effects on employee satisfaction.

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## CATEGORY MANAGEMENT IMPLEMENTATION IN THE RETAIL MARKET OF FAST-MOVING CONSUMER GOODS

Larisa M. Kapustina – Andrei A. Drevalov – Karolina M. Ilyenkova

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### Abstract

**Purpose:** The paper aims to evaluate the impact of the transition from the traditional model of assortment management to category management on the growth of turnover and profit of the retail chain. It proposes empirical assessment of the effects of the category management in a regional retail chain and testing the implementation of eight stages recommended by the European Customer Response System. The study aims to identify the stages of category management implementation in terms of the best satisfaction of customer needs.

**Design/methodology/approach:** The paper reflects the results of consulting project about category management implementation performed by the authors for a regional retail chain, comprised of 30 stores, 15 categories and 24,000 items of fast-moving consumer goods. The authors have tested the role analysis method for determining the composition, roles and strategies of product categories based on internal statistics of the retail chain “Plus” on sales volumes per month and retail markup for each product category for the years of 2015-2017. The analysis of category management implementation is based on the findings and the data collected from the interviews with the category managers.

**Findings:** The case study showed that the category management implementation resulted in the increase of profit. The implementation process was accompanied by restructuring of the company's organizational structure. It turned out that the most difficult part was the process of determining the composition of goods within a category based on the customers' preferences. The method of role analysis of categories proved its effectiveness in optimizing the roles of categories during the analyzed period. Future research studies are aimed at finding a methodology for selecting Category Captains in cooperation with manufacturers.

**Research/practical implications:** The implementation of category management relied on the stages suggested by the European Customer Response System. Six stages out of eight were carried out. It is required further elaboration of each stage. The results of the study and the suggested methodology can be applied to retail chains of various sizes and in different commodity markets.

**Originality/value:** The authors suggest strengthening the client-oriented approach to the developing the product categories. Thus, an additional stage is added to the classical scheme – developing a marketing plan in cooperation with the supplier on the basis of the 4P concept.

**Keywords:** category management, category manager, categories, retail trade, retail chain, assortment management

**JEL Codes:** M00, M31, L81

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### Retraction Notice

At the request of the authors, the following article has been retracted.

Kapustina, L. M., Drevalov, A. A., & Ilyenkova, K. M. (2017).  
Category Management Implementation in The Retail Market of Fast-moving Consumer Goods.  
Innovation Management, Entrepreneurship and Sustainability (IMES 2017), 379-389.

## Introduction

The main goal of category management as defined in the scientific literature is the maximum satisfaction of the customer needs and increase of the attractiveness of a retail chain for customers, which makes it possible to boost its sales and profitability (Nielsen, 1992, Dussart, 1998, Basuroy et al., 2001, Dewsnap & Hart, 2004, Sysoeva & Buzukova, 2010, Sapir, 2016, etc.). Category management has been applied widely in the retail trade in fast-moving consumer goods (FMCG) in Europe and the USA over the past three decades. However, it has spread among large retail chains in Russia only since the mid-2000s. The reason for the category management implementation in the developed countries was the growth of retail chains in the 1990s, as a result of which retailers have gained considerable market power (Ruchieva, 2015). The assortment management through product categories was first introduced by the American retail chain Schnucks in 1985 (Sysoeva & Buzukova, 2010). Procter & Gamble defined categories by product functions in the early 1990s, and the company is credited for the term “category management”.

Category management was first used in Russia by international retail chains: Auchan, Metro C&C, Obi, SPAR. The retail chains format has developed in Russia only in the last 10-15 years (Ruchieva, 2015). Category management implies the matrix structure of the organization, which means that it is necessary to coordinate major activities with the category manager, including the plans for purchases and sales, pricing strategy, and supply logistics (Kiselev & Nikolaeva, 2016). Based on information provided by the customer on the optimum sales, the supplier decides on the quantity of goods (Lukoszova & Polanecky, 2016). The category manager supervises a product category as an independent business unit (Nielsen, 1992). Jarvinen (2010) defined category management as a flexible organizational approach, allowing companies to focus the sellers' attention on the impact of each individual product on the category and its role in shaping the overall picture of profits.

Dussart (1998) sees the main task of category management in the customization of marketing as close to local buying patterns as possible. In this regard, category management allows retail chains to develop marketing activities in cooperation with the manufacturer in order to generate additional sales and reduce costs in the distribution channel.

The European Customer Response System (Europe E.C.R., 2000) defines category management as the cooperation of trading partners in order to determine the optimal pricing, promotion, trading space management and assortment management in the category to maximize profit and customer satisfaction. ECR Russia unites manufacturers and retail chains that use category management in sales management. The Russian management science has only few

researches devoted to the theory and practice of category management although the field has been developing for more than three decades abroad (Ruchieva, 2015). The conclusions of Dewsnap & Hart (2004) can be accepted: the category management as an approach to sales management has established as an independent field of scientific research.

The literature review allowed us to conclude that the category management includes the following points: the division of the entire assortment into product categories, primarily on the basis of psychological aspects of making the purchase; responsibility of one employee (category manager) of a trading company for the whole cycle of the category movement – from buying to selling; consideration of each product category as a mini-enterprise within the company with its budget, purchase policies, pricing, etc.; approach to the assortment of the store as a set of all categories - as the shop is perceived by the buyer.

## **1 Research problem and methodology**

ECR Europe (2000) recommends eight stages of category management implementation: 1) Category definition, 2) Category role, 3) Category assessment, 4) Category scorecard, 5) Category strategy, 6) Category tactics, 7) Plan implementation, 8) Reassessment of category.

The authors' aim is to analyze on the basis of the case study the practice of category management implementation by the retail chain in accordance with the classical stages of ECR Europe, to assess the effects and to propose a modified scheme for the transition to the concept of customer-oriented category management. The category roles are determined by the category manager in the case study based on the expert opinion resulting from the analysis of sales and the share of each category in the total sales.

The fast-moving consumer goods (FMCG) are purchased several times a week or a month, which requires the use of various methods of managing the large assortment. The peculiarities of the FMCG market include: high turnover of goods, steady demand, high price sensitivity, tough competition of retail stores, dynamic development. As a result, retail chains have to constantly update the product range, rotate brands, improve merchandising, set price discounts. In these conditions, retailers introduce modern assortment management technologies, category management being one of them. The authors define 5 product category roles: basic / purpose, current / routine, comfort, competence, seasonal. The main category strategies are identified in accordance with Snegirieva's approach (2011):

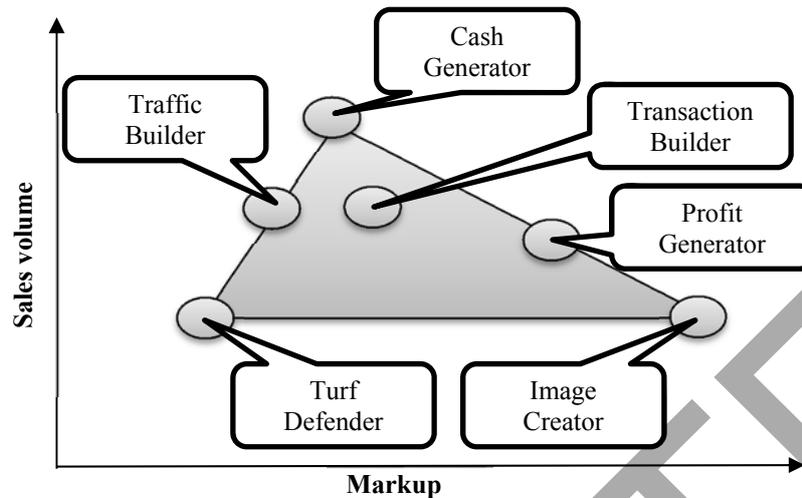
- Traffic Builder: known products with stable demand, representing a large share of the target market; provide massive flow of buyers.

- Cash Generator: known to most consumers and sold with small to medium markup; impulse goods.
- Profit Generator: high margin products, that have loyal customers; goods supported by advertising, new products with high sales rates.
- Turf Defender: product category defined by the price which aims at attracting price-sensitive buyers and make them loyal, not allowing them to go to competitors; improves the positive perception of the store.
- Transaction Builder: goods needed to make the average basket bigger, and increase the total physical sales volume of a store;
- Image Creator: expensive prestigious products used to attract attention and “ennoble” the atmosphere in the store.

The role analysis of categories method suggested by Snegirieva (2011) provides an opportunity to check if product categories are defined correctly. Two indicators are compared to determine the strategies: the sales revenue (Y axis) for each category in money and the markup in percent (X axis). The points of all categories define a geometric shape, when they are graphically connected in the coordinate system. If the figure is not a triangle, the six strategies cannot be defined, and it indicates that either the categories are identified incorrectly, or the retail markup should be changed for the products of some categories. The method helps to optimize the assortment by adjusting category roles and trade markups until all points on the chart form a triangle.

Then the area of the triangle is estimated. Changes in retail markup, inclusion of new products, and adjustments of roles – all the changes that result in the increase of the area ensures the assortment rotation and also show that the growth in turnover and profit is attributed to the optimization of retail categories of goods. Alongside with that, the method allows managers to determine the goods that should be excluded from the product range – these are the goods from the lower left corner of the triangle.

Based on the data obtained, a “Triangle” graph is drawn up, and a strategy is assigned to each category (Figure 1).

**Fig. 1: Definition of strategies in the “sales volume – markup” framework**


Source: Snegirieva (2011)

This approach was tested in the Russian FMCG market and specifically the retail chain “Plus”, which has 30 shops in the Ural Federal District and the Perm Krai (neighboring region) of the Russian Federation. The company provided monthly data on the retail markups and sales volumes of goods for two-years period of time. The study involved 15 product categories, 24,000 product names. Case study was based on a comparison of two periods in the retail chain operation: the period of traditional product management from May 1, 2015 to January 31, 2016; and the period of category management implementation from May 1, 2016 to January 31, 2017. At the time of the launch of the study, the “Plus” retail chain was an example of traditional retail trade, sales efficiency was low, and the outflow of customers began as a result of the crisis. The crisis period has begun in 2015 due to the sanctions and devaluation of the Russian ruble and continues in 2017 as the statistics of Russia's retail trade show stagnation for the third year consecutively. The process of category management implementation lasted for a sufficient period of time to allow the initial evaluation of the effects resulting from category management implementation.

## 2 Evaluation of the category management implementation effects in the retail chain

The existing classification of product categories and sub-categories has been completely changed during the project implementation. The roles of categories were identified on the basis of the analysis of sales. As a result, the company's turnover increased by 16.8 %, the profit

increased by 16.3 %, most categories showed positive dynamics due to optimization of all business processes and application of category management (Table 1).

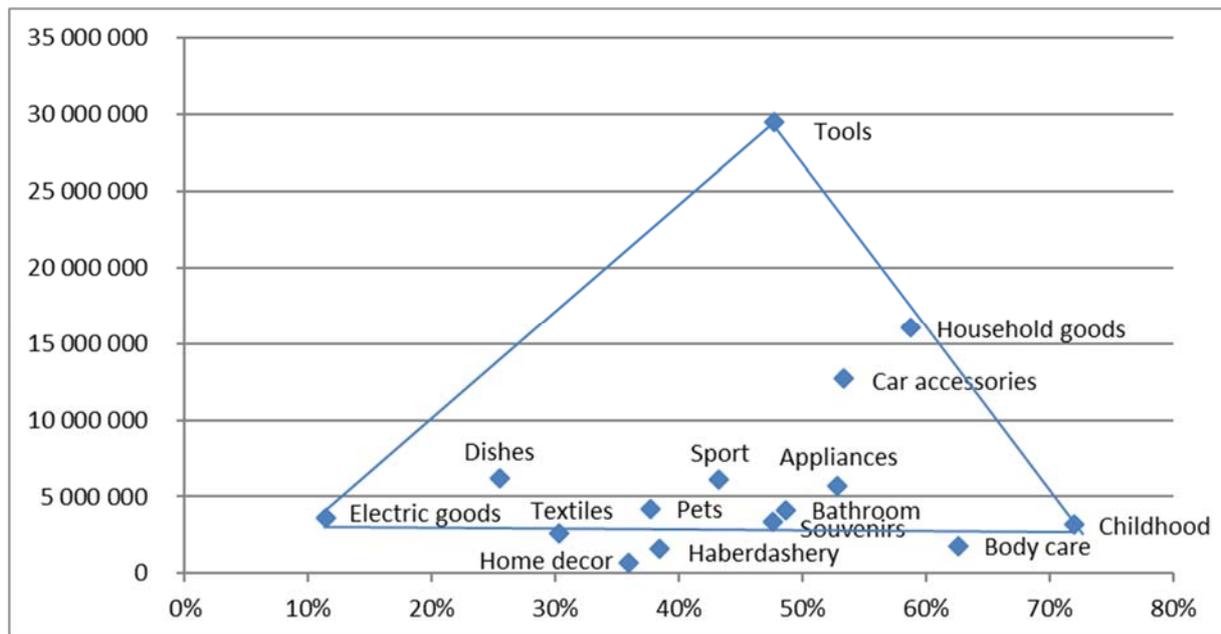
**Tab. 1: Comparative analysis of sales by product category for the periods before and after category management implementation (01/05/16-31/01/17 and 01/05/15-31/01/16)**

Product Category	Retail Markup, %	Category Role	Rate of increase after category management implementation, %	
			Sales	Profit
Souvenirs	65	Comfort	-40,7	-58,3
Appliances	36	Comfort	-21,2	-30,3
Car accessories	48	Comfort	-9,7	-10,3
Bathroom fitment	37	Comfort	-9,4	-10,6
Tools	48	Comfort	-4,5	-3,2
Goods for pets	18	Routine	7,2	-28,7
Haberdashery	58	Seasonal	10,8	4,7
Household goods	53	Base	11,9	19,3
Dishes	43	Base	15,0	23,0
Sport and recreation	50	Seasonal	21,9	0,5
Electrical goods	50	Comfort	25,5	45,6
Children's goods	56	Routine	27,1	22,6
Body care	32	Comfort	37,0	136,5
Home decor	50	Seasonal	70,4	53,8
Textiles	42	Routine	126,0	55,4
Total	47		16,8	16,3

Source: Authors' own calculations, data collected from the company.

The table suggests that 5 categories out of 15 showed negative results. The goods of several categories were purchased from the current supplier during the whole period. The company's owners were focused on this supplier. The peculiarity of doing business in Russia is the great role of personal ties. For other categories that showed positive dynamics, the purchase of the goods was fully or partially transferred to new suppliers, the range was updated, marketing activities were actively carried out. Based on the results of all planned activities, the geometric figure, built on the basis of available internal sales statistics by category, has acquired a form of the triangle, categories - more clear strategies (Figure 2).

**Fig. 2: Strategic analysis of product categories for the period of category management implementation in terms of sales and retail markup**



Source: Authors' own calculations, data on sales and retail markups collected from the company

The strategies for product categories were defined: Profit Generator – household goods; Cash Generator – tools, Transaction Generator – car accessories, Defender – electrical goods, dishes, textiles, haberdashery, home decoration, pet products, sport goods; Image Creator – products for children, body care, appliances, souvenirs. The “Household goods” category was planned to be assigned to the “Flow Generator” strategy, however it could not be achieved due to shortage of labor resources. Depending on the strategy, several parameters were changed: the pricing (retail markup), merchandising, promotion.

### 3 Practical implications and findings

Tactical actions were determined for the further development of product categories, increasing their efficiency and demand from customers. These included the following activities: the required number of titles in each category and format was defined; equipment was redistributed between categories in each individual store; the planned mark-ups for each separate category are determined; monthly marketing activities were planned. The purchase of goods was centralized (previously each store ordered goods on the basis of the opinion of a product expert), the exact number of shelves for each category in each separate store was determined, all 30 stores were transferred to 5 categories, 65 % of the main assortment was worked out, commercial conditions were improved under supply contracts, the prices for the current

assortment were reduced, the shelf space between categories was redistributed, planograms were developed, and sales promotion actions were launched at points of sale.

Sapir (2016) conducted a desk research to analyze the implementation of category management in the Russian FMCG market by Danone, Arla Foods, Unilever, Procter&Gamble, Nestle, Bacardi in 7 large Russian retail chains. As concluded in his study, the classical model for implementing category management as suggested by ECR Europe was implemented only by Danone and the Russian retailer Lenta. Only two out of the eight classic stages are actually implemented: category definition based on consumer segmentation and also tactics definition when the assortment is specified, and the supplier develops specialized commercial equipment for product category placement and display. In the current case research, three of eight classical stage: 3, 4, and 5 – have actually been combined into one stage of category strategy development. As a result, six out of eight stages are implemented by the retail chain.

The effects of category management implementation in Russian retail trade has shown that manufacturers and retailers pursue short-term category development goals. At the same time, empirical studies confirm large cumulative impact of category management implementation: the category management adopter's profits are greater than those of a symmetric competing retailer that follows the traditional brand-centered management of a product category (Hamister & Fortsch, 2016).

The retail business in Russia focuses expansion path development, and customer orientation and satisfaction of the needs is becoming a priority task. As usual, retailer aims to extract the distribution chain continued profitability in the long term by managing customer value (Sharafutdinova et al., 2016). Therefore, a client-oriented approach was applied in the process of category management implementation, and the marketing unit in the retailer's activity was expanded. The category management implementation was conducted according to a modified scheme, slightly different from the stages recommended by the ECR Europe.

As shown by the study, the retail chain has carried out the following stages of category management implementation: Definition of categories, Definition of roles, Definition of Strategy, Definitions of tactics and marketing activity on the basis of 4P concept, Analysis of the results, Reassessment of categories.

Based on the observations from both the case of Russian retail chain and literature review, the study summarizes the key actions in category management: definition of categories, space allocation of goods and the use of marketing promotion; and concludes that category management practices have positive impact on the performance of retailers. The study has identified that in order to implement the concepts of category management successfully, a retail

chain should be ready for organizational changes, including the delegation of the required authority to the category manager.

## Conclusion

In general, the classical model of category management implementation based on the recommendations of ECR Europe showed its applicability in the Russian market of FMCG – six out of eight stages were implemented. In comparison with the classical model, it was possible to propose a client-oriented model of category management implementation by applying the 4P marketing strategy. The most difficult part of the implementing process was to carry out the organizational changes in the system of sales management and assortment management in the retail chain. The functions of goods purchase were centralized for all the stores of the retail chain, but issues arose from the attempt to change the suppliers with which the management of the retail chain had established personal relationship. The case study has proven that a retail operator plays a key role in determining the categories based on consumer preferences. Determining the composition and the boundaries of a product category turned out to be not a trivial task. Therefore, the roles of individual categories and inclusion of a number of goods in them were revised a few times during the year, using the role analysis method.

The empirical testing of the role analysis method showed its effectiveness for determining category strategies and assortment management based on the profit maximization criterion. It can be applied to retail chains in different commodity markets. The project allowed the company to establish mutually beneficial partnership with a group of suppliers and conduct marketing activities jointly to promote goods in the retail chain. Further research involves improving cooperation with suppliers of goods on all the aspects of product distribution, selection of category captains and joint management of logistics and marketing.

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## **RISK IN THE INTERNATIONALISATION OF SMALL AND MEDIUM-SIZED ENTERPRISES – SELECTED ASPECTS**

**Witold Kasperkowiak – Joanna Malecka – Teresa Łuczka**

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### **Abstract**

**Purpose:** Risk is an ambiguous and complex term relating to material and immaterial things. The process of internationalisation of enterprises affects their competitiveness by enhancing their development potential. Nevertheless, this process is associated with numerous types of risk that are not present in the domestic market. The purpose of this paper is to present the views of active and potential entrepreneurs on the risks related to SME internationalisation processes, their preferences with regard to the forms, inclination to take a risk and select specific models of internationalisation, including taxonomy of risk types.

**Design/methodology/approach:** The presented findings are based on an analysis of responses received in a group administered questionnaire from 317 respondents who represent various industries in Wielkopolska – the third region in Poland in terms of entrepreneurship – and showed willingness to enhance their economic education. The respondents pursued their activity abroad based on various forms of internationalisation. The survey covered risk and its perception by the respondents in the aspect of internationalisation.

**Findings:** Despite the prevalence of risk associated with the internationalisation of small and medium-sized enterprises, the majority of the respondents note the need to get involved in this process and perceive it as an opportunity as well as the right direction for enterprise development. The stage model of internationalisation and cooperation-based forms are preferred. Representatives of born globals are less likely to consider pursuing activity abroad as risky, indicating a relationship between risk and the size of the company. In the opinion of the respondents, entrepreneurs operating in external markets are more open to take a risk than those who pursue their activities in the internal market.

**Research:** Studies have shown high awareness of the risks associated with the internationalisation processes among the respondents. Favouring cooperation-based forms of internationalisation, the respondents pointed out the lack of suitable business partners abroad as one of the threats and indicated the need to strengthen programs supporting SMEs in Poland, including the association of business partners.

**Originality:** This paper analyses the risks associated with the internationalisation of small and medium-sized enterprises. The perception of the complexity of this issue and of correlations between the barriers in the internationalisation process and the size of the enterprise is reflected in the findings of the authors' own research presented in the paper. The impact of risks on the SME internationalisation process is a recognised issue, but not fully analysed in the related literature.

**Keywords:** risk taking, exports and imports, international trade, internationalisation, SME

**JEL Codes:** D81, F13, F14, M16, L25

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## **Introduction**

Risk is a complex and ambiguous term. Considering the genesis and universality of this term as well as the unquestionable impact of the human factor, it can be assumed that risk is also a primary notion that evolves over time. The earliest definitions of risk can be found in F.H. Knight's papers, who described it as acceptable deviations from the expected value, defined using the probability theory (F.H. Knight, 1933, pp. 19–20). B. Brühwiler interprets these deviations one-sidedly, calling them clearly negative (Brühwiler, 1980, p. 40). In recent years, however, researchers have seen the benefits that the deviation from the expected value may bring – risk is then perceived as an opportunity. In the related literature, risk defined as such is termed speculative risk (Krupa, 2002, p. 16). Business management should consist not only in mitigating risk and its effects, but also it is giving it a form of usefulness, thus turning it into a phenomenon that is positive or at least non-prejudicial to the economic activity. Then, the risk perceived as an opportunity can become an impulse to a more effective entrepreneurship.

Entrepreneurs' behaviours in the presence of risks depend on the type of their activity and experience. This applies to all economic operators, but especially to those belonging to the group of small and medium-sized enterprises where the owner plays a key role. In this aspect, it becomes very important for the owner to properly recognise the largest possible number of risks and to manage them efficiently. On-going management of an enterprise makes it possible to gradually recognise risks and, consequently, to manage them more capably. One of the ways to increase the value of an enterprise is to expand sales markets, for example through the implementation of internationalisation processes. In such a case, the risk embodies not only an opportunity to generate higher revenues but also the odds of failure, particularly in the first phase of activity. There is no clear answer to the question whether the opportunities afforded by these processes are of the same magnitude as the threats. As companies expand their activities, new challenges and problems arise, and so do new barriers and other risk factors (Stawasz & Ropęga, 2014, p. 100). The internationalisation of an enterprise is often the biggest challenge that defines the growth and development of the organisation. Until the 1970s, SMEs were marginalised in related research, and were viewed as exclusively local activity or assigned the role of subcontractors for large and transnational companies (Daszkiewicz & Wach, 2013, p. 50). Since then, there has been a strong growth in the number of SMEs in the international environment and in their importance in foreign trade, as corroborated by studies that emphasise the rapid pace of this process (Łuczka, 2002, pp. 277–290). From the point of view of this paper, the analysis of the relevant literature on the role of an owner-manager of the enterprise in the SME sector is aimed at identifying the impact and importance of the human factor in

understanding and managing risks in the enterprise internationalisation processes by active and potential entrepreneurs. The analysis covered the determinants of perception and initiation of attitudes supporting the enterprise internationalisation process.

## **1 Sources of risk in the internationalisation of enterprises**

The related literature provides numerous definitions of enterprise internationalisation, and their descriptions are not fully consistent. According to the dictionary definition, this phenomenon stands for the growing tendency of corporations to operate across national boundaries (Business Dictionary, 28 February 2017). The definition by J. Rymarczyk is more universal and sees internationalisation as "any kind of economic activity undertaken by an enterprise abroad", and this applies to enterprises of all sizes (Rymarczyk, 2004, p. 19).

Internationalisation is an opportunity for enterprises to develop and increase their value. It is typically a venture with higher exposure to the risk of failure compared to purely domestic activity, which is primarily due to the need to acquire additional knowledge of a new environment. The definition that particularly aptly refers to the internationalisation processes seems to be the one given by E. Kreim, according to which risk is a process of making decisions that are not optimal from the point of view of stated objective due to the possession of incomplete information (Kreim, 1998, p. 45). R. Hölscher takes a similar view, calling risk a threat of failure to achieve the intended profit due to incomplete information (Hölscher, 1987, pp. 17–36). The terms most commonly used in the quoted definitions concern certainty or lack of certainty, threat of failure, and decision-making with incomplete knowledge. This, therefore, confirms the interpenetrating external and internal sources of risk.

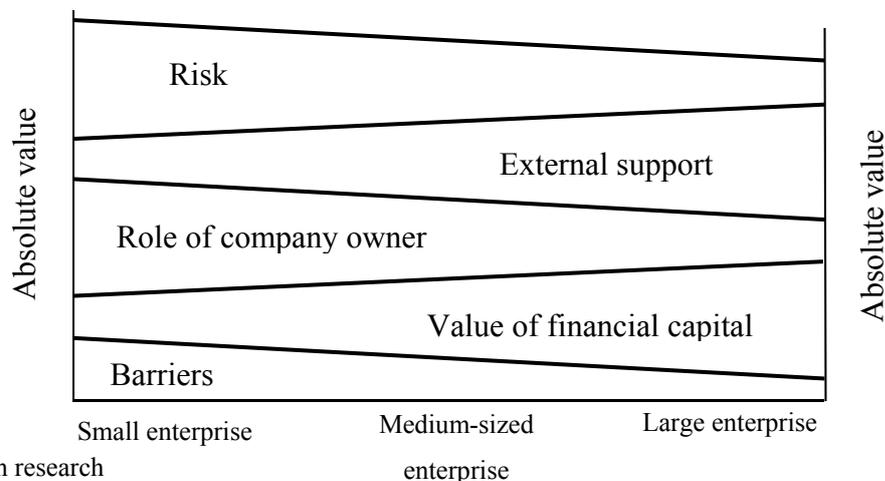
### **1.1 Barriers to SME development in foreign markets**

The related literature provides a number of classifications of barriers to the development of small and medium-sized enterprises, which identify the constraints inhibiting the growth of the company. The literature defines the barriers to the entry and development of the enterprise, and the barriers related to subsequent stages of SME's life (Łuczka, 2002, pp. 277–290). The main factors restricting the activities of SMEs are then: management, resources, and conditions and market structure. A division associated with the life cycle of the enterprise allows for seeing the barriers related to the process of internationalisation as a key stage in the life and development of companies. The main barriers to the growth of SMEs, which are typically headed single-handedly by the owner (CEO, manager), are the management barriers (PARP, 2016, pp. 124–

130). They comprise planning systems, organisational structures, human resources development, and control systems.

In the aspect of internationalisation processes, the size of the enterprise determines the inversely proportional relationship between the number of barriers associated with additional risk, the need to involve the owner, the possibility to obtain external support, and the value of the enterprise's capital (Fig. 1). Barriers directly affect the development of enterprises in foreign markets, and the entrepreneur's goal should be to discern, eliminate, or alleviate them.

**Fig. 1: Relationship between company size and business environment conditions**



Source: Authors' own research

The analysis of barriers in the process of internationalisation listed in the related literature was a starting point for distinguishing the 10 most important barriers in SMEs (Tab. 1). Worthy of note is the difference in the assessment of significance of the barriers indicated by both groups. Entrepreneurs focused on business opportunities and the problems of their funding (Tab. 1, symbols: A and B), underestimating what is a major obstacle in experts' opinion – inadequate quantity of and/or untrained staff for internationalisation (Tab. 1, symbols: G & A). Findings of other studies confirm that entrepreneurs pay less attention to internal conditions. This may indicate that entrepreneurs fail to see the management barriers or ignore them. This may involve difficulties in putting together a team of appropriately qualified employees or relate to the financial condition of SMEs (Łuczka, 2002, pp. 277–290; Małecka, 2016, pp. 91–122). Moreover, familiarity with foreign business practices and exporting procedures is missing on the list of the most important determinants given by entrepreneurs.

**Tab. 1: Barriers to SME internationalisation**

Barriers		Ranking by entrepreneurs	Ranking by experts
Symbol	Description		
A	Shortage of working capital to finance exports	1	2
B	Identifying foreign business opportunities	2	4
C	Limited information to locate/analyse markets	3	3
D	Inability to contact potential overseas customers	4	6
E	Obtaining reliable foreign representation	5	
F	Lack of managerial time to deal with internationalisation	6	5
G	Inadequate quantity of and/or untrained personnel for internationalisation	7	1
H	Difficulty in matching competitors' prices	8	
I	Lack of home government assistance/incentives	9	
J	Excessive transportation costs	10	
K	Developing new products for foreign markets		7
L	Unfamiliar foreign business practices		8
M	Unfamiliar exporting procedures/paperwork		9
N	Meeting export product quality/standards/specifications		10

Source: (OECD – APEC, 2009, p. 8)

Awareness and proper identification of risks are crucial in risk management in an enterprise. Amid all the difficulties, for a company that intends to embark on the internationalisation process, unfamiliarity with the market is the biggest critical constraint, and the owner-manager is a key figure throughout the process.

## 1.2 Models of risk taxonomy

This paper aims to identify the complexity of the process of risk identification during the internationalisation of enterprises. The relevant literature offers a number of classifications of threats associated with the activities of enterprises (Tab. 2).

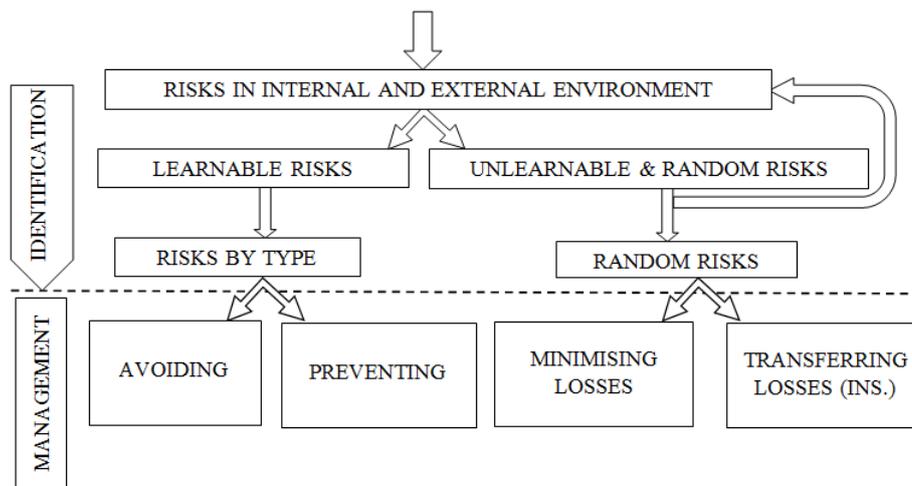
**Tab. 2: Summary of selected classifications of risks associated with the activities of enterprises**

Classification of risks	Representatives
1) invariable (constant), related to the economy at a macroeconomic level 2) variable (inconstant), related to the activities of the enterprise	N. Skov (1991)
1) systematic (non-diversifiable) 2) unsystematic (diversifiable)	Z. Wilimowska (1998)
1) learnable 2) unlearnable (random)	D. Apgar (2008)
1) primary (unavoidable) 2) secondary (avoidable)	G. Crawford, B. Sen (1998)

Source: Authors' own elaboration

Other researchers provide a more detailed classification of risks, taking into account the source of their creation. It seems that in the aspect of enterprise internationalisation processes it is impossible to identify a universal criterion that would be useful in each of the processes, from beginning to end. It may prove useful, using the feedback between the internal and external environment of the company, to initially adopt a variable division into unlearnable (random) and learnable risks. At the next stage, a detailed diversification and identification of learnable risks can be applied to manage them and, at the same time, to protect the enterprise against losses arising from random risks, e.g. the consequences of force majeure (Fig. 2).

**Fig. 2: An example of a pathway for identifying and classifying risks in the internationalisation process**



Source: Authors' own research

The identification of all risks is impossible in practice, for example owing to their variable nature. Hence, it is just as important to eliminate risks as it is for entrepreneurs to have

skills – better than the competitors’ – to aptly assess risks, and to ensure that the quality of the assessment has a real impact on the results achieved. Otherwise, profits may never be proportional to the risk the entrepreneurs take. In this aspect, the proper identification of risks and appropriate recognition of the problem allow for using right tools to solve it; the skills and attitudes of the manager are of key importance, which is one of the determinants of the SME sector. The proper definition of the perceived risks makes it possible to manage them efficiently.

## **2 The role of entrepreneur in the internationalisation process**

Managers who want to ensure growth to their enterprises in foreign markets, all while increasing the existing wealth, should capably acquire knowledge of other economies and effectively identify the risks occurring there. Knowledge is a strategic resource, determining the operation and development; also, it provides managers with answers to the question about the purpose and direction of the enterprise’s activities. In a rapidly evolving economic environment, the time required to obtain information is reduced to the minimum, which forces managers to make decisions based on their present knowledge within a massive lack of knowledge of the whole internationalisation process (Figueira-de-Lemos et al., 2011, p. 143). This is indicative of the multitude of information that managers should acquire with regard to the fast pace of internationalisation of modern enterprises. Also, this supports the claim that entrepreneurs are inclined not only to take specific risks, but also to engage in situations of a risky nature.

The relevant literature classifies the motives for enterprise internationalisation, with a prevailing assumption that the enterprise internationalisation process is closely related to the entrepreneurial attitudes of their owners (Daszkiewicz & Wach, 2013, pp. 36–39; Rymarczyk, 2004, pp. 57–73). Their knowledge and experience are the enterprise’s most important resource. This reasoning serves as a basis for the resource-sector models. These models attribute a key role to the company owner in the process of internationalisation. This process requires high managerial competence and skills, as well as the knowledge of business analysis tools. The internationalisation process is also determined by SME managers with limited knowledge of economics and risks, who – lacking the required qualifications to prepare analyses in this regard – are forced to use the services of consulting firms. The SME environment encounters numerous barriers, also to keeping pace with innovations, market trends, and development tendencies of global competitors (Vătămănescu, 2014, p. 58). Empirical research indicates that enterprise internationalisation processes are generally carried out progressively, with clearly distinct phases that differ in the degree of accepted risk. This attests the company owners’ striving to minimise the risks associated with the internationalisation processes by selecting such a form

of entry into foreign markets that allows them to do it. The significance of the manager's role in the process of internationalisation of enterprises has been extensively researched. The findings on the SME sector indicate that numerous enterprises make a strategic decision to employ a manager from outside the family, recognising the importance of his/her experience and ability to enter foreign markets – e.g. the knowledge of business practices, languages, marketing strategies and export procedures (Benavides-Velasco et al., 2013, pp. 41–57). This testifies to the maturity of the SME owner who – in the face of his/her own incompetence – decides to partially hand over the reins to an external, professional and competent manager, thereby enabling the enterprise to develop further. Research results show that in the case of unilaterally controlled companies (where the family holds more than 50% of shares) family members may have a negative impact on internationalisation strategies, which may increase the risk of this process (D'Angelo et al., 2016, pp. 534–547). Foreign market activity requires special knowledge and management skills due to the complexity of the whole process and the presence of issues entailing heightened risk. In summary, internationalisation, even in a relatively simple form, calls for specialised and professional management staff.

### **3 Risks associated with internationalisation in the light of empirical research**

#### **3.1 Description of research method and sample**

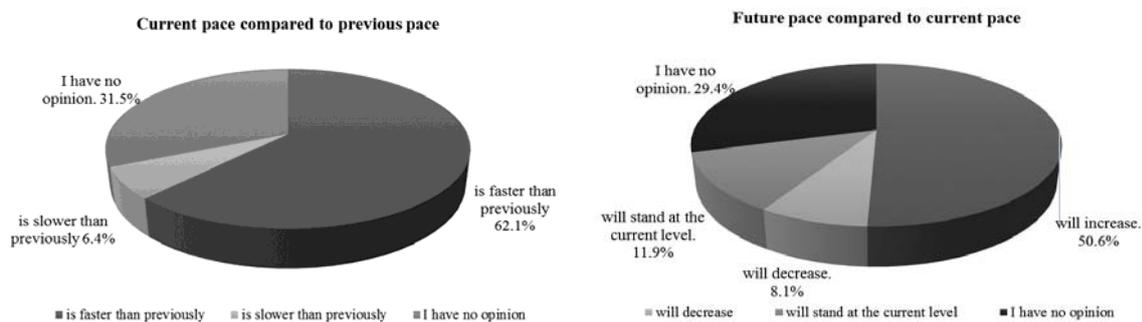
The survey covered 158 women and 159 men aged 19–28 who were active in the Wielkopolska region. The respondents represented various industries and pursued commercial or service activities on foreign markets based on varied forms of internationalisation. A total of 317 completed questionnaires was received. The survey was conducted using a group administered questionnaire. Not all respondents answered all posed questions; hence the sample size varies in the respective criteria analysed. The sample size is limited; nevertheless, it provides the basis for identifying the perception of internationalisation (in particular its barriers) by the respondents in the Wielkopolska region against the backdrop of research covering entire Poland (Table 1), and for determining the preferred forms of international cooperation.

#### **3.2 Opinions on the pace of internationalisation processes of companies and the role of their owners**

With reference to the challenges related to the need to gather knowledge of foreign markets, the respondents were asked about their views on the current and future pace of internationalisation

processes. Most respondents (62.1%) stated that the current pace of company internationalisation is faster than before, and 6.4% of the respondents disagreed with this opinion. 31.5% of the respondents did not have an opinion on this issue (Fig. 3). Women accounted for 65% of the persons who pointed to the present slowdown in the pace of internationalisation. A high percentage of opinions of undecided persons may be determined by the young age of the respondents and their level of knowledge of enterprise internationalisation.

**Fig. 3: Respondents' opinions on the current and future pace of internationalisation processes**



Source: Authors' own research based on the group administered questionnaire 2017 (n=314)

In response to the question about the future pace of internationalisation, more than a half of the respondents (50.6%) concluded that it would grow in the future. Only 8.1% of the surveyed persons held an opposite view, with males accounting for 60% of this group. An opinion that the pace of internationalisation will stand at the current level was expressed by 11.9% of the respondents. 29.4% of the respondents had no opinion on this issue (Fig. 3). This means that the majority of the respondents perceive internationalisation as an opportunity and recognise it as the right direction for the development of the company. On the other hand, such results confirm the thesis about a challenge for managers, who are tasked with acquiring knowledge of foreign markets and identifying the risks occurring in these markets.

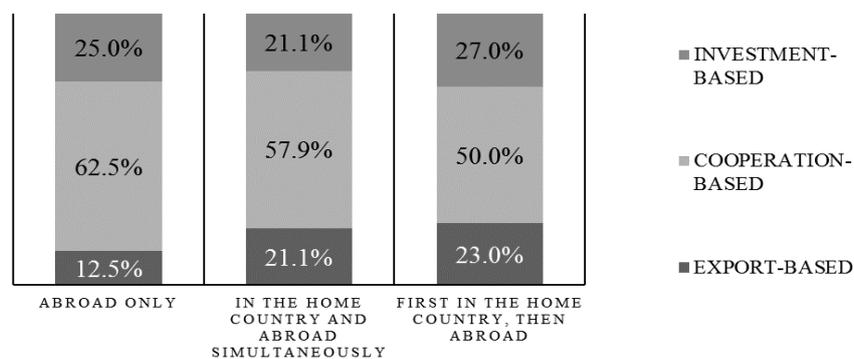
Starting and pursuing an activity in a foreign market poses a big challenge for the companies from the SME sector, particularly for their owners, because of the need to make decisions in uncertain situations. This is corroborated by the results of the conducted surveys. 59.5% of the respondents considered that entrepreneurs operating in foreign markets were more inclined to take a risk than the entrepreneurs who carry out an activity in the local market only. 17.1% of the respondents disagreed with this claim, and 23.4% of the respondents had no opinion on this issue. The survey results confirm the assumptions put forth in the literature and

indicate the importance of the company owner-manager in the implementation of SME internationalisation processes.

### 3.3 Impact of risk on the selection of the form of internationalisation

The results of the survey showed that 88.1% of the respondents who expressed the intention to operate in foreign markets preferred the stage model of internationalisation, choosing to start their business first in Poland, and then abroad. In the rest of the group, 8.5% of the respondents would opted to start an activity simultaneously in Poland and abroad. Only a small number of respondents (3.4%) expressed the intention to launch a business solely abroad. The results of the survey demonstrate a high awareness of the risks linked to the internationalisation processes among the respondents and the strive to minimise the threats. The surveyed persons are of the opinion that the cooperation-based forms – contracts with foreign companies, subcontracting, licensing, and franchise – dominate in all the selected models, despite a significant superiority of stage models. In each of the models, these forms were opted for by at least a half of the respondents. Export-based forms – direct and indirect exports, and investment-based forms – daughter companies and joint ventures, were less frequently chosen by the respondents (Fig. 4).

**Fig. 4: Respondents' preferences regarding the selection of the form of internationalisation in view of the model of activity abroad**



Source: Authors' research based on the group administered questionnaire 2017 (n=196)

The results of the survey show a difference between the choice of stage models and the rejection of export-based forms in favour of cooperation-based forms. This may indicate greater freedom of establishment and free movement of services in foreign markets without the need to register companies there. However, this may just as well show a lack of independence of an SME entrepreneur, an entrepreneur's concerns about an excessive risk of making independent

decisions about the expansion, and perhaps even a lack of linguistic competence that enables acting independently. However, this is a complex issue that requires further in-depth research.

### **3.4 Determinants of SME internationalisation**

In the opinion of the respondents, the biggest obstacle to the internationalisation of SMEs is the lack of capital for financing exports, which was also confirmed in the OECD report and named the most important growth barrier among entrepreneurs (Tab. 1 & 3, symbol A, no. 1 in the ranking), although in the experts' opinion the biggest barrier is staff (Tab. 1, symbol G, no. 1 in the ranking). In turn, the inadequate number of qualified staff or unqualified personnel for the implementation of internationalisation processes is moderately important in the respondents' view (Tab. 1 & 3, symbol G, nos. 7 & 5 in the ranking, respectively). This may indicate that entrepreneurs and respondents downplay the importance of the human factor in the internationalisation process, or that the significance of qualifications is underestimated throughout the process. According to the respondents, subsequent major barriers concerned obtaining a reliable foreign representation and a lack of home government assistance/incentives (Tab. 3, symbols E & I, nos. 2 & 3, respectively). This is inconsistent with the results of the OECD report, which show that these obstacles are moderately significant for entrepreneurs and completely insignificant in the opinion of experts (Tab. 1, symbols E & I, nos. 5 & 9, respectively). On the other hand, the barriers indicated by specialists concerning familiarity with foreign business practices and exporting procedures/paperwork, and meeting product quality/standards/specifications in foreign markets were not considered significant in the opinion of the surveyed entrepreneurs (Tab. 1, symbols L, M, N) as well as of the respondents (Tab. 3, symbols: L, M, N). This may demonstrate a greater accessibility of information tools and increasing facilitation of enterprise internationalisation processes, which opens the door to further research.

**Tab. 3: Barriers to SME internationalisation**

Barriers		Ranking by respondents
Symbol	Description	
A	Shortage of working capital to finance exports	1
B	Identifying foreign business opportunities	6
C	Limited information to locate/analyse markets	9
D	Inability to contact potential overseas customers	7
E	Obtaining reliable foreign representation	2
F	Lack of managerial time to deal with internationalisation	10
G	Inadequate quantity of and/or untrained personnel for internationalisation	5
H	Difficulty in matching competitors' prices	8
I	Lack of home government assistance/incentives	3
J	Excessive transportation costs	4
K	Developing new products for foreign markets	0
L	Unfamiliar foreign business practices	0
M	Unfamiliar exporting procedures/paperwork	0
N	Meeting export product quality/standards/ specifications	0

Source: Authors' own research based on the group administered questionnaire 2017 (n=275)

## Summary

Carrying out an economic activity entails inherent risks that need to be properly identified to be managed. This is particularly important when pursuing an activity in less known foreign markets, where acquiring information poses an additional difficulty, and cultural conditions may determine development. The perception of the risks relative to the internationalisation processes among entrepreneurs is a valuable source of knowledge of the prospects and pace of development.

The selected aspects of enterprise internationalisation concerning the impact of the human factor in the selection of the model and the method of its implementation are very diverse. The results of the opinion survey showed that the respondents are aware of the risks involved in market expansion. Still, most respondents expect the pace of SME internationalisation to accelerate. Moreover, the survey findings emphasise the company owner-manager as a key element faced with a number of challenges in the process of exploring new markets and adapting to a new environment by identifying and managing risks. According to the authors, the development of research in this field can help to facilitate the implementation of company internationalisation processes and to strengthen entrepreneurial attitudes of company owners. In addition, it will foster the building up of social capital for SMEs internationally. There is also a great need to further facilitate the association of international

business partners and strengthen the programs supporting SMEs in the internationalisation processes.

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## STATE SUPPORT SYSTEM OF INNOVATIONS IN SLOVAKIA

Ladislav Klement

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### Abstract

**Purpose:** Small and medium sized enterprises in Slovakia are facing various barriers where the system of state support in field of innovations is one of the most important. The Slovak government has started to pay attention to support of innovations relatively late. The aim of the paper is to evaluate the development of the Slovak innovation support system with an accent to tools of innovation strategies and compare the current conditions to the best practise of EU countries.

**Design/methodology/approach:** The paper analyses the history and implementation of innovation strategies in Slovakia and critically evaluates the current system of innovation support with respect to the best practise cases in European Union. Empirical data about the barriers to innovations were gained by the survey in 2014 realized at the sample of 150 small and medium sized enterprises. The respondents were randomly selected with no preference to industry sectors. The secondary data were collected from Eurostat and other relevant institutions. The author used documentary analysis, comparison, statistical and mathematical methods.

**Findings:** The first comprehensive innovation strategy in Slovakia was created only in 2007. There were a lot of government's measures oriented on support of innovation activities and development of pro-innovative environment for SMEs, but only several were implemented in full range. Even today the objectives of the Slovak Innovation strategy are relatively unambitious. There are various areas in Slovakia where the system of innovation support is far away from the European best practice examples (e.g. volume of enterprises' expenditures into innovations, missing public procurement for innovative solutions, high administrative burden and vulnerability of support system without EU structural funds).

**Research/practical implications:** The paper includes implications for innovations' support system in Slovakia. The paper brings recommendations for innovation performance growth in Slovakia aimed at government's support tools.

**Originality/value:** The paper comprehensively presents the development of government's support system for innovations in Slovakia. It critically evaluates the existing infrastructure and applied tools and identifies possible government's measures for future development of innovations in Slovakia.

**Keywords:** Slovak innovation strategy, innovation barriers, innovation support

**JEL Codes:** O30, O38

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## **Introduction**

The globalization brought many changes in the world economy and for the Slovak Republic it is not possible to be successful without a major utilization of innovations. Innovations are influencing every activity in human life not only today, but also in the future by new opportunities and living conditions (Maital, Seshadri, 2012).

The European Union is facing increasing global competition, including the field of science and technology, therefore it is necessary to ensure that innovative ideas turn into successful new products and technologies. The European Union produces almost a third of global production in science and technology. Although the market of countries of the European Union is the largest market in the world, internally it is fragmented in conditions for the creation, development and implementation of innovations.

Today, more than ever, a modern economy is based on knowledge and "innovation open" society. The innovation performance of enterprises is primarily determined by their own innovative activities and the interaction with their innovation-related environment. This environment typically differs among countries (Hinlopen, 2010). The role of national governments and even local self- governments seems to be crucial for stimulating the growth of innovation performance of the regions. The government plays the role as on the side of stimulating the supply of innovations as well as the side of demand for innovations (Hvolková, 2015, Klementová, 2016).

Lead institutions of the European Union recognized that it is necessary to manage and specially to coordinate the objectives and tools of innovation support systems in member states in order to streamline innovation processes as on the input side (to avoid overlapping of European, national and regional support due to scarce and expensive resources), so on the output side (to increase innovations and their successful application in practice).

Innovations are the accompaniment of business. They represent one of the best tools how to maintain and enhance the economic development and improve the competitiveness of enterprises in local and global business environment. Their essential feature is an implementation of new value-added to products, technologies or services at the market (Kovaľová, 2016).

## **1 Methodology**

The paper analyses the history and implementation of innovation strategies in Slovakia and critically evaluate the current system of innovation support with respect to the best practise

cases in European Union. The sources of information were selected Slovak strategic documents about innovations, declared by Slovak governments from 2004 till 2020. The realization of measures was evaluated according to documents from European Commission. The secondary data were complemented by databases of Eurostat and the Statistical Office of the Slovak Republic.

The paper presents results of empirical research realized in 2014 among Slovak SMEs about the main barriers in their innovation activities. The population consisted of 1020 randomly selected small and medium sized enterprises situated in Slovakia. The return rate of questionnaires was approx. 14.7%, so we have got 150 respondents. The sample of respondents included 37.34% of micro enterprises, 33.33% of small enterprises and 29.33 % of medium sized enterprises. By the selection of enterprises, we made no preference in their industry sector, nor by the region. The sample of enterprises were not representative according to the respondents' size structure, so we underpinned the conclusions by results from Innobarometer research. The relevance of results was tested by Chi-Square test.

To fulfil the paper goal, we formulated the research questions: What are the weaknesses of Slovak innovation support system in comparison to leading EU countries? What are the main barriers of Slovak SMEs in innovation activities?

## **2 Development of the innovation support system in Slovakia**

The Slovak Republic since 2004, as an EU member state, has been actively involved in the process of formation of the Lisbon Strategy through their representatives in the European Council. At this time, the Slovak Government submitted its own "national Lisbon strategy" called Competitiveness Strategy of Slovakia until 2010. It was built on two main pillars:

- the successful completion of structural reforms and maintaining their results
- systematic focus on fulfilling the development part of the Lisbon Strategy.

Science, research and innovations have been one of the themes within the second pillar of the strategy.

Until 2006, Slovakia had not established any institution (government body) which would deal with innovations complexly. Measures of state innovation policy were designed and implemented by various state authorities, particularly the Ministry of Education, the Ministry of Economy and their subordinated agencies. Relatively high fragmentation of responsibilities between government bodies caused low efficiency of the Slovak innovation system which main characteristic was underdeveloped coordination and consultation mechanism of public institutions.

In 2006 the government has approved the Science and technology policy till the year 2015. It defined the priorities for research and development in Slovakia. The main problem of this document was the identification of a large number of priorities (totally 12) and the major orientation to basic research without connection to the national innovation strategy.

In order to improve the implementation of the state innovation policy, in 2006 there was established the Government Council for Science and Technology. We need to point out the fact, that the research community and industry associations have participated more in the formulation of national science and technology policy than on preparation of the innovation policy. The result was a weak link between research and the business sector. Equally, the vertical coordination between national and regional innovation systems did not worked well. In 2011, the Slovak Government established the Council for Innovation, which has worked for only two years. In 2013, it was replaced by the Government Council for Science, Technology and Innovation (Balog et al., 2013).

The Slovak Government in an effort to develop a system of innovation policy adopted in March 2007 Innovation Strategy of the Slovak republic for the years 2007 - 2013, which was the first comprehensive strategy document that dealt with innovation and innovative businesses in Slovakia. The strategy included targets till the year 2013, according to which the innovations should have become one of the main instruments for development of the knowledge based economy and ensure high economic growth of the Slovak Republic (Innovation Strategy of the Slovak Republic for the years 2007-2013, 2007). This strategy should have been achieved through the creation of innovative environment and institutions (such as incubators, innovation centers, schemes, counselling centers, etc.).

Priorities of innovation strategy were intended to provide (Innovation Strategy of the Slovak Republic for the years 2007-2013, 2007):

1. high quality infrastructure and an efficient system for innovation development,
2. professionally prepared human resources for innovation activities,
3. effective tools for innovations enabling them to become a main part of the SMEs' activities.

The Slovak Innovation strategy for the years 2007 - 2013 was elaborated to specific actions through the Slovak Innovation policy for the years 2008 - 2010 and subsequently the Slovak Innovation policy for 2011 - 2013.

## 2.1 The Slovak Innovation policy for years 2008 – 2010

The Slovak Innovation policy was based on the Program declaration of the Slovak Government, on the National Reform Program for the years 2006 - 2008, on the National Strategic Reference Framework 2007 - 2013 as well as on the EU operating programs. The document declared the necessity of the innovation support, presented the support programs, projects and schemes and plan for creation of a network of regional innovation centers - RIC (Innovation Policy of the Slovak Republic for the years 2008 - 2010, 2008).

The Slovak Government proposed following measures to achieve objectives of the Slovak Innovation policy.

**Tab. 1: Measures of the Slovak Innovation policy 2008 – 2010 with their final evaluation**

1.	Creation of regional innovation centers (RIC)	unrealized
2.	Operating program Competitiveness and economic growth	achieved
3.	Project for national information infrastructure	achieved
4.	Operating program INTERREG	achieved
5.	Support for innovation financing and for innovation investments from public sources	achieved
6.	Competition „Innovative act of the year“	achieved
7.	Adaption of secondary and higher school to business sphere requirements	achieved
8.	System of lifelong learning	achieved
9.	Innovation vouchers	unrealized
10.	Innovation incentives	achieved
11.	Protection of intellectual property	achieved
12.	Support of projects within the Framework program Competitiveness and Innovations (CIP)	unrealized

Source: Own processing.

From all twelve measures of the Slovak Innovation Policy only nine were achieved and three measures remained unfulfilled. The Slovak Government due to the financial and economic crisis has used the state budget sources to support the creation and retention of job places in the economy. Due to lack of financial sources, the support was not provided in the originally contemplated extent and many, even low-cost measures (e.g. Innovation vouchers or support for the creation of projects in the framework program CIP) were not realized. EU funds provided through Operating programs represented the main source for the implementation of the Slovak Innovation Policy.

The Slovak self-governing regions had no institutional structures for managing of state and regional innovation policy, nor the institutional framework for linking the development of the industry with the results of research and innovations. Therefore, the Ministry of Economy, the Ministry of Education, Science, Research and Sport and the Ministry of Labour, Social Affairs and Family collaborated on the project of creating Regional Innovation Centers (RIC). The aim was to create a network of regional institutions to ensure the implementation of national

innovation policy in the regions. Due to lack of evidence supporting the sustainability of the project depending on funding from the ERDF, the Slovak Government stopped the creation of RIC in 2011 without any created institution.

## 2.2 The Slovak Innovation policy for years 2011 – 2013

The Slovak Innovation policy for the years 2011 - 2013 was already based on the Strategy Europe 2020, recommendations of the OECD and the Program declaration of the Slovak Government. The Slovak Government set thirteen measures to reach the aims of the Innovation policy till the year 2013 (Innovation policy of the Slovak Republic for the years 2011 - 2013).

**Tab. 2: Measures of the Slovak Innovation policy 2011 - 2013 with their final evaluation**

1. Support of innovative clusters	support scheme announced only in 2013 and 2014
2. Promotion of innovations	not realized
3. Competition „Innovative Act of the year“	achieved (2008 - 2016)
4. Strategic document for next planning period	achieved – transformed to RIS 3
5. Support of projects involved in programs of EU structural funds	unrealized
6. Education for SMEs about innovations	achieved – block of lectures
7. System of lifelong learning and advisory	achieved
8. Secondary vocational education	achieved
9. National project for increasing the Slovak innovation potential	not realized (lack of financial sources)
10. Support of innovations in enterprises through the Operating program Competitiveness and economic growth	achieved
11. Support of financing the innovations from public sources	program JEREMIE - achieved
12. Innovation vouchers	scheme realized only in 2013-2014
13. Protection of intellectual property	achieved

Source: Own processing.

The main source of financing of measures remained the European structural funds through the priority axes of the OP Competitiveness and Growth and the OP Research and Development. The measures were implemented through five different state's agencies. This fragmented system showed weaknesses in implementation of defined measures, so in 2012 the only implementing agency for the area of innovation and energy became the Slovak Innovation and Energy Agency and for tourism the Slovak Tourism Agency. This led to significant streamlining and clarification of information flows. From thirteen planned measures of the

Slovak Innovation Policy for 2011 – 2013 only ten were achieved and three measures were unfulfilled, again due to lack of financial sources. Some measures (i.e. Innovation vouchers, Support of innovative clusters) were implemented only in the year 2013, some were implemented as a one-shot activity (Education for SMEs about innovations).

### **2.3 Research and Innovation Strategy for Smart Specialisation of the Slovak Republic for 2014 - 2020 (RIS 3)**

RIS 3 was declared by the Slovak Government in 2013 as a basic document for support of research and innovations for period 2014 -2020. The main objective is a sustainable growth of economy and employment in Slovakia through targeted support of research and innovations by respecting of regional specifications.

RIS 3 is based on Strategy Europe 2020 as well as on National plan for reforms and specific recommendations of EU Council for the Slovak Republic. RIS 3 critically evaluates management of innovations in Slovakia before 2013 from the level of state authorities. It identifies strengths and weaknesses in the field of innovation and sets four strategic objectives (RIS 3, 2014):

1. integration of key industries that increase local added value through cooperation of local supply chains and promoting their mutual networking,
2. increase of the research contribution to economic growth through global excellence and local relevance,
3. creation of dynamic, open and inclusive innovative society as one of the prerequisites for improving the quality of the life,
4. improve the quality of human resources for innovative Slovakia.
5. Mentioned objectives should be achieved till the year 2020 by 20 measures classified according the set goals. After two years of RIS 3 declaration there were introduced only few measures stimulating enterprises to increase their innovations activities and tie them up to domestic universities and research institutions.

The history of Slovak system of innovation support could be illustrated also by the development of financial expenditures that have been spent in Slovakia (Tab. 3).

**Tab. 3: Expenditures on science, research and development as a percentage of the Slovak GDP**

	2000	2005	2010	2014
Total expenses	0.64	0.5	0.62	0.89
Private sector expenses	0.35	0.18	0.22	0.29
Public sector expenses	0.27	0.28	0.31	0.37
Universities	0	0	0	0.02
Private NPO	0	0	0	0
Foreign sources	0.01	0.03	0.09	0.21

Source: Eurostat, 2015.

Development of expenditures on science and research in the period 2004 – 2012 grew very slightly. This growth was secured mostly by the growth of public spending and also by the inflow of foreign funds (mainly from the EU structural funds). The share of private sector expenditures even declined.

We can conclude that the interest of the Slovak Government on science, research and innovations was more academic and for a period of 14 years the Slovakia failed to boot the support of innovation activities in the business sector. Also the goal for 2020 to reach the share of total expenses on science, research and development at 1.2% of GDP seems to be not very ambitious.

During the years 2000 - 2014 most of the measures of innovation policies has been financed from EU structural funds and the share of national funding was decreasing. There raises the question about the sustainability of the support system after the completion of subsidies from the EU.

### **3 Barriers to innovations for Slovak SMEs**

During the year 2014, we have realized an empirical research among Slovak SMEs with the goal to identify the main barriers of innovation activities among enterprises. Results in table 4 present that SMEs considered the lack of financial sources, the system of state support, inappropriate legislation, poor connection of enterprises with schools, high costs and complicated administrative environment as the biggest barriers to innovations. Respondents expressed strong dissatisfaction with government support system and its complexity. We can conclude that this was one of the biggest barriers for respondents - small and medium sized enterprises in Slovakia.

**Tab. 4: Barriers to innovations for Slovak SMEs**

	The importance of barrier				
	1 - the lowest	2 - lower	3 - medium	4 - higher	5 - the highest
Lack of financial sources	2.86%	14.29%	18.57%	17.14%	<b>47.14%</b>
System of government support for innovations	14.93%	8.96%	14.93%	17.91%	<b>43.28%</b>
Lack of information	18.46%	<b>27.69%</b>	26.15%	20.00%	7.69%
Lack of time for innovations	15.94%	23.19%	<b>30.43%</b>	14.49%	15.94%
Inappropriate legislation	9.09%	9.09%	22.73%	18.18%	<b>40.91%</b>
Low connection among schools and enterprises	14.71%	16.18%	19.12%	19.12%	<b>30.88%</b>
Insufficiently qualified labour force	10.00%	17.14%	<b>28.57%</b>	21.43%	22.86%
Low performance of Slovak economy	6.25%	10.94%	23.44%	<b>34.38%</b>	25.00%
Low purchase power of customers	5.88%	8.82%	27.94%	<b>29.41%</b>	27.94%
High costs for innovations	2.90%	10.14%	28.99%	21.74%	<b>36.23%</b>
Complexity of administration	7.58%	6.06%	19.70%	22.73%	<b>43.94%</b>
Uncertain demand for innovations	5.80%	13.04%	<b>33.33%</b>	20.29%	27.54%

Source: own processing.

On the other hand, the lowest barrier was the lack of information for performing of innovation activities.

The Chi-Square test confirmed ( $p=0.00329E-22$ ) at the significance level 0.05 that there is a dependence between the type of barrier and the importance of barrier.

Another research conducted by the authors of Innobarometer (2015) stated that the most significant barrier for Slovak enterprises, since the year 2012, was the dominant position of established competitors (63% of enterprises), lack of financial resources (67%), costs or complexity of meeting standards or regulations (68% respondents) and the low potential demand for innovations (56%). The smallest barrier was the difficulty in maintaining intellectual property rights (35%).

## Conclusion

History of the Slovak Republic in the field of building systems and policies supporting innovation is relatively reach in the terms of approved documents and plans, but achieved effects do not conform to the amount of resources requested by their implementation. EU membership significantly helped Slovakia in terms of forming a support system for research, development and innovation, as the Slovak Republic is bound and regularly controlled in the implementation of national reform plans in order to constantly progress in achieving goals and meeting the criteria of innovations. Thanks to constant feedback from the EU institutions, the Slovak innovation support system has transformed to the so-called "European model" (division

of powers and responsibilities of ministries and agencies are approaching the model in the leading countries of the EU innovation performance).

In the history of Slovakia, the research and innovation policies have been always a matter for central government institutions. For a long time the Self – governing regions had no political power and autonomy in planning and supporting the research and innovation activities. The first regional innovation policies began to emerge after 2007, while mostly they were only the plans to engage self-governments into EU operating programs in period 2007 - 2013. The government's efforts to create regional innovation centers (RIC) wrecked in 2011 on the complexity of Slovak legislation and conditions of the EU structural funds. The network of regional innovation supporting institutions has not been created yet. Research and innovation activities in the Slovak regions can be characterized by high and still increasing disproportionality, while the leader is the Bratislava region.

The Innovation Union initiative presents examples of best practice in area of supporting the innovation activities in economy. It is a set of 10 actions and objectives that may help EU member states in building and developing their own national and regional innovation systems (European Commission, 2010b). Analysis of the Slovak system of innovation support and its comparison to EU best practice model confirmed that weakness of the Slovak support system are especially in:

- the lack of business expenditures in research and innovations,
- the high administrative burden and rigidity of schemes supported by the EU structural funds,
- the missing of the public procurement of innovative solutions,
- the high vulnerability of the innovation support system if we reduce (stop) the financial support from EU structural funds.

The Slovak support system for innovations is strongly focused on the supply side. There are no national targets focused on stimulating innovation activity through public procurement of innovative products and services. Public procurement of innovative solution has been applied only in the field of computerization of the state management system, while in this area there were successful projects (electronic identity cards, central register of contracts) as well as unsuccessful projects (eHealth, Tax Information System). It is important to stimulate the government's and enterprises' demand for innovative solutions from universities and research centres (Nelson, 1993).

Another important change should be the reactivation of the Government Council for Science, Technology and Innovation, which showed minimal activity, although it was

established already in 2009. The board is controlled by the Slovak Prime Minister, members are ministers, representatives of educational institutions, research institutions and industrial and employers' associations. The main task is effective defragmentation and cooperation of public institutions for research, development and innovation (European Commission, 2014b).

The financial sustainability of innovation support system lays in balance of its resources. The Slovakia should dramatically increase the share of business expenditures on innovations as well as expenditures of universities and private non-profit organisations.

In 2015 there was introduced the tax relief for R&D performers as an indirect tool of the Slovak Government to motivate enterprises to increase the amount of money, which they invest into research and innovations (125% of R&D expenditures could be included in the tax base).

Various foreign comparative studies suggest several ways of creating supporting innovation policies and incentives (European Commission, 2014b, European Commission, 2015). At the same time many comparisons suggest that the success of innovation policies, as well as regional policy, is highly context-specific and dependent on past development. This means that the imitation of actions or certain components may not produce the expected results, which occurred after the application of such policies in other countries. Important role in the success of their application play trivia. Revolutionary elements and elements based on the past, choice of actors, historical development also play a significant role. Each situation is specific and formed or influenced by an array of features in a hard emulated combinations.

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## DESIGN THINKING: THE CASE OF BANKING SERVICES

Cyril Klepek

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### Abstract

**Purpose:** The banking industry has experienced an enormous amount of pressure to rebuild its own services. Mostly, because banking markets are extremely competitive and have many new competitors from other industries. Seeking competitive advantage in such an environment is, thus, a crucial activity. The way out seems to be in breaking barriers for company innovations.

**Design/methodology/approach:** This paper reviews five examples of successful implementation of design thinking (DT) in the banking industry. While some of them are well-known, others represent an original contribution to the design thinking research based on personal interviews with managers in ANZ bank, New Zealand. All samples were discussed and chosen with regard to financial a non-financial contribution of DT. Examples listed in this paper provide an answer to the question: could DT be the life ring for the banking industry?

**Findings:** The paper provides insights that the highest payoff from adopting a design thinking approach is not in coming up with superb product every week, but rather in innovating how people work together and how firms can adopt innovations as a part of company culture. The stories gathered in the article show us that despite many limitations design thinking has the potential to be a game changer. It could change the culture in the whole banking industry and decrease the widening gap between banks and its customers.

**Research/practical implications:** Findings have several keys managerial implications for bank managers while cantered on possible usefulness of DT applications.

**Originality/value:** This paper fulfils an identified need to study how banks could foster innovation processes. Focusing mainly on the banking industry, the paper is unique in its value.

**Keywords:** design thinking, banking, innovations, corporate strategy, organizational change

**JEL Codes:** G21

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## Introduction

Design thinking used to be associated strictly with physical products and the world of physical objects in general. We hear that design is a crucial part of success of every new product whether we talk about a dress from John Galliano or an electric car from Tesla Motors. It is of course true. Nevertheless, in the past several years the discussion has shifted and we are talking more about design thinking as a *way of thinking* (Brown, 2009). This concept is tied to the term *business innovation*, while DT seems to be something that could possibly redesign a whole business and bring source of sustainable competitive advantage for its users.

The banking industry has experienced an enormous amount of pressure to rebuild its own services. Mostly, because of banking markets are extremely competitive these days; banks face each other in fees and interest rates, but the levels remain roughly the same level. Moreover banks also have new competitors from many other industries.

Such a topic was chosen in aim to fulfil a gap in DT research in banking industry. The paper is structured as follows. First, we look closer to vast body of literature on DT. The following chapter focus on every aspect of concept of DT, from discussing core principles to identifying most valuable set of design thinking tools. In chapter three, five stories of implementing DT are listed. Of these examples four of them were previously published before and one is an original contribution to the DT research. In conclusion all findings are discussed and future possible implementations are revealed. Finally, I provide managerial implications based on previous research.

## 1 Literature review

When we search for literature on DT a short research history is revealed. Johansson, Sköldböck, Woodilla, & Çetinkaya, (2013) pointed out that four in five articles on design thinking were written after millennium. Johansson and Woodilla (2010) provide a very useful overview of the field of DT studies; they also distinguish between design based, scholarly literature and more business papers for practitioners. With paying all the respect to the first group for our purpose we focus more on literature of the second group. Roger Martin (2007a; 2007b; 2009, 2011) is a classic theorists in that field. Jeanne M. Liedtka is another example of business driven researcher in the field of DT. Most influential papers are *Solving problems with design thinking: Ten stories of what works* (Liedtka, King and Bennett, 2013), *Designing for Growth: A Design Thinking Tool Kit for Managers* (Ogilvie and Liedtka, 2011) and recently *Innovation as a Dynamic Capability: The Role of Design Thinking and its Parallels to TQM* (Liedtka, 2016). A

crucial source of design thinking literature is also handbook of design thinking called *This is service design thinking: Basics, tools, cases* (Stickdorn, Schneider & Lawrence ; 2011) and *Change by Design* (2009).

## 2 Design thinking

The term was popularized by founder of design consultancy company IDEO Tim Brown (2008). In very general DT is an interdisciplinary approach that combines different methods and tools from various disciplines. Probably the best definition, contributed by Stefan Moritz is that design thinking is a new holistic, multi-disciplinary, integrative field which enable to innovate (create new) or improve (existing) services to make them more useful, usable, desirable for clients and efficient as well as effective for organizations (Moritz, 2005). DT is problem solving methodology with many possible applications such as product development, IT, psychology, engineering, education or health care.

According to study Stickdorn, Schneider and Lawrence (2011) we identified five core principles of DT; user centered approach, co-creativity, sequencing, evidencing and holistic point of view. DT has many possible applications in problem solving and variety of tool set:

### Fig. 1: Most useful DT toolset for banking

1. In **STAKEHOLDER MAPS** we identify all possible groups (and their interests and motivations) involved with a particular service. Usually this is the first step in design thinking process
2. **OBSERVING** is a common title for many tools such as contextual interview, customer shadowing, culture probes, mobile ethnography or service safaris which all enables us to get more information about customers and their behaviour
3. **CUSTOMER JOURNEY MAP** helps us reveal all the customer touchpoints and given experience with existing product or service
4. **VALUE CHAIN ANALYSIS** is not necessarily part of designing process, but it is a very useful tool for identifying the ways in which you create value for customers from your point of view
5. **IDEA GENERATION** or commonly used brainstorming techniques are essentials tools for gaining new ideas and visions
6. **MIND MAPPING** is another powerful graphic technique which enable us generate insight from exploration, visually capture your thoughts and bring them alive
7. **VISUALIZATIONS** are robust tools for using imaginary to envision possibilities and bring them alive
8. **STORYBOARDS** could be one tool for **DESIGNING SCENARIOS** which is a perfect way how to test hypothetical stories and “fail” without losses
9. **SERVICE PROTOTYPE** is probably the most valuable tool enhancing us expressing a new concept in a tangible form for further exploration and testing
10. **LEARNING LAUNCH** means **creating an affordable experiment that lets customers experience the new solutions and test your key assumption**

**Source:** Stickdorn, Schneider and Lawrence (2011); Liedtka, King and Bennett (2013); author

## 2.1 Design thinking in process

DT is a creative process with a step by step manual on how gets things done. Nevertheless, every time it is unique process and each company uses design thinking methodology in slightly different way. Some techniques have proved to be more useful in banking industry, some we have found being more useful in retail business. The company itself can choose a course of a project way and can even repeat concrete phase of process to gain the desirable output. As we can see in Figure number 1 design thinking could be described as a 6-steps path; emphasisation, definition, ideation, prototyping, and finally, testing. As Brown (2008) mentioned first half of the process is linked with a divergent thinking while creating choices. Second part is associated with convergent way of thinking when we concentrate upon a several prototype and choose the best one.

## 3 Research context and methods

### 3.1 Sample identification process

In the next chapter 5 stories of implementing design thinking in banking are listed. Among these examples four of them were published before and the one is an original contribution to the design thinking research. Samples were chosen from various sources (papers, conferences etc) accordingly to their business and social impact on changing the banking industry - parameters in business: revenues, increase of loyalty and turnover increase; other parameters: PR impact and various success rates. In the first stage author collected all DT implementation in the banking industry. In the second stage top 5 stories were listed after discussion with bank managers, DT researchers and practitioners with regard to parameters listed above. Deep research activity was necessary while gaining all these examples, prioritising and personal interviewing managers from ANZ Banking Group. Research activity was conducted in New Zealand, 2016. Used keywords were *design thinking, innovations, products and services*.

### 3.2. Samples of application Design Thinking in banking services

#### 3.2.1 ANZ Banking Group\_Design Thinking Implementation

**Company's need:** In June 2015, all board members and other top managers from the fourth largest bank in Australia and largest bank in New Zealand have flown to Silicon Valley in aim to learn how to become more customer- centered. As ANZ regional manager Peter Brodrick mentioned during the interview: "... *Customers are our bread and butter and if we can create solutions to make their banking easier, more efficient and smarter, than it would bring us an*

*incredible amount of value.*” What ANZ desired by using design thinking was more than few new services developed while using design thinking. Company’s need was to become more comfortable in “*customer’s shoes*” and change the entire culture of how people in ANZ banking Group thinking. Interview was conducted in New Zealand, 2016

**Design thinking contribution:** In past few years, managers in ANZ realized that more than spending time with its clients and listening to their needs they are dealing with internal processes. For the past several years’ managers attended workshops called Better by Design. In such events managers learned how to emphasize with customers, creating prototypes etc. What was mentioned as two biggest contributions was rapid prototyping and change enhancement. A powerful tool of prototyping which enable the user testify more products and creating solutions which will add value to its customers is the first example. Even more important was for managers to use design thinking as an enhancement of change and methodology which brings innovative culture. As some mentioned: “... *banks are a very slowly moving organisations and innovations are not a part of the culture. Yet customers are expecting innovations, new products, and new business all the time. So we need to respond to that and design thinking is paying a big contribution for that.*” One of many tangible outputs was developing cutting edge mobile app that allows employees to better manage their time, vacations schedule and many more, while also enabling them to cooperate with colleagues. **Tools:** customer journey mapping, brainstorming, design scenarios

### 3.2.2 Bank of America\_Keep the Change

**Company’ s need:** As Brown recalled “...Bank of America came to IDEO to help generate product ideas that would help them retain current customers while at the same time bringing in new ones” (2008, p.119).

**Design Thinking contribution:** In 2014 IDEO started fulfilling company’s need with deep research activity. Together with researchers from BoA they approached the crowd. As Bloomberg Case Study mentioned; they observed a dozen families and interviewed people on the streets. They watched people at home as they paid and balanced their check books. They tagged along with mothers as they shopped at Costco, dined at Johnny Rockets, and made deposits in drive-through tellers. As Brown (2008) remember; „We found that that all people want to save some money but only a few have strategies for doing so“(119 p.). After the observations phase the team created many prototypes and the in end, overwhelmingly favoured one: rounding up the financial transactions of consumers and transferring the difference to their savings. The idea was called „Keep the Change “and enable customer to transfer small amounts

of cents up to dollar from every purchase they make. For AoB it was a huge success; more than 8 million customers enrolled and saved together more than \$1 billion (Brown, 2008). **Tools:** observing, service prototype, visualisations, design scenarios etc.

### 3.2.3 Juniper Bank Customer Service Strategy

**Company's need:** What company's need was answers for questions such as: does banks still need buildings, vaults and tellers? Who our customers would be? How to solve everything that is wrong? How to define and establish our strategy (Brown, 2008)?

**Design thinking contribution:** IDEO started with emphasisation, while conducting many focus groups and surveys. The first aim was to better understand what customers think about their money and what customer segment would be most suitable for the newly founded bank. IDEO identified four major customer groups. All decided to focus mainly on "Onlookers" when this group was "...completely focused on day to day financial situation and did almost no planning for the future" (Brown, 2008, p.54). As bankers added; "they needed the most help with their finances. They also were most likely to be loyal to services that they liked, attitudes that resonated well with the ethos at Juniper". Much effort was given to customer journey map when IDEO developed concept of "Experience Architecture" with online banking. All touchpoints during customer experience were tested during the prototype phase of project. That gave company quick feedback and enabled to developed user-friendly web content made for its right target market. **Tools:** observing (shadowing, "fly on the wall", customer journey mapping, prototyping, etc)

### 3.2.4 PNC Bank\_Virtual Wallet Interactive Banking Experience

**Company's need:** In 2008 PNC came to IDEO to develop a new concept of banking aiming for tech- savvy Generation Y. Young customers are for bank very valuable assets and PNC had 70 million of them. The company's need was to bring a new innovative way of banking with deep focus on all technology aspects that would help student better manage their money and make these Generation Y lifelong satisfied customers (Brown, 2009).

**Design thinking contribution:** PNC bank and IDEO came up with Virtual Wallet; three banking products combine together, powerful visualization of its personalised websites, many features such as the Punch the Pig - which help customer customers better managed their savings, slide bar to graphically illustrate all available funds, several tools for allowing their parents being involved and informed about their spending and many more. All graphics and features were tested while prototyping. Several time awarded Virtual Wallet become essential

part of PNC business and help this generation better managing their finance while using another banking products as well. **Tools:** observing, visualization and prototyping.

### 3.2.5 Suncorp\_Postmerge acquisition

**Company's need:** In 2006 the Australia's insurance and banking giant announced merge with another insurance giant Promina: two extremely valuable but different companies. While the Suncorp was highly centralized, Promine on the other hand was highly decentralized – more a house of brands, than a single organisation (Liedtka, King and Bennett, 2013). Companies had different business approach with remarkably different company's cultures. Successful integration was the business problem the Suncorp was dealing with.

**Design thinking contribution:** Merge made a good financial sense, but how to communicate such a message to employees? Second road created SunCity, while drawing a map of the new business with its own piazza, streets, parks and buildings representing the new business' values as well as its customers, suppliers, advocates and the wider community. People created its own neighbourhood within the city allowing all collaborate together and share vision of future development. Company's need was fulfilled while staff surveyed showed that 94 % of employees understood the vision in compare to 48 % from previous surveyed (Liedtka, King and Bennett, 2013). **Tools:** Visualizations

## 4 Findings and managerial implications

In the section above I gathered findings which proved to be useful and all provided information is based on theoretical research and discussion with managers from involved banks, all findings also provide a comprehensive answer to the question asked at the beginning of the research process; could design thinking be beneficial to the banking industry? What findings revealed is that value proposition of design thinking consist from three main benefits; saving resources when prototyping, bringing add values services and most importantly empowering innovations and change management. All benefits are briefly discussed below.

### 4.1 Company can save resources with designing

Launching a new product or services is a costly business. But as we could see in Bank of America example and in Juniper Bank prototyping enhanced testified all features, graphic scenarios and feasibility of products even before the main investment is made. It also prevents to see outcome from the wrong scenarios, when “*the interdisciplinary nature of design thinking*

*ensures that innovations are naturally balanced between the technical, business and human dimension”* (Holloway, 2009). The prototype is also a great tool for saving the most valuable resource – time. Going to the meeting and showing a concept leads to much faster decision making. Another benefit is the ability of design thinking to reduce cognitive biases in the product development. Design thinking could be beneficial also in HR departments. As we have seen in ANZ Banking Group design thinking enables us to focus on the people and the experience, not the process.

#### **4.2 Design thinking empowers innovative culture and enhances organizational change**

A firm’s culture is, besides with firms experience with innovations, often mentioned as the most important factor enhancing corporate innovations. Many examples listed above show us that this is probably the greatest benefit of applying design thinking methodology.

PNC Bank after successfully launching Virtual Wallet has kept on innovative culture and in 2013 rolled out first ever portable pop-up branch. One of the best labs was made by BBVA. Once again, we can see that once innovative culture has planted a seed, another innovation usually follows. Also as Mickahail (2015) mentioned it is worth the effort for the companies to initiate design thinking for the company employees. They can expect improved communication, creativity, collaboration, enhanced company culture and new innovations as results. Another example shows us how visualization could be worth it. Especially for change managers. All systems are nowadays much more complex and sophisticated, visualize is a way to affectively inform people and get employees involved. Suncorp postmerge acquisition would be much more difficult without using some of the powerful tools of design thinking.

#### **4.3 Bringing add value services**

At the end design thinking enables finding brand new solutions for its clients. As managers from ANZ Bank reported many times – if they want to deliver value added services, they need to know what exactly clients need and how the service or product should be tailored to be most beneficial for its users.

### **Conclusion**

Design thinking enable bankers to bring customers into the process whether it means showing them all processes in the ATM machine or information about retirement planning. As many findings listed above show: design thinking is highly beneficial for the banking industry.

The highest payoff from adopting a design thinking approach is probably in innovating how people work together and how firms can adopt innovations as a part of company culture. The stories gathered in the article show us that despite many limitations design thinking have the potential to be a game changer. It could change the culture in the whole banking industry and decrease the gap between bankers and its customers.

Design thinking also proved to be valuable for its ability to prototype solutions in the early phase of product development process and save resources. Brand strategy and change management are other areas in which design thinking turn out to be highly beneficial.

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## ENTREPRENEURSHIP ON THE FINANCIAL MARKETS BASED ON THE SELECTED INDICATOR TECHNICAL ANALYSIS

**Andrea Kolková**

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### **Abstract**

**Purpose:** Entrepreneurship on the financial markets is currently associated with a lot of innovations. Financial managers are not limited in cash flow planning only by traditional instruments such as stocks or bonds. For effective use of modern tools, it is necessary instruments to predict courses. Possibility is a technical analysis. The aim of this paper is the application of the Parabolic Stop and Reversal indicator on today's FOREX and detection whether prediction of growth or decline of the currency pair according to this indicator is effective, so it could be used for more efficient planning of entrepreneurial finance.

**Design/methodology/approach:** EUR/USD currency pair has been chosen for the analysis. The currency pair will be tested at the selected time frame form. The effectiveness of selected technical Parabolic Stop and Reversal indicator will be tested with the use of digital options.

**Findings:** Paper evaluates the effectiveness of selected technical indicator. It applies theoretical knowledge about the Parabolic SAR indicator on the FOREX market and in particular on the EUR/USD currency pair. The result is, whether the number of profitable trades made under the impetus of the trading system based on this indicator is greater than the number of losing trades in a given time frame.

**Research/practical implications:** In the case of confirmation of the effectiveness of this indicator it is suitable for practical applications in trading FOREX. In subsequent research, it is possible to verify whether this indicator is also usable on other contemporary markets, such as equity markets, futures. Entrepreneurs and the traders can use this tool to manage their available funds.

**Originality/value:** Researches focus primarily on well-known indicators as weighted averages or MACD. Parabolic SAR indicator is in theory generally poorly described and defined. Today, it is increasingly difficult to store the available funds efficiently and therefore may benefit from any new tools for the structure of entrepreneurial finance.

**Keywords:** Parabolic Stop and Reversal indicator, FOREX, Digital Option

**JEL Codes:** G14, F31

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## Introduction

Businesses in the financial markets are currently enjoying great prosperity. Entrepreneurs do not already impose available funds on futures accounts or other bank products, as in the recent past. To insert available funds in a profitable banking product is almost impossible today. Therefore, many business owners and financial managers allocate funds on the capital market. There is treasury management which deals with a strategic as well as operational management of cash. According to research by Philips (1997) even before the financial crisis, the interest in information from the area of capital markets in managing corporate finances, was the second highest.

Table 1 provides results from a Treasury management association survey of the informational needs of the treasury profession. The areas were range on a seven-point scale, with 1 is very low and very high 7 informational needs.

**Tab. 1: the informational Leeds of the treasury profession**

Area	Rank	Average Rating
<i>Corporate Finance</i>		
Capital Budgeting		3.79
Capital Markets		4.46
Capital Structure		4.26
Dividend Policy/Practice		3.39
Financial Planning		4.56
Mergers/Acquisitions		3.79

Source: Phillips, A (1997)

Nowadays, financial markets are no longer only for "big players" at all, as stated by Kisela (2015). Also small investors and traders have strong presence. It creates a new group of small to medium-sized entrepreneurs, whose business is based on speculation on financial markets, particularly on FOREX. Entrepreneurship is usually realized either from its own funds, which are usually mixtures released from another business or based on the appreciation of clients' free funds.

To find the best strategy for the business, which would provide a permanent 100% profit is impossible. There are naturally very few publications, which would indicate successful strategies. As reported by Petrov and Tribelsky (2015) "it is explained by obvious commercial importance of such results. It is difficult to imagine a person, who has succeeded to build up such a strategy and then published all details in a scientific paper. Moreover, if such a person appeared, he/she immediately would have received a lot of followers, whose action in the

market would change its dynamics, so that, eventually, the developed algorithms would stop working“.

The interest in finance has been also growing among consumers, as proved, for example, by researches Koraus at all (2016).

## 1 Methodology

This paper analyzes the strategy based on the Parabolic Stop and Reversal (SAR hereinafter). After analyzing the separate indicator there has been applied a trade filter and a Moving Average Convergence/Divergence indicator (MACD hereinafter). Indicator and subsequently the filter were applied to data from the FOREX market. Specifically the currency pair EUR/USD was subjected to analysis.

The values of the EUR/USD were used based on the daily time frame. Data were analyzed on annual frequencies and for the past 10 years. Generally 2 943 values have been subjected to analysis. The data source for this analysis was the program Metatrader 4 (MT4 hereinafter), which is currently the most widely used program, not only for data acquisition, but also for the small business entrepreneurs. The obtained data was formatted in OHLC together with the traded volume. To calculate efficiency strategy Excel program was used including the instrument TA-Lib Pro Excel.

The resulting signals, which were quantified from assembled trading systems, have been applied to digital options with three-day expiration, with the following logic: A digital up option is considered a buy signal and a digital down option is the sell signal. In the current period the digital options are in the rate of return of 85.01% (for example, a broker XTB on the Basic Account). Based on this measure the total profits of the trading system are then calculated.

### 1.1 Parabolic Stop and reversal ( SAR hereinafter)

Parabolic SAR is a typical following indicator. The author of an indicator is W. Wilder (Wilder, 1978) in his book New concepts in technical trading systems. Parabolic system is not formed by a curve, as is the case of MACD, but by a series of points corresponding to each time frame. The indicator can be written using the formula,

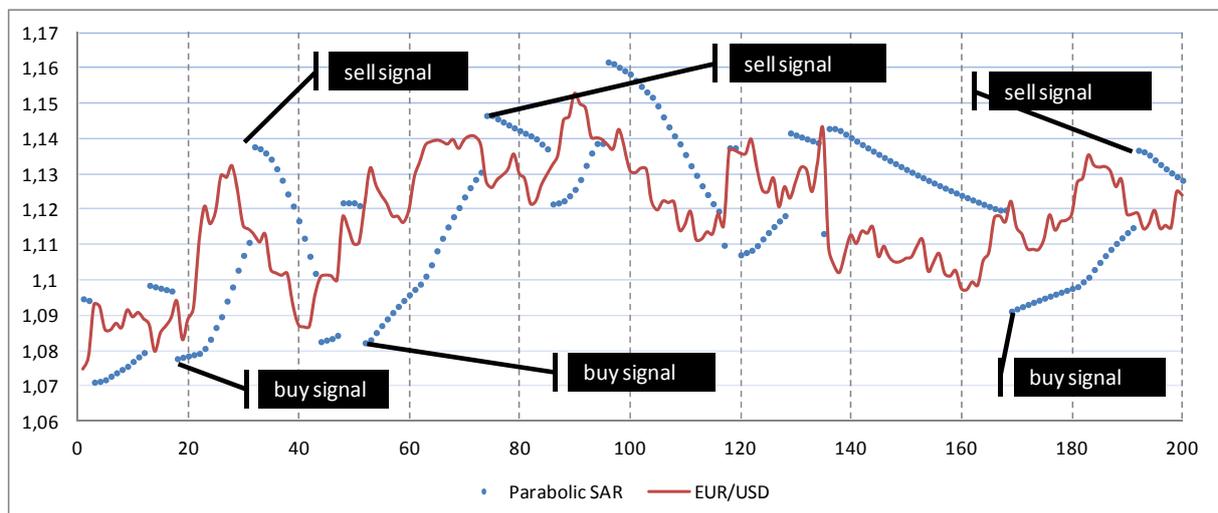
$$SAR_0 = SAR_{-1} + \alpha(P_{ex} - SAR_{-1}), \text{ where}$$

$SAR_0$  is the point value of the indicator for the given time frame,  $SAR_{-1}$  is the point value of the indicator for the previous time frame,  $\alpha$  is the acceleration coefficient,  $P_{ex}$  is the maximum rate recorded during the current trend.

Acceleration coefficient is a unique instrument and determines how fast the values are changing in the direction of the trend. The basic setting is suitable for a minimum growth level of 0.02 and the maximum value should not exceed 0.2. The system can be set even more responsive by reducing the acceleration coefficient. On the contrary, by its increase it is possible to achieve a slower system response to changes in the exchange rate. In practice the acceleration coefficient ranges from 0.015 to 0.025 in its low and from 0.18 to 0.23 in maximum size. In this paper, the basic version of the accelerator is used.

Business system then indicates entry into a long position when the points of SAR begin under the value of EUR/USD. In the case they begin above the values, it is an impulse for sale. Examples of signals to buy and sell are in figure 1.

**Fig. 1: Examples of signals**



Source: own calculations

## 1.2 Moving average Convergence/Divergence

MACD is one of the most widely used indicators at all. In the basic version, which is also used in this paper is the difference between the 26-day and 12-day Exponential moving Average (EMA hereinafter). Along with thus obtained MACD curve is still necessary to draw a 9-day curve EMA, which is called signal curve. EMA indicator can be calculated based on the relationship,

$$EMA = P_1 \cdot K + EMA_0 \cdot (1 - K), \text{ where}$$

$$K = \frac{2}{N + 1}, \text{ where}$$

$N$  is the number of days to quantify EMA,  $P_1$  is today's course and  $EMA_0$  is yesterday's EMA value.

The trading system chosen here then relies on the crossing of the oscillatory curve with the MACD curve. If MACD crosses the signal curve from the bottom it is a signal to buy EUR/USD if conversely, to sell.

If the MACD rises above its zero level oscillation, signals this movement, as stated Veselá and Oliva (2015), a change from bear to bull trend and conversely. Intersecting the oscillating line above is a signal to buy down option, otherwise it is a signal to purchase option up.

### **1.3 Digital (binary) option**

As stated by Rick Thachuk (2010) "binary options have, for some time, been available over the counter but they are typically marketed as exotic options to institutions and often packaged with other derivative-type products."

In the US, the retail customer had to wait until mid-2008, when the American Stock Exchange and Chicago Board Options Exchange listed binary options on select stocks and indices. However, these have not attracted any significant retail customer base.

However, according to Jaworsky (2006) first binary options were introduced by CBOE at a press conference on 10 July 2006 as one of his main financial innovations. Although the first trades were executed on the exchange CBOE, today the vast majority is carried out on the Over the counter market (OTC hereinafter). OTC method of trading presents the market participants who trade directly together. In practice, one of the brokers is the counterparty of majority of the trades. Due to its simplicity, digital options have become very popular especially among small businesses.

Digital options are twofold – up and down. In the case of buying up the option speculates on the growth of the underlying asset, in this case the growth of the EUR/USD currency pair by one pip and more. When buying down option, we are speculating on the decline, the system is effective in case of a fall by at least 1 pip. At digital options it is known in advance not only the amount of prices but also the rate of return, which may vary for individual brokers. In this paper there was used the rate of 85.01% (for example, at a broker of XTB brokers).

#### 1.4 The volatility of the currency pair

The volatility of the currency pair in this contribution was calculated using a variable dispersion, which can be according to Hindels at all (2007) defined as the average of the squared deviations of individual values from their arithmetic mean, therefore,

$$\sigma_x^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}, \text{ where}$$

X is the exchange rate of a currency pair at a specified time, it is the median rate. For the disadvantage of interpretation, there is further used for the final evaluation the standard deviation, which is the square root of the variance.

## 2 Results

On the selected data there was applied a trading system, initially based solely on the Parabolic SAR indicator, later also in conjunction with the MACD filter. The data was tested in annual frequencies.

### 2.1 Volatility

For SME's are preferable currency pairs with lower risk, especially for low volumes of funds invested. As has already been defined for assessing the volatility of currency pairs it is preferable to use a coefficient of variation, not just the standard deviation, or variance alone. For this reason, the best currency pairs are those with the lowest coefficient of variation and these are mainly: GBP/USD, EUR/GBP, EUR/JPY, USD/JPY.

**Tab. 2: Volatility currency pairs**

Major FIX				
	Variance	Standard deviation	Mean value	Coefficient of Variation
AUDUSD	0,020748	0,144042597	0,766971894	18,78%
EURCHF	0,036686	0,191536579	1,459535265	13,12%
EURUSD	0,026299	0,162169	1,075109126	15,08%
EURJPY	249,0758	15,78213556	129,5402998	12,18%
EURGPB	0,00829	0,091051992	0,749275694	12,15%
GBPUSD	0,026872	0,163926908	1,622068041	10,11%
NZDUSD	0,432306	0,119118846	0,657499823	18,12%
USDCAD	1,596773	0,18728771	1,263634677	14,82%
USDCHF	1,516875	0,248907795	1,231614771	20,21%
USDJPY	11546,27	14,02675809	107,4535897	13,05%

Source: own calculations

According to the portal finance.cz (2017) absolutely dominant element is the US dollar, which is present in 86% of all transactions on the Forex and over 90% of all trades include the US dollar, euro, Japanese yen, British pound or Swiss franc. Even the most widely used currency pair is the EUR/USD, which was used in this article and in particular for SMEs make up the largest number of trades.

## 2.2 The trade system Parabolic SAR

Using Parabolic SAR indicator there was observed 7 profitable years out of 12, the remaining 5 reached losses as shown in Table 3.

**Tab. 3: Results of the trade systém Parabolic SAR**

Parabolic SAR						
	total signals	profitable signals	lossy signals	ending profit	profit with transaction costs	
2006	21	8	13	-0,006	-0,0049212	
2007	16	10	6	0,0179	0,01468158	
2008	19	9	10	0,0136	0,01115472	
2009	17	5	12	-0,0232	-0,01902864	
2010	20	9	11	-0,0335	-0,0274767	
2011	19	11	8	0,02272	0,018634944	
2012	20	14	6	0,02671	0,021907542	
2013	17	10	7	0,00091	0,000746382	
2014	17	6	11	-0,00647	-0,00530669	
2015	16	7	9	0,00133	0,001090866	
2016	20	12	8	0,00363	0,002977326	
2017	9	1	8	-0,03059	-0,02508992	
total						
profit/signals	211	102	109	-0,01296	-0,01062979	
mean value	17,58333	8,5	9,083333	-0,00108	-0,00088582	
variance	9,409722	10,9166667	4,909722	0,000368	0,000247276	
standard deviation	3,067527	3,30403793	2,215789	0,019172	0,01572502	

Source: own calculations

Reached loss, however, was higher than the profit of 7 successful years, so overall it was a loss of 129 pips before counting transaction costs. After taking account of transaction costs it is the loss of 106 pips. The year of 2017 does not naturally contain trades from all over the season, but only to 13.3, therefore, they may be described as incomplete. If the statistics include full year 2017, we will get a profit of 176 pips, respectively 144 pips after counting transaction costs. Standard deviation from mean variance was with transactional cost 1.5%.

### 2.3 The Parabolic SAR with MACD filter

When using the Parabolic SAR indicator, along with a filter, which was voted one of the most widely used MACD indicators, the results are different. As can be seen from Table 4 the number of transactions was significantly reduced. When using the indicator alone, system could trade up to 211 signals. When using a filter indicator, the number of transactions declined to 20, while indicator MACD separately initiated 81 signals. Of the 20 provided signals 13 were profitable, which represents 65% of profitable trades.

**Tab.4 : Results of the trade systém Parabolic SAR with MACD**

Parabolic SAR+MACD							
	signals MACD	total identical signals	profitable signals	lossy signals	ending profit	profit with transaction costs	
2006	5	1	1	0	0,0121	0,00992442	
2007	5	1	1	0	0,0042	0,00344484	
2008	9	2	1	1	-0,0015	-0,0012303	
2009	4	0	0	0	0	0	
2010	3	1	1	0	0,00567	0,004650534	
2011	10	2	2	0	0,0282	0,02312964	
2012	11	3	2	1	0,01581	0,012967362	
2013	8	0	0	0	0	0	
2014	6	3	2	1	0,00207	0,001697814	
2015	6	2	1	1	0,00256	0,002099712	
2016	11	5	2	3	-0,03803	-0,03119221	
2017	3	0	0	0	0	0	
total							
profit/signals	81	20	13	7	0,03108	0,025491816	
mean value		1,666667	1,08333333	0,583333	0,00259	0,002124318	
variance		2,055556	0,57638889	0,743056	0,000218	0,000146894	
standard deviation		1,433721	0,7592028	0,862007	0,014777	0,012119981	

Source: own calculations

Business system based on the Parabolic SAR indicator and MACD filter showed a profit in the whole period in 10 out of the 12 monitored years. In 3 years there have not been used any trades. The total profit thus amounted to 310 pips, with the inclusion of transaction costs of 254 pips. It is therefore possible to describe the trading system as functional.

### Conclusion and discussion

The results clearly show that for SME's is preferable to use Parabolic SAR indicator with MACD filter. There are less resulting signals to effect transactions than when parabolic SAR used alone. However, their profitability is higher. Ambiguity of the profitability based on the

parabolic SAR without a filter, you can confirm and research and Mir Lashkari Yazdi (2012), which were used years 2001-2010.

Supreme profits using this trading system were reached in 2011, and it 0,0231 pips with transactional costs. In contrast, the lowest profit could have been achieved using the currency EUR/USD in 2016.

Business system provides a total of 65% profitable trades, by appropriate selection of money management can be the system SME's definitely recommended. An analysis of volatility like that, of the major currency can be recommended for SME's mainly couples GBP/USD, EUR/GBP, EUR/JPY, EUR/CHF, USD/JPY, USD/CAD, or are utilized EUR/USD.

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## INNOVATION AND QUALITY AS THE TOOLS FOR MANAGING FOR THE SUSTAINED SUCCESS

Marcela Koval'ová

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### Abstract

**Purpose:** The paper is aimed at the proposition of simple balanced framework for managing for the sustained success of selected organisation (faculty). The audit of innovation system was elaborated to examine the current situation and to set the base for further proposal of innovation-quality map, strategic map, and quality framework for managing for sustained success over the long term.

**Design/methodology/approach:** The innovation audit, using the standardised set of questions, was performed to examine the current situation in the innovation system at the faculty. The gap analysis of the results helped to review and summarise the needs and requirements of the faculty to implement them into innovation-quality map. Current process map and the recommendations from ISO 9004:2009 were critically assessed; the innovation and quality indicators were elaborated so that the innovation and quality performance management can be joined. Based on the previous, the total balanced quality framework was proposed, helping the faculty to manage the sustained success in a systematic way.

**Findings:** The faculty has the capability of managing the innovation but still lacks the systematic and integrated approach. The elaboration of innovation-quality map, by setting the innovation and quality indicators and initiatives, helped to join these two preconditions for the sustained success. The map was further integrated into the strategic map as a part of innovative processes in the internal perspective of balanced scorecard conception. As no similar tool exists, the total balanced quality framework was proposed. The paper is practically oriented and can help the faculty to maintain its quality management system and manage it in connection with the innovations.

**Research/practical implications:** The research evidence came mostly from the secondary literature review, structured interviews with the quality managers together with the brainstorming method, author's own experience and standardised set of questions used in the innovation audit. The main practical implication of this practitioner paper lies in the proposition of the innovation-quality map, strategic map, and the total balanced quality framework as the base for further building of quality management system in the organisation with the link to innovation. The other outcome of the paper is the proposition of key steps (framework) for implementing the total quality principles in the organisation.

**Originality/value:** The main added value of the paper is the proposition of the innovation-quality map and the strategic map of the organisation as the precondition for further building of total quality management system. No other similar study exists in this field of interest.

**Keywords:** Quality, Sustained success, Innovation profile, Strategic map, Total balanced quality framework

**JEL Codes:** M10, O31, I23

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## **Introduction**

Business innovation and quality management are closely linked as they are the conditions for business competitiveness and market success. In current, rapidly changing, environment organisations strive for competitiveness which means staying profitable, meeting customers' needs and being ahead of the competitors. The researchers have only recently begun to explore relationships between quality management and innovation performance (Leavengood, 2011) but they do confirm quality itself is not enough in today's business environment and companies should seek for new innovative offerings that are valuable for customers (Bettencourt et al., 2013, in Arshad and Su, 2015). The authors state quality and innovation can lead to competitive advantage of the organisation, helping it to confront market competition and achieve sustainable management (e.g. Schniederjans and Schniederjans, 2015; Wu and Lin, 2011).

The paper is aimed at the proposition of balanced framework for managing for the sustained success of selected organisation (faculty). The link between the innovation and quality as one of the preconditions for business performance is reviewed and summarised in the first chapter of the paper. In the practitioner part of the paper, I analysed the current situation at the faculty and propose the framework for managing the performance in form of the innovation-quality map, strategic map and total balanced quality framework. These tools can help the faculty to manage for the sustained success.

## **1 Managing for the sustained success through the linkage of innovation to quality**

In the literature, there are three groups of opinions on the linkage between quality and innovation. The first group of opinions declares quality and innovation are closely connected and there is a significant relationship between them. López-Mielgo et al. (2009) argue that innovative firms work in more systematic way as they follow some standards, e.g. ISO 9001; they identify customer's needs and are swifter than their competitors in developing innovative products or services. Developing innovation capabilities will permit companies to be proactive in the adoption of standardized management systems. Leavengood (2011) investigated the innovations (especially in small firms) can be managed and the innovation performance can be achieved by adapting quality management practices (e.g. ensuring the strategy and culture aligned with goals, customer focus, empowerment, education and training, process management etc.). Schniederjans and Schniederjans (2015) examined and confirmed positive relationship between social quality management (i.e. cross-functional cooperation, cross-

training, etc.) and innovation. Then, Arshad and Su (2015) confirmed the triangulations of TQM, innovation, and quality and stated the TQM principles provide solid ground for managing innovation and quality. The second group of opinions claims that a quality-oriented culture may be counter-productive to fostering a culture focused on innovation (Leavengood, Anderson and Daim, 2014). Leavengood and Anderson (2011, in Arshad and Su, 2015) found that quality oriented firms are not innovative because they overemphasis on the customer needs and are proactive towards them. Prajogo and Sohal (2001, Arshad and Su, 2015) predicted TQM practices could have harmful effect on innovation due to certain practices. The researchers in the third group of opinions state there is no clear connection (no clear empirical evidence or no test of the premise) between the innovation and total quality management quality (Singh and Smith, 2004; Kanji, 1996, in Leavengood, 2011) or the results of research have been mixed. The innovations are still considered one of the most important preconditions for the competitive advantage of the enterprise (Klement and Klementová, 2015). As the business environment constantly changes and demands improved flexibility, enterprises tend to introduce innovated procedures to stay competitive (Klementová, Hvolková and Klement, 2016).

The international standard ISO 9004:2009 states the sustained success of an organisation is achieved by its ability to meet the needs and expectations of its customers and other interested parties, over the long term and in a balanced way. Sustained success can be achieved by the effective management of the organisation, through awareness of the organisation's environment, by learning, and by the appropriate application of either improvements, or innovation, or both. To achieve the sustained success over the long term and in a balanced way, the organisations can implement a balanced scorecard concept. Al-Hosaini and Sofian (2015) consider the BSC a comprehensive framework that helps in translating the organization's strategic objectives into a coherent set of performance measures. This is done so that effective measurement becomes an integral part of the management process. Many authors have been dealing with the balanced scorecard implementation at the universities, e.g. Hladchenko (2014), describing the academic scorecards of Cologne University of Applied Sciences, Johannes Gutenberg University Mainz, Münster University of Applied Sciences; Philbin (2011) developing the balanced scorecard of Institute of Shock Physics at Imperial College London in order to measure performance and keep the sustainability of the institute in the long-term; Sayed (2013) adopting an exploratory approach and examining the BSC of 30 universities and affiliated units around the globe to determine if and how they have chosen to modify generic BSC model to suit their objectives.

## 2 Total balanced quality framework for managing for the sustained success

This paper proposes the strategic tool for managing the performance in form of innovation profile as well as innovation-quality map, strategic map, and total balanced quality framework in selected organisation (faculty in Slovak Republic). These tools are practically oriented and can help the faculty to keep and manage the sustained success.

Combining the requirements of international standard ISO 9001:2015, ISO 9004:2009 with the balanced and strategic way of meeting the expectations and needs of all interested parties, I try to elaborate a competitive total quality management framework to manage for the sustained success of the faculty over the long term. I analysed the current situation in the quality system and innovations and the possibility to manage for the sustained success by joining the innovation and quality. I assumed that quality and innovation are two of the most important factors for the competitiveness of the faculty, thus I elaborated a simple step-by-step framework for implementing quality and innovation into one total quality management system.

### 2.1 Methodology of research

The main objective of the paper is to propose a simple balanced framework for managing for the sustained success so that the needs and expectations of all interested parties can be fulfilled. The main objective can be accomplished by fulfilling the partial objectives (Tab. 1).

**Tab. 1: Partial objectives of the paper including the methods and expected outputs**

Partial objective	Method used	Expected output
To analyse the innovation profile and the innovation type of the faculty in order to assess current situation and to identify the gaps (weaknesses) in innovation system	<i>documentary analysis, reflective &amp; gap analysis, case study</i>	Innovation audit and innovation profile
To analyse the processes (the process map) of the faculty as well as the recommendations from ISO 9004:2009 so that the innovation indicators can be implemented into the quality system	<i>documentary analysis, reflective analysis, gap analysis, case study</i>	Innovation-quality map
To elaborate the balanced framework for managing for the sustained success	<i>documentary &amp; reflective analysis, case study</i>	Strategic map
To implement the total quality principles into the balanced framework so that the sustained success can be managed	<i>documentary &amp; reflective analysis, case study</i>	Total balanced quality framework for managing for the sustained success

Source: Tidd, Bessant, Pavitt, 2005, elaborated by the author, 2017

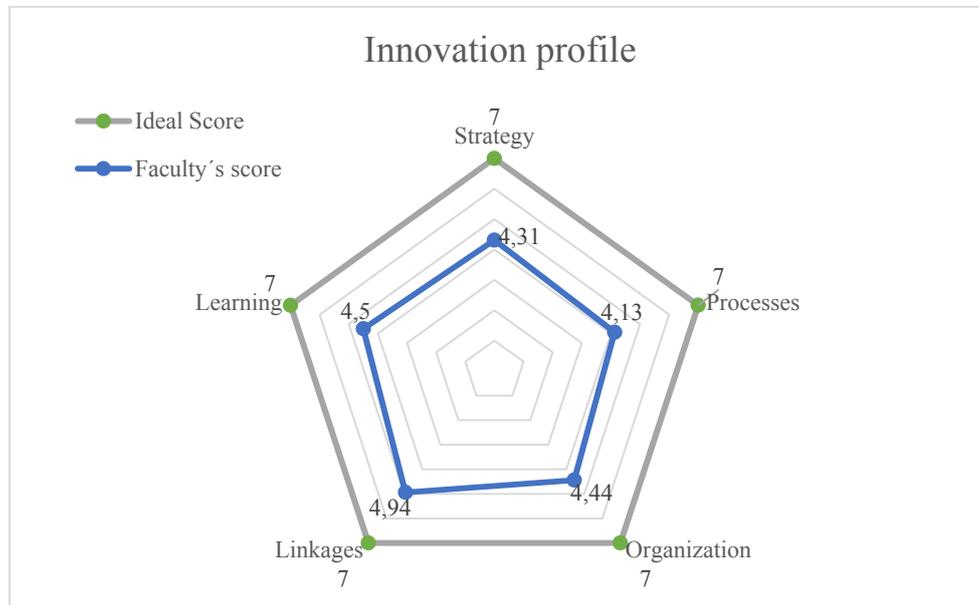
To get rich and subtle data to understand the possibilities of implementing the total quality management by using the strategic orientation, the research evidence came from analysing the documents of the faculty (documentary analysis, gap analysis) as well as the experience of the author (author is one of the quality managers and internal quality auditors) and interviews with the two quality managers of the faculty (reflective analysis, case study). In the first step, the innovation profile of the faculty was elaborated by interviewing the quality managers and using the brainstorming method together with the standardised set of questions (innovation audit as described further). Then, the innovation audit results were thoroughly analysed and the innovation profile was set and the gaps in the innovation system were identified and summarised by the quality managers. This helped to implement the needs coming out from the innovation audit results into the innovation-quality map. Also, current process map of the faculty and the recommendations from ISO 9004:2009 were critically assessed to further implement them into the innovation-quality map. The innovation-quality map was created as the result of the interviews with the quality managers and previous experience of the author. The needs of the faculty and other interested parties were taken into an account. The quality indicators, innovation indicators and innovation initiatives were elaborated as the result of research of the needs and requirements of the faculty and joined with process quality objectives from the current process map. The secondary research (literature review), interviews with quality managers and own experience of the author helped to do that. Using the documentary and reflective analysis and discussing the theory with the practice at the faculty (brainstorming method with quality system representatives of the faculty), the total balanced quality framework for managing for the sustained success was proposed.

## **2.2 Innovation-quality map and strategic map as a base for total quality framework implementation**

Before elaborating the innovation-quality map, the innovation profile of the faculty is created by using the standardised set of questions (Innovation audit as described by Tidd, Bessant and Pavitt, 2005). By means of a simple checklist of the factors influencing the innovations and assigning the score to each of them, the profile of innovation performance of the faculty was developed. A simple self-assessment tool, focusing on the important areas of innovation management was elaborated by using the interviews with quality managers of the faculty. The average scores were put in the table so that the gaps in the innovation management system can be identified (and further elaborated). Based on the innovation audit results, the area with lowest score is processes and strategy. The highest score was assigned to linkages and learning. The

differences among individual areas are not as great, thus the gaps found are almost evenly distributed in the areas (see Fig. 1).

**Fig. 1: Innovation profile of the faculty**



Source: elaborated by the author, 2017

Analysing the innovation audit results and innovation profile of the faculty (Fig. 1), main gaps in the innovation system can be summarized as follows (only the gaps with score less than 3 out of 7 were analysed):

- there is no clear and shared vision of how the faculty can develop through innovation and the employees have no clear idea of how innovation can help to compete,
- the faculty has identified the processes pursuant to ISO 9001:2008(2015), but still lacks the process approach to manage new product/service development effectively from idea to launch, and lacks the process management when reviewing new market changes (e.g. new requirements of interested parties) and what they mean for its strategy,
- the organisation structure does not stifle innovation, but rarely helps it to happen and the communication (intra-, inter-departmental) towards the innovation is not effective,
- there is no efficient system of capturing what has been learnt in order to mutually share the knowledge (so that the employees can make use of it),
- the system for choosing innovation projects (the system also lacks flexibility) and the link between the innovation projects and the overall strategy is not clear enough,
- the faculty uses no measurement to help identify where and when the innovation management can be improved.

Scrutinising the recommendations of ISO 9004 to identify the possibilities of their implementation to quality system, it can be concluded that the faculty has already implemented many of them into the quality management system (e.g. constant monitoring and analysing of the environment, establishing mutually beneficial relationships, establishing and maintaining the vision, mission, quality policy and quality objectives, proactive and system management of all processes, identifying the risks in the processes, self-assessment, measurement and analysis etc.). As the analysis of ISO 9004 recommendations was extensive and comprehensive, only the partial results are included here. The recommendations which can be included into the quality management system and have not been implemented yet are as follows: establishing and maintaining the processes for innovation and continual improvement; benchmarking activities; defining the objectives for the improvement of products, processes, structure and management system following the PDCA cycle; establishing an effective and efficient innovation process in alignment with the strategy of the faculty including the innovation objectives and impacts; elaborating the organization's commitment to innovation; assessing the risks related to planned innovation activities as well as preventive actions to mitigate them and adopting the learning organization concept (learning organization, organizational intelligence).

Further elaborating of the innovation system gaps and the recommendations of ISO 9004:2009 into the quality system of the faculty and using them as a basis, the innovation-quality map was elaborated and the innovation indicators were worked up (see the Fig. 2).

The innovation-quality map as a plan of innovation and quality indicators was prepared. Selected core processes (CP 1, CP 2 and CP3) were analysed in order to develop the innovation indicators together with the innovation initiatives required. The systematic and process approach was chosen therefore the indicators belong to specific processes which were considered the innovative processes of the faculty. Those are mostly the processes connected with the research, science, and international collaboration as they create a base for the innovations within the faculty at appropriate level of expertise.

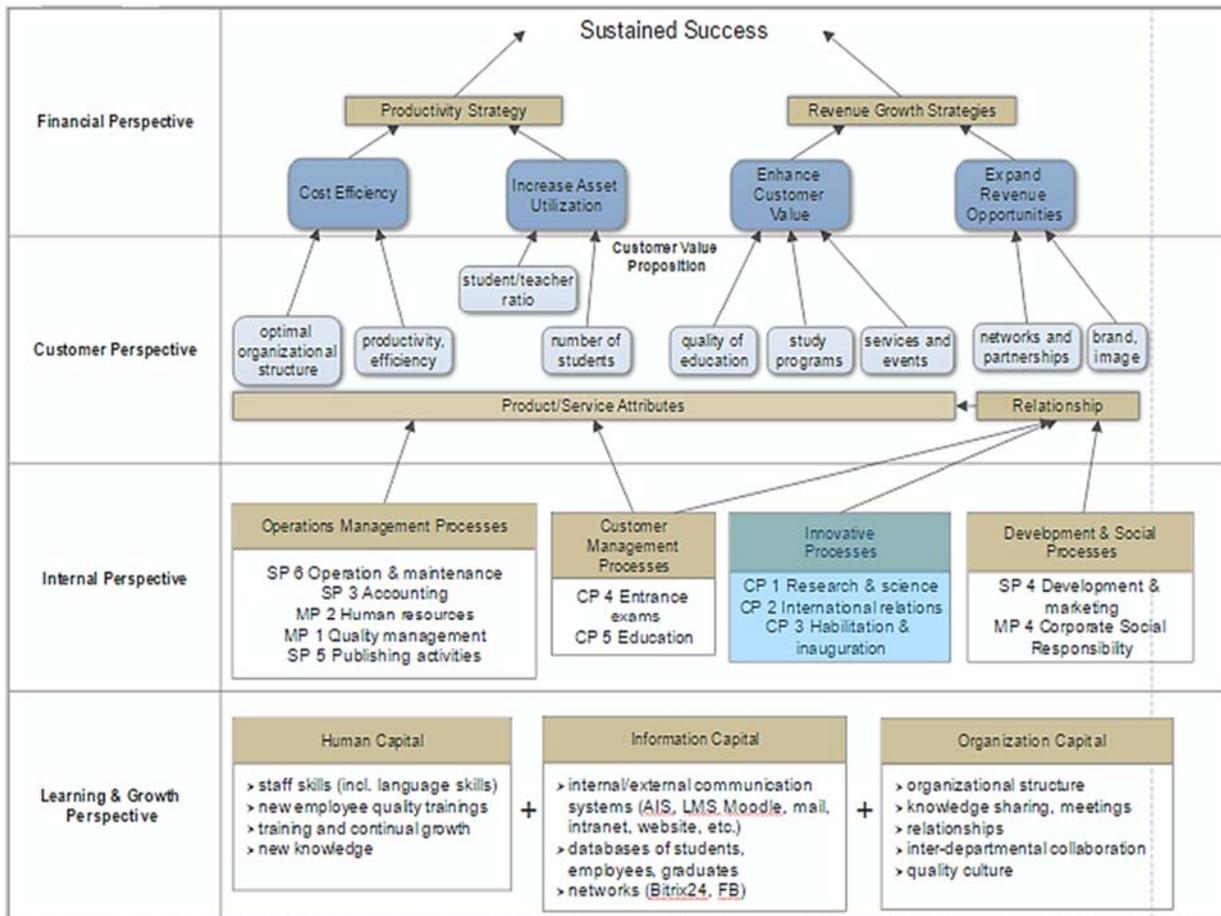
**Fig. 2: Innovation-Quality map of the faculty**

Internal Business Processes	Innovation-Quality Map			
	Process Quality Objective	Quality Indicator	Innovation Indicator	Innovation Initiatives
CP 1 Research & Science	To increase the level of scientific and research activities of the employees, in relation to accredited study programs, main trends, priorities, and policy of the Ministry of Education, as well as the strategic documents of the university and faculty in the field of science and research.	<ul style="list-style-type: none"> <li>• The number of submitted scientific/research projects at the national level</li> <li>• The number of submitted scientific/research projects at the international level</li> <li>• The number of publications within particular categories (according to the requirements of the Accreditation committee)</li> <li>• The number of employees engaged in the project submission of other university/universities</li> <li>• The amount of financial resources gained from the projects</li> </ul>	<ul style="list-style-type: none"> <li>■ The number of talents in the talent pool</li> <li>■ The number of staff at the Research and Innovation Centre</li> <li>■ The number of innovation opportunities found</li> </ul>	<ul style="list-style-type: none"> <li>□ To create an innovative system of talents treatment (talent pool)</li> <li>□ To re-organize the structure and the functions of the Research and Innovation Centre</li> <li>□ To develop and maintain an efficient system of searching for the innovations in the research and science activities</li> </ul>
CP 2 International Relations	To increase the quality and to support the science at the faculty through the international collaboration among the universities, teachers' mobility, student mobility as well as through the participation in the scientific and professional events organized by the partner universities across the Europe.	<ul style="list-style-type: none"> <li>• The number of bilateral agreements</li> <li>• The number of student mobility trips</li> <li>• The number of teacher/staff mobility trips</li> <li>• The number of common study programs</li> <li>• The number of international projects</li> <li>• The amount of finance for mobility trips</li> </ul>	<ul style="list-style-type: none"> <li>■ The value added from the international cooperation</li> <li>■ The cost/benefit analysis results of international cooperation</li> <li>■ Membership in the international organizations and networks statistics</li> </ul>	<ul style="list-style-type: none"> <li>□ To develop an innovative system of international cooperation quality evaluation (incl. the value added from the cooperation, real and quantifiable benefits from the mobility trips etc.)</li> </ul>
CP 3 Habilitation & Inauguration	To increase the attractiveness and credibility of the faculty by realizing the habilitations and inaugurations and to increase the qualification growth of the employees in order to improve the quality of education.	<ul style="list-style-type: none"> <li>• The number of applications for habilitation or inauguration procedure</li> <li>• The number of Associate Prof. and Prof. degrees granted</li> <li>• The number of habilitation theses</li> <li>• The degree of student satisfaction with the quality of education</li> </ul>	<ul style="list-style-type: none"> <li>■ The number of the applications from the side of talents</li> <li>■ The number of innovative theses</li> <li>■ The impact of the innovation on the community or interested parties (e.g. improved quality of life, increased business performance etc.)</li> </ul>	<ul style="list-style-type: none"> <li>□ To increase the applications for the procedures from the side of talents (from the talent pool)</li> <li>□ To develop and maintain an efficient system of searching for and managing the innovations (e.g. innovative theses reflecting the market requirements) in the habilitation and inauguration activities (incl. the cost/benefit analysis)</li> </ul>

Source: elaborated by author, 2017

The innovation-quality map was further adjusted in order to create a strategic and balanced map of the faculty. This is visualised in the Fig. 3. As it is shown in the figures (2 and 3), three processes were considered innovative: Research and Science, International Relations and Habilitations and Inaugurations process. The numbering of the processes follows the current process map of the faculty however one extra (new) process was added into map: MP 4 Corporate Social Responsibility. In order to fulfil the expectations and needs of all interested parties, this process can be crucial when reflecting current changing environment. A strategic map of the faculty was elaborated as a foundation for further implementation of the total quality principles into the balanced framework for managing for the sustained success. The systematic process approach was used when connecting the quality and innovation in the strategic and operational activities of the faculty.

**Fig. 3: Simple strategic map of the faculty**



Source: elaborated by author, 2017

The requirements of ISO 9001 and the recommendations from ISO 9004 as well as strategic viewpoint of balanced scorecard were taken into account so that the processes from the internal perspective can be managed in accordance with the strategy. The quality and innovation were joined into the innovation-quality map and were integrated into the strategic map as a part of innovative processes in the internal perspective of strategic map.

**2.3 Discussion and proposal of the total balanced quality framework for managing for the sustained success**

The results of the analysis show that the best approach to elaborate a framework for total balanced quality management is to integrate the requirements of ISO 9001, recommendations from ISO 9004 and strategic performance measurement tool (Balanced Scorecard) into the total quality management (TQM) principles. The literature addresses the applicability of balanced scorecard concept to non-profit organisations (Al-Hosaini and Sofian, 2015) in improving performance effectiveness and enhancing service value to their customers. Universities can

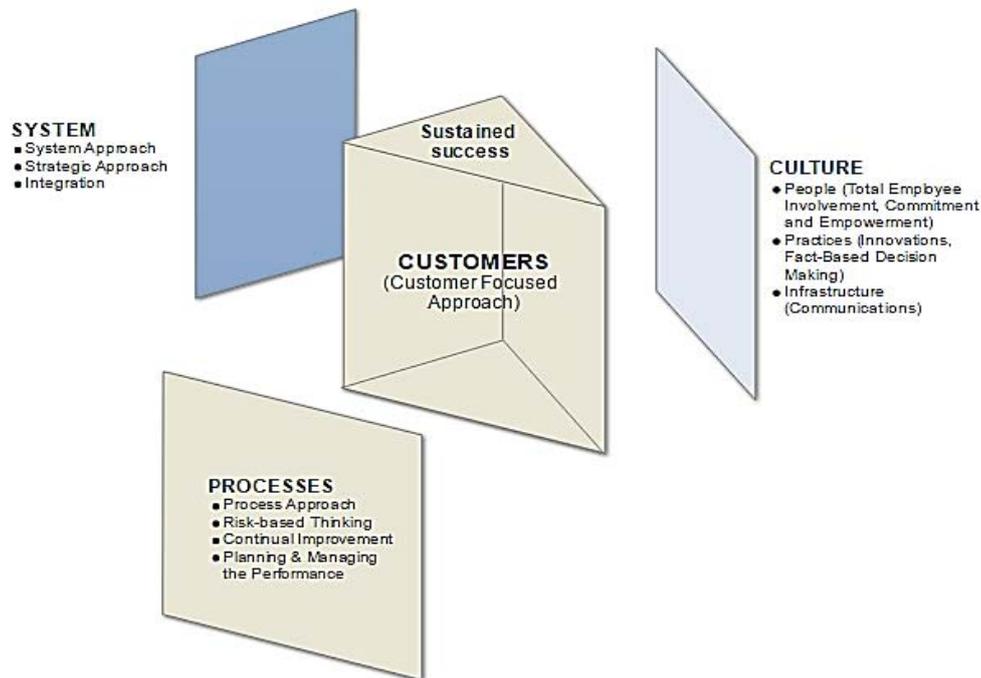
align the core values to address any emerging issues for improving performance measurement, to provide a clear structure for continuous quality improvement, to establish a culture of academic quality, to evaluate the efficient use of resources for each of the academic programs, to document the contribution of each activity towards the mission, promoting personal and academic excellence and to determine the priorities on future planning and needs assessment.

Using the conception of performance prism (performance measurement and management framework arising out of the work of the Centre for Business Performance at Cranfield University in the UK), the Total Balanced Quality Framework for Managing for the Sustained Success was elaborated and is visualised in the Fig. 4.

Total Balanced Quality Framework as seen in the Fig. 4 describes a management approach to quality and long-term sustained success. It consists of three mutually interconnected and balanced perspectives, following the principles of total quality management: 1. system perspective, 2. culture perspective, and 3. processes perspective.

In the centre of the framework is the customer, meaning that all activities of the organization (faculty) should be oriented on the customers (it includes the constant and continual analysis of customers' needs and expectations as well as setting the strategy to meet these needs and measuring the customers' satisfaction as the basis for further development of the actions and initiatives of the faculty).

**Fig. 4: Total Balanced Quality Framework for Managing for the Sustained Success of the faculty**



Source: elaborated by author, 2017

The system perspective includes the strategy as well as system and integrated approach to management of all activities towards the success. In the strategy, the four perspectives of strategic map of the faculty can be put in order to achieve sustained success. The integrated approach means the vision, mission (strategy) and processes altogether put in the quality management system and modelled after the ISO 9001 and 9004 standards (eventually the EFQM model or QFD). The culture perspective incorporates people and their total involvement, commitment, and empowerment (from the top to the bottom), practices (shared vision, mission and goals, innovations incorporated into quality in form of innovation-quality map and fact-based decision making in the activities, e.g. during the self-assessment or internal audits, also collecting and analysing the appropriate data in order to improve the decision making) and the infrastructure (e.g. good environment for work, high-performance IT systems, communication systems and communication ways, internal and external collaboration etc.). The process perspective covers the process approach (following the requirements of ISO 9001 and including the quality and innovation indicators), risk-based thinking (preventing the risks in the processes by constant analysis of the changing environment), continual improvement (exceeding the stakeholder expectations, quality-innovation map), planning and managing the performance (continual analysis and measurement, strategic map).

## Conclusion

The systematic approach was used when connecting the quality and innovation with the strategic and operational activities of the faculty. The quality and innovation were joined into the innovation-quality map and were integrated into the strategic map as a part of innovative processes in the internal perspective of balanced scorecard conception. Total quality management principles were incorporated into the framework following from the performance prism conception in order to propose the tool for sustained success management.

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## THE INFLUENCE OF DIVERSITY ON ORGANIZATIONAL EFFECTIVENESS

Laurencia Krismadewi

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### Abstract

**Purpose:** The study is conducted to investigate the diversity of personality's effect on organizational effectiveness and why diversity is important to business results. It, moreover, examines how they deal with challenges that appeared with employees from myriads of personality for adding value, creating the competitive advantages for organizations, and finding the bottom-line impact of diversity in the organization.

**Design/methodology/approach:** We relied on a variety of methods to obtain understanding through the sources that we encountered from qualitative and quantitative data of 80 respondents from Czech and Indonesia. The research applied snowball sampling method which data was gathered from 5 interviews of top management level. The prevalent complementary data sources included organizational records and journals.

**Findings:** The result indicated that workplace diversity played an effective role in some companies. The ability to innovate for managing diversity is vital to the survival of modern organizations in building a potent internal capital foundation towards the business challenges. There must be a regular improvement in ways to effectively manage a diverse workforce as the world keeps advancing through to adequate mentoring and guidance. Small-scale companies perceived it as a prudent and evitable alternative when they experienced it an impediment or unsuccessfully manage it.

**Research/practical implications:** The significance of teams in the successful functioning of the modern organization becomes a prominent capital for an organization to strive for the drawback of maintaining an impregnable competitive position in the business market.

**Originality/value:** The paper fulfils an identified utility to study how the diversity of personalities in team composition contributes to innovation at the project level in the organization.

**Keywords:** Business, Diversity, Effectiveness, Influence, Organization, Personalities

**JEL Codes:** M12, O31

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## **Introduction**

The development of modern industries, products, and markets stimulates the development of existing knowledge, skills and abilities. It supports the improvement of organizational competitiveness and contributes to the application of new technologies. Innovation is aimed to assist a business growing and improving its competitiveness. Furthermore, it is also a notable to plan in preparing innovation accurately. Knowledgeable and creative people in organizations frame the problems, select, integrate, and augment information to create understandings and answers through a process of innovation. Small- and medium-sized enterprises (SMEs) contribute to the diversifying economy. In comparison, some researchers recognized that SMEs were more innovative than the major ones (Gabsi, 2008; Stock, 2002), which also could not be separated from issues of conceptualizing, measuring, managing and improving the performance in organization. In terms of managing, the study of diversity in the organization as a causal factor of effectiveness has gained the prominence. In the paper, an attempt is made to highlight managing diversity for the benefit of researchers and practitioners. The study also provided the evidence regarding the effects of diversity management, such as creating a positive diversity climate in organizations.

The study examined the hypotheses *i.e.* diversity climate is positively related to employees' work attitudes, namely job satisfaction and organizational commitment that affect on organizational effectiveness.

## **1 Literature Review**

### **1.1 Managing Diversity**

Diversity is able to create more innovative and flexible teams which may increase their productivity and ultimately organizational performance. The concept of managing diversity for organizations is to increase awareness of cultural differences, to develop the ability to recognize, to accept and value diversity, to minimize patterns of inequality experienced by those, not in the mainstream, and to modify organizational culture and leadership practices (Soni, 2000). There are three principal reasons for managing diversity (Harzing, 2015:479) *i.e.* (a) Effective people management – Diversity Management (DM) creates an open inclusive workplace culture where everyone feels valued, which then helps to recruit, retain and motivate good people; (b) Market competition – A diverse workforce can support the organization to understand diverse customer needs, open up new market opportunities, improve market share and broaden its customer base; (c) Corporate reputation – Adopting an effective DM policy

enables organizations to demonstrate their commitment to CSR through engagement with local communities. According to Foster and Harris (2005:124), managing diversity displaced from an emphasis on procedural justice to a utilitarian approach that considers diversity management as a method to an end which should be managed strategically that identified a number key differences equal opportunities and managing diversity (see Table 1).

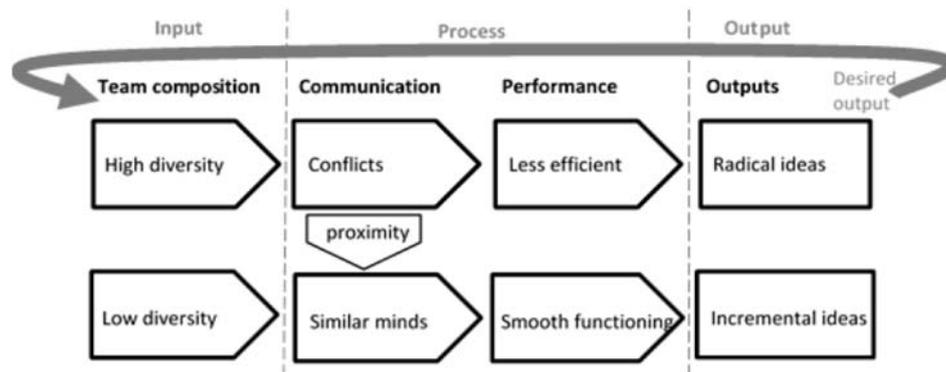
**Tab. 1: Key differences between managing equal opportunities and diversity**

Equal opportunities	Managing diversity
Addresses inequality through rights	Promotes diversity for organizational benefits
Neutralizes individual differences	Recognizes individual differences
Treats people the same	Treats people differently
A narrow view of difference	An inclusive view of difference
A focus on HR process	Concerns all functions of the organization
Promote assimilation	Promote variety
An emphasis on procedure and regulation	An emphasis on organizational objectives

Source : Foster and Harris (2005:124)

Existing studies have provided evidence to support the assumption that strategic diversity management can lead to enhance human resources outcomes which have a major impact on the competitive advantage for organizations (Harzing, 2015:480). According to Chartered Institute of Personnel and Development (2007:12), there is a wide range of measures that organization may use to monitor the impact of managing diversity. These include employee attitude surveys, number of complaints and grievances, labour turnover, employee performance appraisals, absenteeism, ability to recruit, number of tribunal cases, impact assessment, level of customer satisfaction, employee commitment surveys, business performance, balanced scorecard, diversification of customer base, improvements to problem solving and decision making, and psychological contract issues.

A dominant way of thinking about teams with respect to their capacity for innovation usually seems to be input-process-output models, in which variety of inputs combine to affect intra-group processes and, in turn, influence team outputs (Dlugoborskyte, 2015). The conceptual model based on the diversity as an input, team processes, and output on the performance of innovation (see Figure 1).

**Fig. 1: Conceptual model on composition and performance management of innovation**


Source : Dlugoborskyte, 2015

## 2.1 Organizational Climate

Organizations today are facing major challenges in terms of intense competition, workforce diversity, cross-cultural interactions, employee retention, innovation and productivity, and changing consumer preferences. Small-and medium-sized enterprises (SMEs) are a vital part of the economy. SMEs has a high potential of creating more job opportunities. This means that SMEs are too significant to national and local economic development since they have the potential to grow into big enterprises (Allan, 2006).

In the operation of SMEs, it is important for the management teams to review the success of their firms. This plays a significant role in determining the probability of the firm succeeding in the future. There are a number of success indicators that can be used for measuring the firm's success. One of the indicators that the firm should consider is evaluating the relationship developed internal the customers are employees (Anderson, 2009).

Employees are largely influenced by the organizational context in which they work. Specifically, their attitudes in the workplace partly depend on the types of climates with which they interact. One of such climates consisting of strategy, process, and ties, that would be diversity climate (Tidd, 2006). Managing organizational climate is a representation of employees' perceptions of organizational events, practices, policies and procedures. The study of organizational climate in social units is founded on Levin classic model in which it has been indicated that behavior is formed by interactions between people and their environments. In the study of Jaafari et al. (2012), it was identified the organizational climate is one major factor that effects on organizational effectiveness. Professional position or organizational environment create an atmosphere that affects the behavior of the members of that organization (Pourseif, 2006). Of the many studies and literature with different frameworks used, the researcher

adopted Prieto's framework for it was formulated for organizational effectiveness as a composite of varied indicators such as leadership, job satisfaction, and organizational commitment (Prieto, 2010).

## **2 Problem Statement**

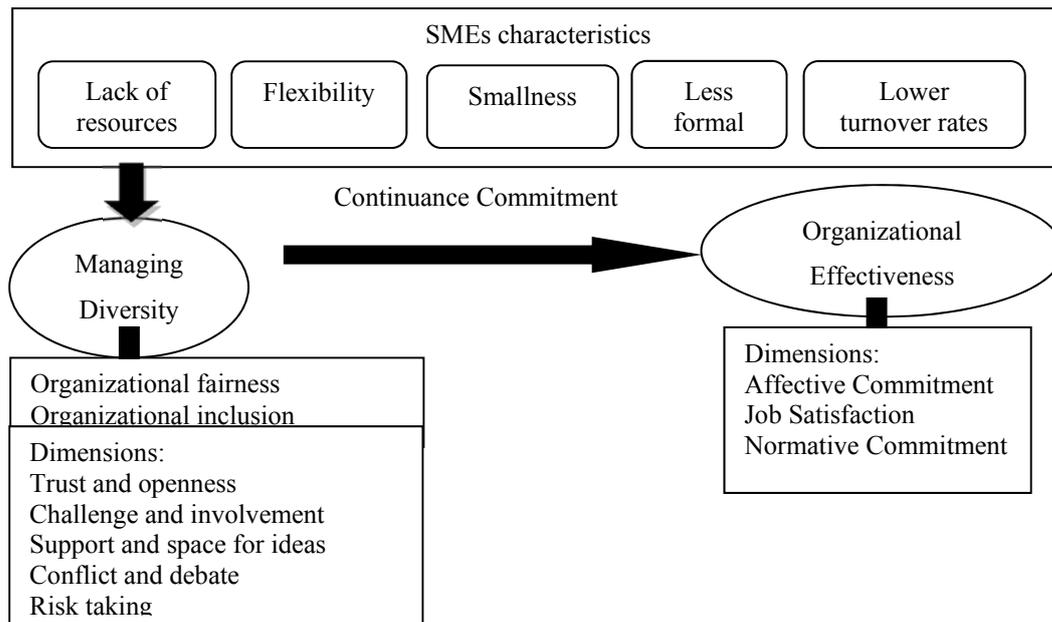
The main objective of the study is to analyze organization diversity innovativeness on organizational effectiveness. Author address and formulate two key issues in the study as follows:

- a) Does organization diversity have a significant effect on the organizational effectiveness in Czech?
- b) Does organization diversity have a significant effect on the organizational effectiveness in Indonesia?
- c) Does managing workforce diversity have a significant effect the organizational effectiveness in Czech?
- d) Does managing workforce diversity have a significant effect the organizational effectiveness in Indonesia?

## **3 Conceptual Framework**

Many smaller firms face resource constraints, and existing resources must consequently be used with care, as erroneous decisions will have more serious complications than would be the case in large businesses (Amelingmeyer and Amelingmeyer, 2005). For example, small firms have a flat structure and an organic, free-floating management style that encourages entrepreneurship and innovation. They tend to be informal, non-bureaucratic and there are few rules.

Most SMEs adopt short-term unstructured ways towards organizational learning and managers in smaller firms tend to prevent the outflow of knowledge of the company and thereby block knowledge sharing (Hutchinson and Quintas, 2008).

**Fig. 2: Research Paradigm**


Source: Author's concept

## 4 Research Approach

Our survey used information obtained through qualitative research in the preparation of questionnaires and quantitative data collection. To develop the questionnaire, we adopted a two-step approach. The first step (the pre-survey) is the subsequent investigation phase. We created an interview with top management and acquired the feedback on the subject and the research problem. The second step, we used questionnaire based on available literature, including a list of important topics for managing diversity and management. We then developed a survey questionnaire to verify the credibility of our advanced research hypotheses. The samples involved 40 workers both in Republic of Czech and Republic of Indonesia. In Indonesia, the prevalent name used is Micro, Small, and Medium Enterprises (MSMEs) rather than SMEs, nevertheless it refers to the same meaning. The data was collected from three largest sectors of SMEs in Indonesia *i.e.* agriculture, trade, hotel and restaurants, and manufacturing industry. The same data was gathered in the same areas as in Indonesia.

The study proposed:

*Hypothesis 1:* The organization diversity does have a significant effect on the organizational effectiveness with reference in Czech

*Hypothesis 2:* The organization diversity does have a significant effect on the organizational effectiveness with reference in Indonesia

*Hypothesis 3:* Managing workforce diversity does have a significant effect the organizational effectiveness with reference in Czech

*Hypothesis 4:* Managing workforce diversity does have a significant effect the organizational effectiveness with reference in Indonesia

The analysis involved the use of statistical software packages, SPSS. The qualitative analysis enabled the researcher to explore the core competencies each variable. On the other hand, the quantitative data analysis method was used in evaluating the extent to which dimensions have developed core competence in the variable. From the interview questionnaires, it was revealed that the employees have adopted different forms of managing diversity.

## **5 Data Analysis and Findings**

The organization was capable to adapt dynamic environment and maintain a competitive position in the market through combining organization's external and internal environment. It implied that the organization encountered increasing difficulty of management. It also signified that it was an arduous effort to bring in the new practice, methods, and operations. Diversity is a potential value of the organization that is oriented to making a profit in the unbalanced market.

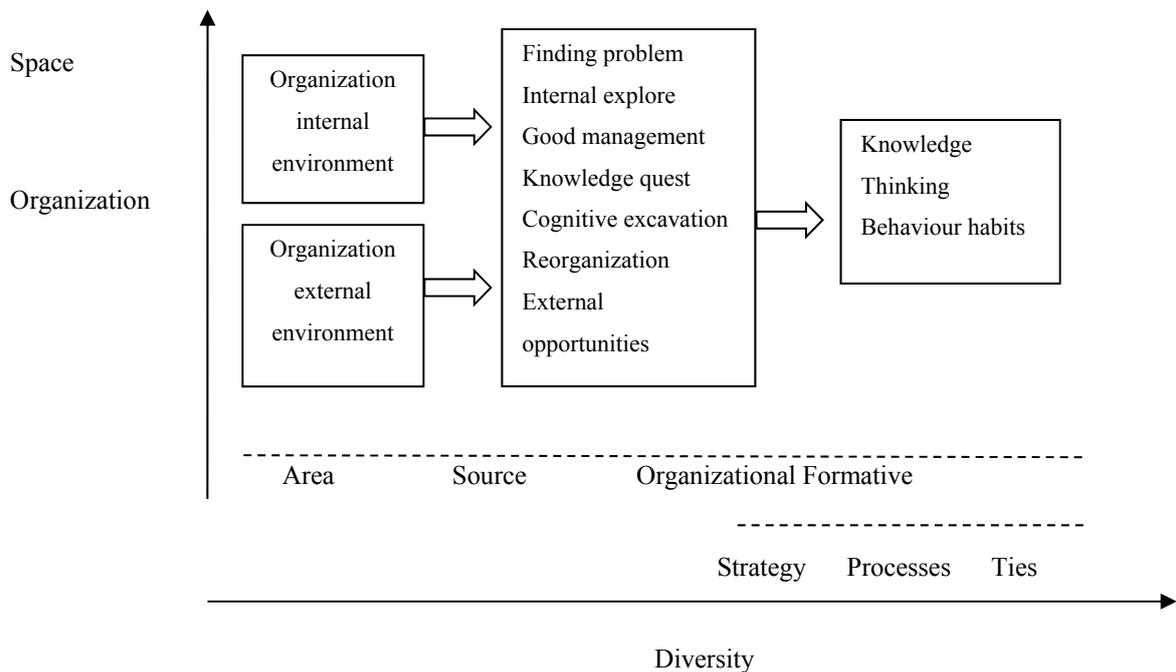
The findings of qualitative data based on a number of participants emphasized the relationship between diversity and organization. Most participants, at least, considered the possible impact of diversity on organizational performance even if they did not expect immediate impact, as in the following example:

Freedom of thought, the degree of autonomy and space for proactivity are important to enhance ownership and build teamwork within organizations. Management's concern to monitor and manage the diversity identified as capital is usually a very valuable asset the company own. (Cz).

However, trust and openness support employees because it contributes to organizational performance. Top management required to raise awareness of diversity within the company and minimize inequality patterns that can lead to internal conflicts. (Ind)

Following an analysis of attention shifts and organizations, experts conducted interviews and surveys. We propose a phase of diversity of innovation management as shown in Figure 3.

**Fig. 3 : The mechanism model of managing diversity**



Source : Author's concept

Descriptive statistics and intercorrelations among the variables are presented in Table 2 and Table 3.

**Tab. 2: Table of test of between-subjects Effects (Czech)**

Dependent Variable: Organization Effectiveness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.658 <sup>a</sup>	9	.295	.550	.026
Intercept	367.714	1	367.714	684.474	.000
Organization diversity	.843	3	.281	.523	.002
Managing workforce diversity	1.088	2	.544	1.013	.005
Organization diversity * Managing workforce diversity	.920	4	.230	.428	.787
Error	16.117	30	.537		
Total	767.000	40			
Corrected Total	18.775	39			

a. R Squared = .142 (Adjusted R Squared = .116)

**Tab. 3: Table of test of between-subjects Effects (Indonesia)**

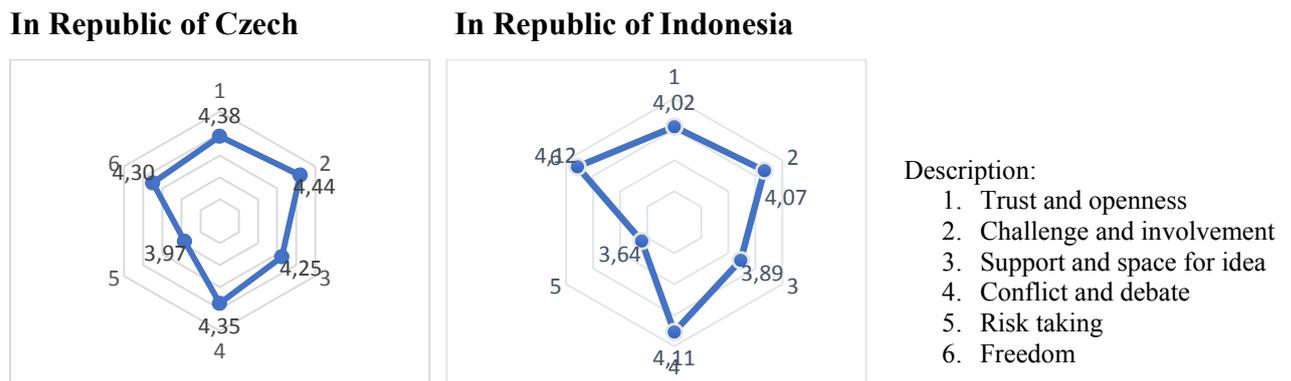
Dependent Variable: Organization Effectiveness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	4.650 <sup>a</sup>	10	.465	.568	.017
Intercept	253.457	1	253.457	309.485	.000
Organization diversity	.567	3	.189	.231	.014
Managing workforce diversity	1.239	2	.619	.756	.008
Organization diversity * Managing workforce diversity	3.293	5	.659	.804	.556
Error	23.750	29	.819		
Total	576.000	40			
Corrected Total	28.400	39			

a. R Squared = .164 (Adjusted R Squared = .125)

The important contribution of this research lies in the findings of organizational support perceived to mediate the relationship between factors of climate management diversity (see Figure 4). The study also demonstrated that a positive diversity climate is a beneficial investment that enable organizations to retain their employees that was indicated by the high level of trust and openness, chances and opportunities given, as well as the involvement of employees needed by the company. On the other hand, it signified that managing diversity climate did not strengthen in the factors of climate included freedom, support and space for idea, also the high level of risk taking. It exhibited that the organization could better provide more space for employees to develop, create and add their value. Related to the flexibility, it encouraged employees to contribute, take the initiative, and take a risk to build good management.

**Fig. 4 : Diamond model of managing diversity**



The figures above show that diversity management in the Czech Republic has developed a relatively high core competency in climate diversity compared to Indonesia. Another research finding showed that managers do not extensively educate their employees about diversity but become professional coaches for workers in completing tasks. They only tackle diversity issues when the need arises. There is a lack of open communication between managers and employees. As a means, managers use it to communicate with their workers. In addition, some managers are not able to effectively manage diversity and manpower due to the nature of the company and its activities that will reduce organizational performance. The companies mostly provided contact with the suitable employee they feel could perform well on a specific task. They do not take much advantage of the diversity in education and training but solely organize diversity melting pot.

The research highlighted diversity management that entails much more than provided the same opportunity for employment. In encouraging change, managers should recognize that change takes place at a slow pace; however, it is inevitable to proceed. Dealing with diversity also requires providing a secure environment for managers and workers to communicate, such as environments that include social gatherings and business meetings where every member feels comfortable to be and creates a friendly atmosphere to speak freely as well as listen to others. Mentoring programs should be implemented to guide employees on how to access information. Constructive feedbacks should be provided to the employees subsequent to they have learned from their mistakes and when they are successful in implementing the lessons learned to achieve success. This study reveals that valuing diversity can bring positive benefits to companies, such as the commitment and job satisfaction of their employees.

## Conclusion

The study's findings suggest that a positive diversity climate is a means of communication through which organizations can show their support for their employees, and in turn, can encourage employees to commit to the organization and be satisfied at their jobs. As it was proven in the results, managing diversity has a significant effect on the organizational effectiveness. The research is required on how to increase managers' awareness of workplace diversity and support their involvement in the implementation process. The diversity of individual assessments as individuals means respecting people as employees, customers, and clients. Managing of diversity is regarded as a better approach than EO because it adopts an inclusive approach that focuses on valuing people as unique individuals rather than on group-related issues covered by legislation.

The important thing for SMEs is to start with the basic of the innovative strategy to define the management system innovation strategy of SMEs, continuous adjustment, and optimization of enterprise resources (including human resources) in daily management, the process of configuration (and use), featured, and the system guarantee for promoting the competitiveness of enterprises. The ability for organizations to succeed depends on large part upon their ability to leverage their human capital. The author suggests reasons that diversity counts and their efforts serve as a framework on which to build. The limitation of the research also noted that the findings of this study will reflect the perceptions of the companies or organizations involved and not to be assumed as universally applicable to all companies in the end.

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## **BARRIERS OF USING CORPORATE SOCIAL NETWORKS IN THE CZECH REPUBLIC**

**Markéta Kubálková**

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### **Abstract**

**Purpose:** An enterprise social network can carry fast and efficient communication across the company, quick and easy sharing of information and knowledge. The main question is what are the barriers preventing greater expansion of ESN in the Czech Republic. The aim of the research is to identify the barriers that prevent the use of corporate social networks.

**Design/methodology/approach:** The research builds on two previous surveys conducted in 2015. They are followed by a questionnaire survey (2017). The aim of this survey was to determine what communication tools companies currently use. On the basis of the information obtained, qualitative research was conducted by the method of semi-structured interviews. Interviews were carried out with representatives of companies using corporate social network and representatives of the companies, which are engaged in deploying networks in companies.

**Findings:** Paper identifies barriers hindering the wider use of ESN in companies. Barriers that we can find in the implementation phase, launching phase, and utilization phase - on both the staff and management side. And present advantages of ESN as reduction of the number of e-mails etc., and presents disadvantages – although the use of ESN is simple, ESN deployment is complex and not always successful. Management support and the company's readiness to innovate is essential. It is necessary to create a communication and collaboration strategy, editing plan and establish rules of ESN use.

**Research/practical implications:** Results are relevant for the companies that want to use ESN effectively and realize the possibilities it offers – fast and simple communication and effective collaboration. Also, results are relevant for companies that want to deploy ESN.

**Originality/value:** The main added value of this article is to compile an overview of barriers of using ESN on the management and staff side and to compile an overview of recommendations based on expert interviews.

**Keywords:** Corporate social networks, barriers, Czech firms

**JEL Codes:** M14, M21

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## **Introduction**

The expansion of cloud computing and its increasing use by businesses brings, among other things, the advantage of relatively simple implementation of the services provided by cloud computing. More and more enterprises take the advantage of these services in order to increase competitiveness. It is important for corporate structures to respond flexibly to changes, to internal and external demands, and to be able to innovate. Innovation in information and communication technologies puts new requirements on business. (Duchon & Šafránková, 2008) Communication is the key element, employees must collaborate efficiently, share information across the organization, especially large companies are aware of this need. Fast and efficient communication across the company, quick and simple information and knowledge sharing can be provided by an Enterprise Social Network (ESN).

The topic concerns the field of innovation, specifically innovation in organizations, namely the introduction of new, previously unused organizational method which leads to improved communication and work environment. (OECD & Eurostat, 2005) Innovation is essentially creation of value and contribution to something new. (Drucker, 1993) Enterprise Social Networks contribute effectively to streamlining communication. Although ESNs have been available for many years, they are still ranked as new communication tools with high innovative potential. All activities of a company are important for innovation. (OECD & Eurostat, 2005) The potential of an ESN, however, can be used in full extent only in the event that employees are actively involved. The issue is to prevent the enterprise social network from becoming a passive instrument of internal communications, and resources for the introduction and operation of the ESN from being wasted. Adoption of this innovation by all employees is a crucial factor. It must be ensured that employees successfully pass all the stages of adoption process of the innovation as described by Rogers, including informing, persuading about the benefits of use until the stage of confirmation. (Rogers, 2003) We will examine corporate social networking issues on the basis of quantitative and qualitative research, and conclusions will be obtained from interviews with experts in the field.

## **Background**

One of the first social networks is Theglobe.com (established in 1995). Gradually, also other enterprise social networks emerged – currently, there are 44 of them. Namely, it is e.g. Chatter (SalesForce), Jive (Jive comp.), Connections (IBM), SAP Jam (SAP), Tibbr (Tibco Software), Social Cast (VMware). A widely-used enterprise social network is Yammer made by

Microsoft. The first big company to use ESN in the Czech Republic was CZC.cz company, which successfully implemented its network on the IBM Connections platform.

Enterprise social networks change the form of communication among employees of a company entirely and simplify their cooperation. They bring added value to companies with a larger number of employees where people no longer know each other; to companies with multiple management levels where the management wants to have overview of what is happens in the company; or in cases where there are expert groups within the company which want to keep and develop their common know-how. (Zitková, 2014) The whole organization takes part in such communication if the ESN implementation is successful (Hoyle, 2015). Using an ESN makes communication more flexible than in case of commonly used communication via e-mail. Information can be looked up more successfully and efficiently (Choudrie & Zamani, 2016). It is easier for employees to communicate across teams, and thus create more efficient natural structures. The maximum of information available to all employees encourage their activity and also the team spirit. ("CZC," 2013) Active participation of employees brings new perspectives, increases innovative potential of the company, and helps to identify natural leaders. An important aspect is also a simple way to react to shared information, and to gain feedback which helps to increase efficiency of the management. Establishing and deepening of relations at the workplace and creating a sense of belonging is also worth mentioning, as well as development of company culture.

Using public social networks (such as Facebook or Twitter) for such purposes is not advisable as communication between employees might contain internal data which should not be freely made public. One of the requests is to separate the private and work sphere of a company's employees. On the other hand, structure, design, and possibilities of enterprise social networks are inspired by public social networks, to make them intuitive to use for the employees, and thus to eliminate the need for special ESN trainings. Groups may create and share information, notes or files between their members. Groups can be either public which anyone from the company can join freely, or private, admissions to which have to be approved by a group administrator. (Barner & Barner, 2012)

However, deploying an ESN does not always bring the desired results. There are various issues to be solved on the way to using an ESN in a company effectively. "Companies have to answer questions such as: Why do we deploy a social network? What should be the benefit for us and how will we measure it?", says Martin Panák, Microsoft product marketing manager, about one of the most important criteria. (Zitková, 2014) Such a project needs support from the management of the company and it is advisable for management to take an active part in it as

well. It is essential to provide employees with motivation and quality training (Martoch, 2012). Buettner also emphasises the relation between users' concern for their privacy and perceived usefulness and simplicity of use. (Buettner, 2015) According to Roe, fragmentation of services into different applications prevents ESN from being used to its full potential – the employee uses e-mail, chat, cloud storage, ESN. It is important for the ESN to be seen as a beneficial part of the daily routine (Roe, 2014).

## **Solutions**

Recently, I have been addressing the issues of corporate social networks since 2015 as part of my research topic Effectiveness of cloud solutions, mainly focusing on their effective utilization, identification of the type of contributions shared, and also on how to identify and overcome barriers of their use. The topic of effectiveness of ESNs is addressed by multiple authors in different regions for different types and sizes of companies. Li and Charlene (Li, Charlene, 2015) put emphasis on the involvement of the company's management, listening to employees, openness to employees' opinions, on rapid response, feedback, and information collection. Focus on information sharing is considered important (Hoyle, 2015).

In my research, I refer to the survey carried out in March and April 2015 focusing on use of the corporate social network called Yammer and its contribution to internal communication in companies where ESN has been introduced. Conclusions are as follows: e-mail is considered the main communication tool in companies. ESNs are used by less than 20% of employees. Respondents indicated the following advantages of using ESNs - simple informal communication, fast and efficient information sharing, effective coordination work groups and global projects. The results showed that successful deployment of an ESN does not lead to the successful adoption of this solution.

Another ground is a survey dated November 2015 the aim of which was to analyze the use of Yammer at University of Economics, Prague and identify the type of shares. Conclusions are the following: For better user involvement, it is recommended by experts polled to inform, train, and individually invite employees to participate. At the same time, they must also see the involvement of management and executives. Management is encouraged to reply to employees' posts shortly and praise them for the posts. And by doing that, step by step, to activate employees to use the potential of ESNs.

## **Communication tools and ESNs**

The aim of the current research is to identify problematic areas hindering wider use of ESNs, to compile a list of recommendations for overcoming the barriers of use, which in turn will lead to the exploitation of the ESNs potential. Two surveys were carried out to fulfil the targets - quantitative survey, and qualitative research based on structured interviews.

### **Communication tools and ESNs in the Czech Republic**

The questionnaire survey serves as an information base for qualitative research. The aim of the survey was to determine what communication tools companies currently use. Also, if a company uses a corporate social network, to analyze the current status and perceived pros and cons. The survey was conducted in February and March 2017.

Method of systematic random sampling were interviewed 129 companies from two databases, operating nationwide educational organizations, in order to reach out to well-established representatives of companies. The sample included companies from 7 regions of the Czech Republic. 51 respondents were evaluated. Half of the respondents are represented by large companies with over 250 employees (53%), medium-sized companies of up to 250 employees (20%), small businesses of up to 50 employees (22%), and micro businesses (4%). In order to obtain accurate statistics on the use of communication tools by companies in the Czech Republic, it is necessary to continue the research with a representative survey. Still, the survey provides interesting results. Not surprisingly, the majority of respondents states that the main communication tool within the company is e-mail (98% of respondents), followed by telephone (96%) and personal contact (90%). Further, chat services are used (Skype, Facebook Messenger) (53%), corporate social networks (27%), and public social networks (16%). ESNs are currently used by 13 companies from the sample (10 large companies, one medium-sized firm, one small company, and one micro-company), 2 companies are preparing to deploy an ESN (large companies), and two companies are considering deployment of an ESN (large companies). Companies considering the deployment of an ESN stated that the main reasons are efficient communication, simpler information sharing and information retrieval, more efficient teamwork, and restriction unofficial information sharing. If a company uses an ESN, the most common tool is Yammer (7 companies), IBM Connections and Chatter are also represented.

Respondents are divided by frequency of use of ESNs. Less frequent use of ESNs prevails - daily or several times a week ESN use is common in 4 companies - these are large companies in one of which ESN use is mandatory. These companies are rather or completely

satisfied with the ESN. The main advantage considered is accelerated troubleshooting. A disadvantage is that people do not ponder over issues and ask for advice directly, or they expect immediate response which is considered disturbing.

A number of 9 companies use ESNs several times a month or less frequently (mostly Czech companies, 3 foreign companies). 6 large companies (one with mandatory use), 1 medium-sized, 1 small, and 1 micro-enterprise. All companies are rather or completely satisfied with the ESNs. According to the respondents, the advantages of an ESN are a modern, fast and open communication, simple sharing including large files, identification of users, a single place interest when searching for news, information, documentation, etc. The disadvantages of the ESN are mainly in the fact that it is not used by all of the employees, and that certain information is shared only within closed groups. The main barriers to wider uptake of ESNs are unwillingness or low motivation to participate, low awareness, insufficient or uninteresting content, fears of information leaks, fears that posts are not anonymous.

In order to obtain relevant results for regions of the Czech Republic, business types or sectors, research needs to be continued by representative research.

### **Barriers of ESN use in the Czech Republic**

Based on the output from the aforementioned survey, qualitative research was conducted. Experts on the issue of barriers to effective utilization of ESNs were addressed. The method of semi-structured interviews was chosen, which allows to prepare structured questions, however as the case may be, the order of the questions may be changed or further questions may be added to utilize the full potential of the respondents. (Reichel, 2009)

In this case, 5 interviews were conducted. The respondents were experts in the field: respondents A and B are representatives of the companies, which are engaged in deploying networks in companies, respondent C is a representative of a ESN vendor, respondents D and E are representatives of companies using ESN.

Respondents: (A) Manager of cloud-based technologies (ESN) deployment in companies (6 companies analyzed), (B) Consultant of a company engaged in consultancy in the field of IT - including deployment and effective use of cloud technologies (3 companies analyzed), (C) Product Marketing Manager of Microsoft, (D) Head of Technical Department of a multinational company where the ESN implemented is not effectively utilized, and (E) a representative of multinational company where ESN is successfully used.

The interviews were conducted in March 2017 as a personal interview in respondents' office. The average length of a personal interview was approximately two hours. The interviews

were recorded in paper and pencil format and rewritten into the computer. A summary protocol was written, the data reduction was made and the general response was constructed. These were categorized into categories. Barriers can be divided into barriers in implementation phase, launching phase, and utilization phase barriers of the ESN. Barriers are on the side of management or employees - see Table 1.

**Tab. 1: Barriers of using ESN**

	<b>management</b>	<b>employees</b>
<b>Implementation phase</b>	lack of vision It was not sufficiently specified what is expected from implementation of the ESN no specific business problem to be solved by the ESN reason implement the ESN was only to follow the leaders belief that introduction of the ESN would encourage people to communicate management is not an active participant in the changes weak management support	wrong understanding of the purpose need to repeatedly enter login data
<b>Launching phase</b>	insufficient explanation or communication of the purpose insufficient promotion not specified which tool to use for which type of information structure of the information inserted not specified no involvement of the management no principal theme specified effort only to "push information" no feedback given lack of employees' posts appraisal	wrong understanding of the purpose unwillingness to accept innovation lack of training unwillingness to learn conservativeness effort not to be noticed privacy protection optional use of the ESN uninteresting content
<b>Utilization phase</b>	unwillingness to share one's know-how protection of own knowledge in order to increase one's price uninteresting content decrease in interest (massive promotion in the launching phase, e.g. prize competitions, with time interest in the "new thing" falls) duplicity of information in different communication tools and fragmentation of information across various applications lack of time for less formal activities	
	lack of employees' posts appraisal concerns about formation of natural leaders	

Source: Own elaboration

Technical issues were also mentioned. ESNs offer options that are often available in other instruments (e.g. Yammer - SharePoint). Tools for communication and collaboration are fragmented, search engines are separated in different instruments and do not provide an overall view. Certain tools do not function correctly in all the commonly used browsers. Financial issues do not play a significant role, respondents do not perceive them as a barrier. In the case of successful ESN implementation, the respondents find the following benefits: reduction of the number of e-mails addressed to multiple recipients, prevention of information loss in e-mails, information is gathered in one place in a single application, natural but structured connection between people, simple search, consistency of information, efficient work on tasks. The ESN functions as a knowledge pool or idea platform for new employees, manuals are easily created from the shared information. Natural leaders come out thanks to the ESN. The official information channel replaces informal verbal exchange of information. Furthermore, given by similarities with public social networks, interface is familiar and intuitive for the users. Users showed positive response to a mobile application.

Use of an ESN is largely dependent on the content which must be beneficial and interesting for the employees. The examples reported are invitations to trainings, information on company-wide events, reactions to proposals, comments, discussions on customer requirements. Nevertheless, the discussions are not merely of formal character. An interesting example is involvement of unions, or purely private information of employees - e.g. children clothes exchange.

Deploying an ESN does not always bring the desired results. Based on interviews with experts, it is possible to specify barriers in the phases of ESN deployment and barriers on the side of management or employees. As shown by the results, the role of management at all stages is crucial.

## **Results**

How to overcome the efficient ESN use barriers stated in Table 1?

– Barriers at ESN implementation phase

On the side of management, it is necessary to specify precisely the vision and the particular reasons for the ESN implementation, what the expectations are, which particular issues are to be solved, and also whether the company has adequate conditions for the change – in terms of business, technology, and human capital. It is advisable to use a partner or mediator for ESN implementation. Management must be actively involved in the change.

On the employee side, the barriers are overcome by removing technical issues and by consistent communication of the implementation purpose. It is necessary to inform employees about the upcoming changes through various channels already in the phase of implementation.

– Barriers at ESN launching phase

On the management side, barriers are removed by permanent communication of the purpose. Employees must be informed not only by electronic means - e-mail announcements on the intranet, but also in the form of printed flyers and posters placed where people would actually read them (e.g. dining room). Management must be active permanently and appreciate involvement of employees. Communication must be under control and rules need to be set. It must be clear which instrument should be used for which type of information (what information to share on the intranet, when to use chat or e-mail, which information to be inserted into the ESN, shared data storage, or other instruments). This information should be stated in communication and collaboration strategy. It is suitable to describe specific situations in the form of examples of use of a particular channel. It must be clear what information in what structure should be published (for each department) in editorial plan. At the launching phase of an ESN it is helpful to choose a principal theme that would interest and attract enough people (to bring a discussion topic that moves the organization, e.g. a core business issue, offering direct communication with the top management).

If the management communicates the purpose adequately and if the principles of use are set appropriately, employees should be trained. The principal topic should then draw the employees into the process and the beneficial content should keep their interest. At the beginning of the process, it is advisable to encourage active involvement of employees and continuously appreciate their activity.

– Barriers at ESN utilization phase

At the utilization phase, there is a threat of interest drop on the side of the management. That does not occur if management feels that communication within the ESN helps resolve business issues. Another issue is how the management faces the possibility of creation of natural leaders. The solution is that managers themselves should have the ambition to become natural leaders. If certain issues occur, if active employees are not appreciated, and instead if activity brings them additional load, then the company is not ready to use an ESN.

Other barriers observed appear on the side of employees as well as on the side of management. Efforts to protect own know-how and thereby increase own price are removed by rewarding the contributors. Interest of employees is maintained by discussing the topics that help resolve business issues and bring results. The more active the employees, the more

interesting the content, therefore the more probable that the employees will find time to communicate and share. The expert from the company where ESN has been implemented successfully states that employees start the ESN immediately after arriving at work to find out what is new. It is not necessary to remove private information from the structure - see the aforementioned example of children clothes exchange. However, it still necessary to control the debate and structure it appropriately (private discussions must not mingle with corporate communication). Duplicity of information in different channels may be prevented by precisely specified communication strategy and its compliance without exceptions.

## **Conclusion**

Based on the aforementioned findings, the following recommendations on how to overcome barriers of effective use of an ESN are presented. According to interviewed experts and representatives of companies is a fundamental attitude of management. Before deciding on implementation of an ESN, the management must answer the following questions: What is our vision? What benefits do we expect? What reasons lead us to such solution? What business issue is to be solved? In what case the implementation should be considered successful?

ESN can be used as a communication tool, but real benefits can be expected if we use ESN to address a specific business issue. In addition, management has to answer questions: Do we have the information that we need to share? Is the ESN supported by the management? Is there a person who will act as a motivator in the company? The change must go through the whole company. Experts agree that management support is essential. Management must be actively involved. It is efficient when the promoter is a top management member, whose example will follow others. The intention should be promoted and communicated from the very beginning. It is necessary to create a detailed communication and collaboration strategy - which communication tools to be used for which type of information. It is necessary to create an editing plan - in what structure the information should be published. It is necessary to establish rules of use. The strategies, plans and rules must be respected. When launching the ESN, it is recommended to choose a principal topic that will interest and attract enough individuals. It is necessary to control the communication and reward active involvement of employees.

Businesses feel the necessity to improve communication and internal information sharing. An ESN may serve as an appropriate tool, especially when communication runs across various departments not respecting the organization structure. In case a company decides for ESN implementation, it must be considered a step for change of the organization as the whole,

as a necessary innovation. “These are innovations that influence and often determine the effectiveness of economic entities and their development.” (Veber, 2016, p. 78)

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## RESEARCH AND DEVELOPMENT PERFORMANCE MANAGEMENT AND MANAGERIAL TOOLS

Marie Kubáňková – Jaroslava Hyršlová – Jan Nedělník

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### Abstract

**Purpose:** Economic competitiveness is becoming increasingly linked to rapid technological changes. New technologies are crucial for long term competitive advantages. R&D is a key strategic issue that must be aligned with the corporate strategy, therefore there have been considerable changes in the way that R&D has been managed over recent years and measuring R&D performance has become a key issue that has been extensively debated in innovation and R&D management literature. This paper provides current and up to date knowledge in the field of R&D management and strategic management accounting.

**Design/methodology/approach:** The purpose of the paper is to identify management tools used in R&D performance management in a selected sample of companies, and to compare them with the findings in the literature and identify the practical impact of the R&D outputs. Therefore, a questionnaire survey will be used to demonstrate this. SMEs members of Association of Research Organizations (AVO) were selected to answer research questions. Telephone interviews were provided by the agency STEM/MARKT. The data was then entered in electronic form into the program ENGRAFES 1.0 and statistically processed.

**Findings:** The survey shows that the selected sample of the Czech companies uses similar indicators comparable with indicators of foreign companies for managing the performance of research. The most problematic areas of R&D management are clearly indicated as the consistency of the long-term targets of R&D projects with the strategic and financial objectives of the company, and improperly set types of R&D management, poor organizational structure, and a division of competences.

**Research/practical implications:** R&D generates knowledge that is crucial for the long-term competitiveness of the companies. Thus, huge financial amounts are invested in R&D activities. The R&D performance management and managerial tools have become a challenge for both managers and the research community. The paper focuses on the management of R&D. This paper also responds to the challenges of strategic management accounting, and its minor impact on the practice and the lack of literature on the use of specific tools.

**Originality/value:** The added value of this paper is to extend the existing knowledge concerning the strategic management accounting tools used in the management of R&D performance in selected Czech companies, and how it compares with foreign samples.

**Keywords:** research and development, performance management, strategic management accounting

**JEL Codes:** O32, M10, M20

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## **Introduction**

The theory of business entities based on resources shows that a long-term competitive advantage depends on knowledge, ability to innovate and develop, utilize and restore basic resources (Bremser and Barsky, 2004). Businesses therefore need to pay close attention to the identification of new factors that are crucial for their development. Competitiveness is closely linked to new technologies and having knowledge that the competition does not possess. Knowledge is becoming more and more crucial, and the main production factor to economic growth and competitive advantage. Research and development (hereinafter R&D) are the main source of this knowledge (Kim et al., 2011). These facts, when put into practice, were confirmed by a number of companies (Pearson et al., 2000; Chiesa et al., 2009). One of the first intentions to investigate the management of R&D put Freeman (1969). Effective method of managing R&D both in the private and government sectors is of great interest to academic studies (Nixon and Burns, 2012).

Small and medium-size enterprises (hereinafter referred to as SMEs) are considered an important sector, which is the source of economic growth and wealth in society and for the creation of new jobs, especially in the "new" economic sectors dependent on new technologies (Coyte et al., 2012). Despite the importance of SMEs in economic growth of society, there is insufficient attention paid to them in the literature.

SMEs react and adapt more flexibly to new and changing market conditions. Thanks to a simpler management structure they are now "closer" to the customer. They put greater emphasis on the customer than on strategic planning (Coyte et al., 2012). Increased involvement in R&D activities leads to the fact that SMEs typically achieve higher productivity of R&D in comparison with large companies and deal with more complex tasks (Tierlinck and Spithoven, 2013). Tuomela (2005) says that R&D management systems used in large companies are not significantly widespread among SMEs, where R&D management is carried out more on the basis of trial and error rather than on professional management (Gassmann et al., 2010). The specifics of SMEs concentrate on what management tools are used in knowledge management, and for the management of R&D performance (Coyte et al., 2012).

The paper links the current understanding of the field of R&D management and its aim is to identify the key challenges of R&D management and to identify the tools used in R&D performance management in a selected sample of SMEs in the Czech Republic.

## 1 Reference framework

Among the criticised aspects of existing approaches to R&D performance management belong a mainly short-term focus, and a preference for short-term goals at the expense of long-term goals (Pearson et al., 2000). Yawson and Sutherland (2010) highlight the lack of attention paid to measuring the performance of R&D within individual projects and the lack of tools for strategic decision making (with the aim of ensuring consistency between the objectives of R&D and strategy of the company) (Pearson et al., 2000; Bremser and Barsky, 2004).

Among the main objectives of the R&D performance management systems is the ability to respond flexibly to a rapidly changing environment (Tierlinck and Spithoven, 2013). Also, to ensure the transformation of the long-term objectives in the field of R&D into operational activities, set the system for evaluation and motivation of researchers, stimulate education and support processes of the learning (Chiesa et al., 2009). The correct adjustment of goals is the most significant activity to manage R&D performance, as the process of performance management is always considered as goal-oriented, in which the basic quality category is the significance of the performance information to the users. One of the most important issues of R&D performance management can be considered as the correct definition of goals to involve researchers, and the provision of operating management and learning processes (Chiesa et al., 2009). Management accounting offers a number of techniques which show the added value of a specific product or project in relation to the added value of the company. It also provides an option to clearly set the limits; in particular regarding the budgets and calculations (King et al., 2010).

The issue of indicators used for performance management of R&D has been researched by Bremser and Barsky (2004). The results indicated that the most commonly used indicators are following:

- R&D costs as a % of sales,
- Total R&D costs,
- Fluctuation of R&D employees,
- Total number of realised projects,
- Number of successful projects,
- Percentage of sales which are contributed to by new products,
- Total costs of successful projects,
- Number of filed/granted patents,
- Number of other measured R&D results,

- Average costs of new product development.

Based on the reference framework and in line with the main aim of the paper, the following questions were asked:

1. The first partial objective is to identify the key issues of R&D performance management in selected samples of SMEs in the Czech Republic. The research question was formulated as follows: *Which areas in R&D performance management are the most problematic?*
2. The second partial objective is to identify the management accounting tools used in R&D performance management in a selected sample of SMEs and to compare them with the tools used abroad. The following research questions were formulated: *Do the important indicators of R&D performance management used in praxis of foreign companies significantly differ from those used in selected samples of SMEs? Do SMEs use budgets and costs calculations in R&D performance management?*

## **2 Methodology**

To achieve the above objectives and to answer the research questions, study of used research methods was realized. Al-Ashaab et al. (2010) used the quantitative research – a questionnaire survey – to obtain information about the company's experience with the use of specific managerial tools; Bhimani and Langsfield-Smith (2007) used this method to determine the financial and non-financial indicators for strategy implementation. To fulfil the objectives of the paper and to answer the research questions a questionnaire survey has been made with carefully chosen questions. The research progressed in the steps commonly used for this type of research. In the first step the base survey population was selected. The only association in the Czech Republic that represents the R&D in the business sector is the Association of Research Organizations (AVO). SMEs that are members of AVO were therefore selected for quantitative research. Furthermore, the technique of information gathering was selected and a pilot study was performed in order to verify if the required information is achievable. Repeating the same or similar questions in the pilot study and within own research could distort the respondents' answers, therefore for the pilot study a group of companies associated within the Moravian-Silesian Energy Cluster and the Moravian-Silesian Timber Cluster was selected. The rate of questionnaire return within the pilot study was 38%. The pilot study confirmed that the questioning of a selected sample of SMEs can identify problems in the R&D performance

management and confirmed the ability to acquire information on tools used within R&D performance management.

The final questionnaire included 14 closed questions (yes – no), 11 scale questions (rating scale), and five open questions. For the realization of the questionnaire survey the agency STEM/MARKT was used, questioning was conducted via telephone interviews. The interviewees were informed that the questionnaire survey is designed for top managers or R&D managers.

Of the 73 companies that were interviewed (out of which were 64 SMEs), that make up the membership of AVO, 39 companies were involved in survey (out of which 33 were SMEs). Only the SMEs data was analysed. Therefore the return rate was 52%. The results were processed using statistical methods.

### **3 Results**

The respondents considered the most problematic areas mainly as the following: inappropriately set style of R&D management (inappropriate organisational structure and competences division) and way of evaluation of effectiveness of specific R&D projects. The respondents considered the least problematic setting of goals of R&D projects and R&D staffing. Detailed results are summarised in Table 1.

The survey showed that, for the evaluation of R&D performance, the respondents used the indicator *the number of successful projects*. The respondents also used these indicators: *the total R&D costs*, *the total number of realised projects*, *the percentage of sales which are contributed to by new products* and *the total costs of successful projects*; those indicators are used by more than 93% of respondents.

**Tab. 1: Problematic areas in R&D performance management**

Area / Relative frequency of response	Yes	Rather yes	Rather no	No
Consistency of long-term R&D project goals with strategic and financial goals of the company	33,33%	12,12%	39,39%	15,15%
Setting management processes in order to ensure consistency of long-term and short-term R&D goals	6,06%	36,36%	39,39%	18,18%
Evaluation of effectiveness of specific R&D projects	18,18%	39,39%	27,27%	15,15%
R&D employees motivation to achieve project goals	3,03%	33,33%	33,33%	30,30%
Inability to learn from completed projects and thus repeat errors in the management of R&D	6,06%	31,25%	40,63%	21,88%
Insufficient R&D staffing	3,03%	27,27%	39,39%	30,30%
Unclear or unspecific goals of R&D projects	0,00%	21,21%	36,36%	42,42%
Inappropriately set style of R&D management, a poor organizational structure, division of competences	24,24%	30,30%	24,24%	21,21%

Source: Authors

More than 95% of the respondents continuously evaluate the usage of budgeted costs, and evaluate the revenues (benefits) of the projects. Almost 94% of the respondents develop a calculation of preliminary costs and revenues, and over 90% of the respondents also prepare the final calculation of costs and revenues after completion of the projects.

21% of respondents also used other tools within management of R&D projects, especially to evaluate employee productivity, the return of invested funds, and the benefits of each project (eg. reduced scrapping, reduced energy consumption, reduced environmental impacts, increased production capacity etc.)

## Conclusion

The current level of global competition requires a comprehensive approach and a fast response; the management of R&D must respect the type of research activities, and must be closely linked to the company's strategy. The results of the survey confirm that the most problematic areas of R&D management are as follows: inappropriate organisational structure and competences division, unsatisfactory methods of evaluating the effectiveness of R&D projects, improper setting management processes that do not even enable to achieve consistency between long-term project goals and the strategic and financial goals of the company. Even consistency between long-term and short-term goals of R&D activities is affected. The selected sample of SMEs uses tools of management accounting for R&D performance management, which are

applied in the practice of foreign firms; most of respondents use costing and budgeting within R&D performance management.

These conclusions agree with the findings:

1. Bremser and Barsky (2004), who state, that the most significant problems faced by R&D performance management are achieving the consistency of R&D strategy with the business strategy of the company which is focused on the growth and consistency of long-term and short-term goals in the area of R&D,
2. Yawson and Sutherland (2010), who confirm, that there are only a few companies which can transform strategic goals into operational goals and evaluate their contribution to the added value and performance growth,
3. Sohn et al. (2007), who consider one of the most significant problems of R&D projects management as being the suitable system of internal processes management.

The main limitation of realised research is the chosen method. The questionnaire survey was carried out in a selected sample of SMEs, the conclusions therefore can't be generalised. The findings and examples of good practice can be taken as a guide to a variety of businesses. They can be applied in a variety of companies operating in different conditions. During further research, a space appears for the realization of the survey in a range that allows for statistical generalisations or space to implement the survey to another group of SMEs (eg. beneficiaries of subsidies under the programs of Technology Agency of the Czech Republic), and to compare findings.

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## EMPLOYMENT OF FOREIGNERS IN POLAND FROM THE POINT OF VIEW OF ENTREPRENEURS - OPOLE VOIVODESHIP STUDY

Sabina Kubiciel-Lodzińska

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### Abstract

**Purpose:** The subject of the studies presented in the article was an assessment of the demand for employment of foreigners in companies based in Opole Voivodship. They aim was to establish the reasons which have made, or could make, them employ foreign workforce; to obtain information on the benefits and difficulties connected with using foreign workforce. They are focused on getting a regional preferences map of employers when it comes to employment of foreigners.

**Design/methodology/approach:** The study involved managers, i.e. owners, directors, managers or people responsible for personnel policy in enterprise. Combining qualitative and quantitative research methods were used. In the research was used a structured questionnaire interview. The study included 263 employers and were carried out in late 2014 and in early 2015.

**Findings:** It was established that the lack of native workers is the main reason why foreign workforce is more and more widely used. The most valuable advantage obtained thanks to employing a foreigner is acquisition of a worker who holds skills that are in demand. Most difficulties by hiring foreigner have the entrepreneurs with complicated law regulations.

**Research/practical implications:** The research showed the need for developing services connected with job placement of foreign workforce. This can be acknowledged to be a chance for the appearance of a demand for specialist services rendered to immigrants, such as translation of documents, accommodation agency, tax agency. Wage earning immigration can thus become a significant factor stimulating development of entrepreneurship.

**Originality/value:** The studies proved that there exist differences in determiners, barriers and advantages which come from employment of foreigners depending on the size of the company. This is a significant methodological establishment in the context of realization of studies of migration in enterprises, which points to the necessity of introducing a division of the examined firms according to the number of the employed workers.

**Keywords:** labour market, labour demand, entrepreneurship, immigration, foreigner, Poland

**JEL Codes:** J23, J42, J61

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## Introduction

Poland is becoming an immigration destination to a greater and greater extent nowadays, in particular including the wage earning migration (Górny et.al., 2010). The influx of foreign workforce is stimulated, among other things, by transformations going on in the Polish job market, which result from wage earning emigration of the native workforce and changes in the preferences of youth, relating to education and occupations. In consequence, there has been a deficit in the number of workers in certain branches (among others, construction industry, industry, services) and occupations (especially those which, as a rule, require physical exertion). A significant influence on the image of the job market is also exerted by the process of aging of Polish society.

Similar changes are observed in other countries of Central and Eastern Europe, which results in a growing number of studies and analyses dealing with immigration, including in particular the wage earning one. They are carried out, among others, in the Czech Republic (Janská et al., 2013), Slovenia (Botić, 2016), Slovakia (Blazek, 2015), and Hungary (Jakobi 2010). Employers in the CEE countries have become the subject of a number of studies as job creators (Veen, Kratzer 2011; Cieślik et. al., 2014). Studies referring entrepreneurs as a force for attracting foreign workers to CEE countries are new topic of research (Piotrowski, 2014, Kubiciel-Lodzińska, 2016). Migrants accounted for 70% of the increase in the workforce in Europe over the past ten years and fill important niches both in fast growing and declining sectors of the economy (Effiom, 2014).

The aim of this article is to present selected results of studies conducted among entrepreneurs in Poland (precisely in Opole Province) connected with the demand for work of foreigners. The analyses were meant to verify the following hypotheses:

**H1:** Entrepreneurs employ foreigners since there is a lack of native workers who would be ready to take jobs on offer.

**H2:** In the opinion of entrepreneurs, complicated regulations pose a barrier to employing foreign workers.

**H3:** Entrepreneurs who take advantage of foreign workforce want to secure stability of employment.

## 1 Data

The studies, the selected results of which are discussed in this article, have been carried out in enterprises in the Opolskie Voivodeship. Studies were carried out in late 2014 and in early

2015. Opole Province is characterised by a long-standing tradition of departures (usually abroad) having social, demographic and economic consequences. The Opolskie Voivodeship has become a kind of a "laboratory" for the study of migratory processes, in particular economic migration. For several years, this has also been a region where research work on foreign migration, mainly economic. The Opolskie Voivodeship is the first region in Poland where it was necessary to launch a programme to address the problem of population decline. One of the objectives of the programme was to stimulate immigration (Kubiciel - Łodzińska, Ruszczak 2016).

The understanding of determinants and effects of foreign economic migration into the Opolskie Voivodeship is constantly being broadened. When the sample was selected, it was not expected to be representative in relation to the generality of enterprises in the region. These are the first studies carried out in the Opolskie Voivodeship including both employers having experience with foreign labour and employers without such exposure. Previous analyses carried out in the region incorporated only those entities that employed foreign labour.

As it is recommended in literature combining qualitative and quantitative research methods were used (Fayolle, Landstrom, Gartner, Berglund 2016). Respondents were contacted in several ways. Firstly, via an on-line survey (CAWI method) sent to all members of the Opole Chamber of Commerce (479 companies), Klub 150 (199 companies), participants of the international research project pursued by the Opole University of Technology and the Opole University (200 companies), and those featured in the database of the Opolskie Voivodeship Office as entities that obtained work permits for foreigners in 2014 (30 entities). The survey was sent to over 900 companies. However, only 44 completed and returned it, i.e. less than 5% of the group. Contacting respondents by email was found to be ineffective. The second method used in the studies was direct contact with enterprises at meetings and training courses organised for them<sup>18</sup>. Ultimately, the studies included 263 employers. The study involved managers, i.e. owners, directors, managers or people responsible for personnel policy in enterprise. In the research was used a structured questionnaire interview. The examination of the structure of answers was conducted with the use of chi-square test (Szewczyk, Ciesielska 2011).

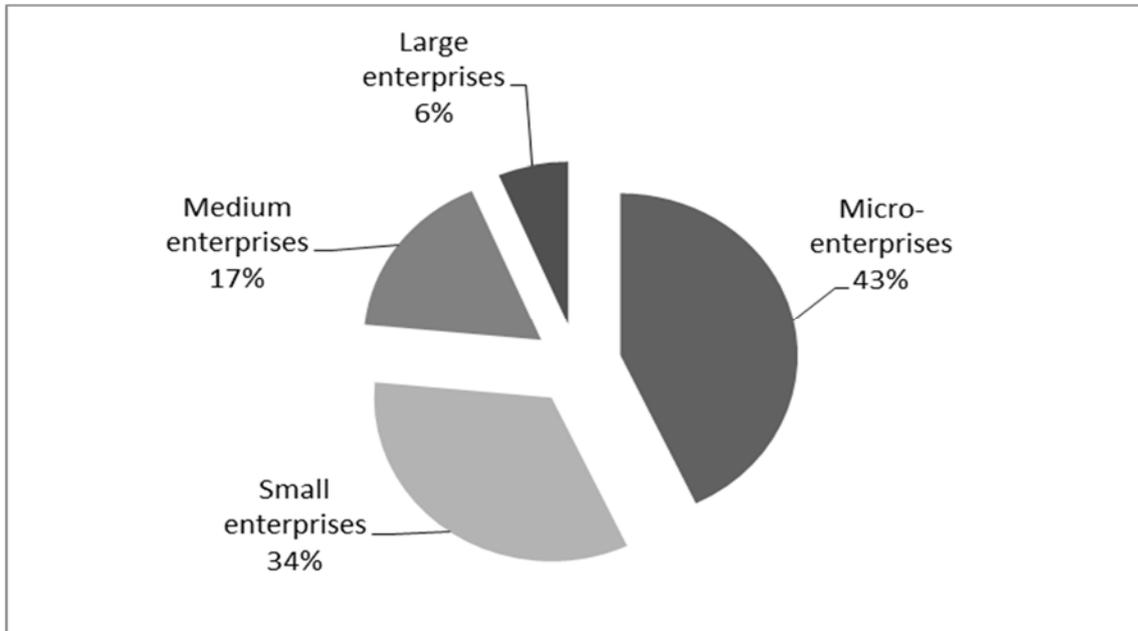
The largest group of respondents were micro-enterprises (43%, i.e. 113 entities). Over 1/3 were small companies (88 respondents). Medium and large enterprises comprised a much

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<sup>18</sup> The author of the studies was involved e.g. in business meetings organised by local government institutions and associations for enterprises.

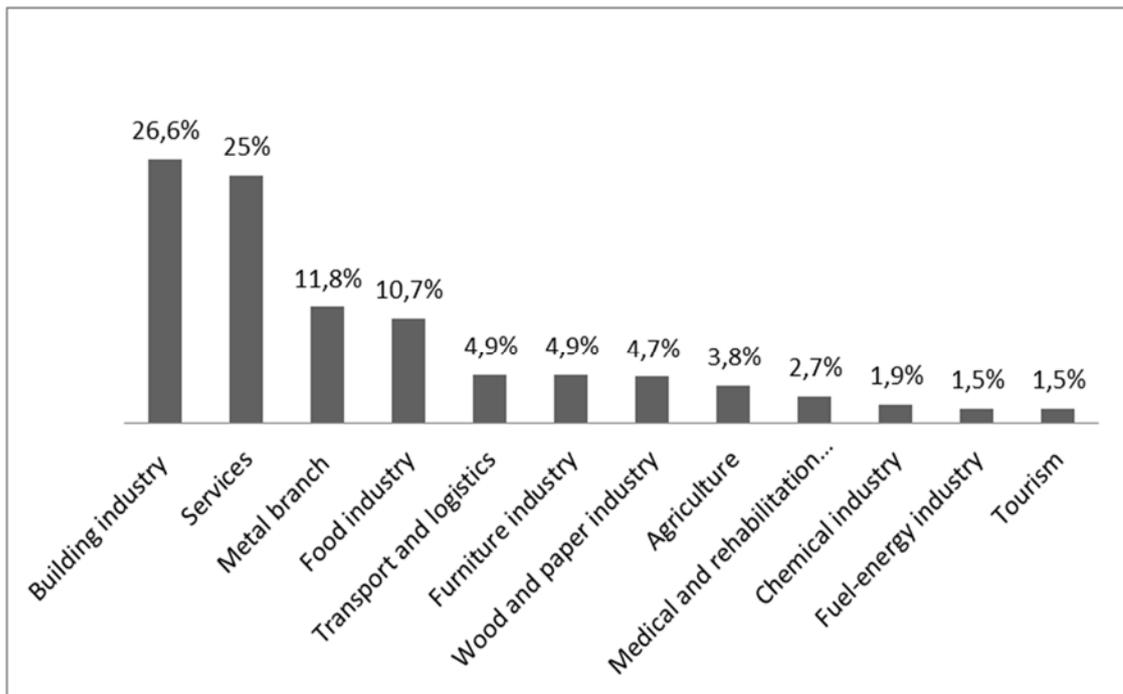
smaller part of the group: 17% (45 companies) and 6% (17 companies), respectively. It is presented in detail in Figure 1.

**Fig. 1. Enterprises by the Employment Size**



Source: Author's own elaboration on the basis of research results.

The largest number of entities in the group of companies covered with the studies were those representing building industry (over  $\frac{1}{4}$  of them, that is 70 entities). The entrepreneurs dealing in the sphere of services ranked the second – 25% (66 entities), the third place was taken by companies in the metal branch – 11.8% (31 firms), the fourth place – food industry – 10.7% (38 respondents). Details relating to the branches of individual participants are given in Figure 2.

**Fig. 2. Enterprises by sector**


Source: Author's own elaboration on the basis of research results.

The share of the examined who represented other branches was lower. Companies of furniture industry as well as those dealing in transport and logistics made 4.9% (13 entities each), the timber-paper industry – 4.7% (12 entities). In the end, as regards the number of the examined companies, the following branches can be listed: agriculture – 3.8% (10 entities), medical-rehabilitation services – 2.7% (7 entities), chemistry – 1.9% (5 entities), tourism and fuels-energy industry – 1.5% (4 respondents each).

Over 84% of the entrepreneurs in the examined group employed foreign workforce or intended to do so (223 companies), while 15.2% (40 firms) were not going to offer employment to foreigners. The juxtapositions presented in the article include answers given by the entrepreneurs who employed foreigners or were considering such a possibility.

## 2 Analysis

Over 43% of the examined indicated that the main reason for employing foreigners (or inclining to consider such a decision) was the shortage of workforce ready to take up jobs for the offered wages or ones holding skills which were required. To the employers who took the decision to

make use of foreign workers it was also relevant to take into account the greater motivation for work on the part of foreign workers (15.2% of the responses) and also their greater availability for work (13.5%). Among the significant reasons to employ foreigners there were also listed their lower expectations regarding wages (12.4%). For 10% of the respondents the reason why they decided to take advantage of foreign workforce was their higher (specialist) qualifications. The obtained responses are presented in Table 1.

**Tab. 1: Reasons for employing foreigners by the Size of Enterprises\***

Specification	Micro enterprises		Small enterprises		Medium enterprises		Large enterprises		Total	
	quantity	%	quantity	%	quantity	%	quantity	%	quantity	%
Shortage of workforce ready to take up jobs for the offered wages/ holding skills which were required	75	45,5	63	37,8	43	49,4	19	45,2	200	43,2
Higher (specialist) qualifications	15	9,1	25	15,0	7	8,0	3	7,1	50	10,9
Lower expectations regarding wages	23	13,9	20	12,0	10	11,5	4	9,5	57	12,4
Greater availability for work	21	12,7	23	13,8	13	14,9	5	11,9	62	13,5
Greater motivation for work	25	15,2	30	18,0	8	9,2	7	16,7	70	15,2
Other reason	6	3,6	6	3,6	6	6,8	4	9,5	22	4,8
Total	165	100,0	167	100,0	87	100,0	42	100,0	461	100,0

- More than one answer was possible.

$$\chi^2=23.5; df=21$$

Source: Author's own elaboration on the basis of research results.

The lack of workers was most frequently pointed to in micro-companies, medium-sized enterprises well as in large enterprises (about  $\frac{1}{4}$  of all the respondents). What is interesting, it was in small companies where the largest share of responses indicating higher qualifications of foreigners was observed as one of the factors which would be decisive in offering employment

to foreigners. In turn, foreign workers' lower expectations as regards wages were the most often pointed to by the respondents representing micro-companies. It is worth noting that among the latter, medium-sized and large companies a relatively high rate of answers indicated foreigners' stronger motivation to work as a vital factor inclining entrepreneurs to employ a foreigner worker.

The entrepreneurs who were employing a foreigner or considered such a possibility at the time of carrying out the present study were asked to list difficulties connected with using foreign workforce. In the opinion of 1/5 of the questioned representatives of enterprises (128 cases), the biggest difficulty while going through the process of formal employing of a foreign worker is posed (or can be posed) by complicated regulations (the problem is treated in a broader way in Table 2). Over 23% of the respondents (110 indications) pointed to the fact that there could be a problem finding a suitable worker who would hold skills required by the company. Nearly 17% of the entrepreneurs taking part in the survey (80 responses) claimed that the necessity to "look after" the prospective employee would pose an inconvenience regarding employment of foreign workforce, that is aiding them in finding accommodation, providing support in contacts with officials, healthcare system, etc. For over 14% (67 indications) the difficulty would arise from barriers of language and culture. Almost 13% of the examined (61 respondents) stated that in their cases the problems would lie in a lack of trust in an employee who comes "for a while" only. In the case of about 6% of the responses (29) attention was drawn to the necessity of preparing foreigners to execute their professional tasks.

**Tab. 2: Difficulties connected with using foreign workforce given by the employers by the Size of Enterprises \***

Specification	Micro enterprises		Small enterprises		Medium enterprises		Large enterprises		Total	
	quantity	%	quantity	%	quantity	%	quantity	%	quantity	%
Complicated law regulations	53	28,6	48	28,9	17	19,3	10	27,8	128	26,9
Problem with finding a suitable worker	36	19,5	43	25,9	24	27,3	7	19,4	110	23,2
The necessity to “look after” the employee	31	16,8	26	15,7	16	18,2	7	19,4	80	16,8
Language and culture barriers	27	14,6	18	10,8	16	18,2	6	16,7	67	14,1
The necessity of preparing foreigners to execute their professional tasks	14	7,6	8	4,8	5	5,7	2	5,6	29	6,1
Lack of trust in an employee who comes “for a while”	24	13,1	23	13,9	10	11,4	4	11,1	61	12,9
Total	185	100	166	100	88	100	36	100	475	100

- More than one answer was possible.

$$\chi^2=13.2; df=18$$

Source: Author’s own elaboration on the basis of research results.

In the examined group, the lowest share of responses pointing to worries connected with complicated regulations was typical of medium-sized companies. In turn, the least worried – regarding recruitment of workers from abroad – seemed to be representatives of micro-firms and large enterprises. The latter provided also the largest share of answers relating to the necessity of “taking care of” the foreign employee, that is offering help in finding accommodation and difficulties connected with it or taking on extra duties, among others. It is worth noting that barriers resulting from language and culture were most often feared by medium-sized and large companies, whereas the highest rate of responses concerning fears of the necessity of preparing foreigners to perform their professional duties was obtained in the group of micro-companies. Among the employers representing micro-companies and small

businesses there was the highest share of people drawing attention to the lack of trust in foreigners who come to take employment only for some time.

The survey was also intended to collect information concerning advantages which entrepreneurs had (or expected to have) as a result of employing foreign workforce. Over ¼ of the questioned entrepreneurs (97 indications) mentioned recruitment of workers holding required skills among the biggest benefits. For slightly over 22% of the respondents (82 indications) lowering of production costs and acquiring employees who would be ready to work longer hours were vital factors.

On the other hand, for over 17% of the examined (63 responses) it was important to secure stability of employment and continuity of production process. The examined pointed also to a competition between Polish and foreign workers, which was often going on in their companies (12.2% - 45 indications). The relevant details are presented in Table 3.

**Tab. 3: Advantages which Entrepreneurs had (or expected to have) as a Result of Employing Foreign Workforce by the Size of Enterprises\***

Specification	Micro enterprises		Small enterprises		Medium enterprises		Large enterprises		Total	
	quantity	%	quantity	%	quantity	%	quantity	%	quantity	%
Lowering of production costs	37	27,4	25	19,5	15	21,1	5	14,3	82	22,2
Stability of employment and continuity of production	19	14,1	20	15,6	15	21,1	9	25,7	63	17,1
Competition between Polish and foreign workers	16	11,9	16	12,5	10	14,1	3	8,6	45	12,2
Recruitment of workers holding required skills	32	23,7	35	27,3	18	25,4	12	34,3	97	26,3
Acquiring employees who would be ready to work longer hours	31	23,0	32	25,0	13	18,3	6	17,1	82	22,2
Total	135	100,0	128	100,0	71	100,0	35	100,0	369	100,0

- More than one answer was possible.

$$\chi^2=11.8; df=15$$

Source: Author's own elaboration on the basis of research results.

Certain differences in the distribution of responses were noticed upon taking into account the division of the surveyed respondents according to the number of the employed in the individual company. For nearly 1/3 of the micro-entrepreneurs the most important benefit resulting from employing foreigners was lowering of the production costs. This type of benefit was, in turn, the least frequently pointed to by the representatives of large enterprises, for whom (over 1/3 of the indications) the most significant point was acquiring an employee with required skills. For large entities it was also vital to maintain the stability of employment as well as continuity of production (1/4 of the responses). As regards the group of micro-companies and small firms, an important benefit resulting from employing a foreigner was to have a worker who would accept to work overtime.

### **3 Interpretation of results**

The studies made it possible to establish not only the factors which influence making decisions by the examined entrepreneurs concerning usage of foreign workforce, but also proved that there exist differences in determiners, barriers and advantages which come from employment of foreigners depending on the size of the company. This is a significant methodological establishment in the context of realization of studies of migration in enterprises, which points to the necessity of introducing a division of the examined firms according to the number of the employed workers.

**H1** was verified positively, that is it was established that the lack of native workers is the main reason why foreign workforce is more and more widely used. Still, in the case of medium-sized companies and micro-companies, the shortage of Polish workers ready to take up employment for the offered pay was of the key importance. On the other hand, for the other firms, that is small and large enterprises, the most significant reason why employment of foreign workforce was considered necessary was the shortage of workers holding required qualifications. It is difficult to unambiguously establish whether Polish workers who would be willing to take employment accepting the offered conditions were available in the market. It can therefore be accepted that entrepreneurs employed foreigners because native workers were not interested in taking employment.

Employers, irrespective of the company's size, among the difficulties connected with employment of foreign workers, listed formalities of dealing with legalization of foreign workers' employment in the first place. Thus, **H2** was confirmed. The respondents pointed also to the fear of whether a foreign worker will have suitable skills which are indispensable to

perform the work properly. It meant both professional competences and those related to language and social adjustment. This can testify to the existence of entrepreneurs' worries that there may follow difficulties connected with managing a varied group of nationals due to the employees' origins (Maj 2016). Adaptation of migrants' skills, as the research conducted, among others, in the United States, shows, is dependent on their origins and on the motive of migration.

It was established that from the point of view of the examined entrepreneurs, the most valuable advantage obtained thanks to employing a foreigner is acquisition of a worker who holds skills that are in demand. As regards the group of micro-companies, the most frequently indicated factor was lowering of the production costs. The studies did not confirm **H3** (which assumed that foreigners secure stability of employment), since it occupied the third place as far as the importance was concerned. Moreover, for employers it was also relevant to acquire a more efficient worker who would want to work overtime. It is worth noting that the last factor appears in other studies, too. Entrepreneurs from Great Britain were of a similar opinion: they listed, first of all, greater "employability" among the benefits resulting from using immigrants' work. And that was not because of a lower pay which was offered, but came in consequence of higher – as it was defined – productivity (Somerville, Sumption 2009).

## **Conclusion**

Wage earning immigration to countries of Central and Eastern Europe, including Poland, is gaining in importance. Therefore, it is vital that mechanisms which incline entrepreneurs to employ foreign workforce should be examined. It is decisions taken by the former – due to the fact that it is they who create places of work – that are of the key importance while setting up policies of the job market both on the regional and national levels. It follows from the conducted studies that wage earning immigration to Poland is of a rather substitutive character, since employers take on (or want to employ) foreigners to do jobs which could be done by Polish workers. However, it is not a kind of substitution which is to be understood in an absolutely negative way, one which would result in "pushing" Polish workers out of the job market.

For entrepreneurs, according to the findings of the study, what is more relevant is greater flexibility (employability) of foreign workforce. It results from the fact that foreigners who come to Poland on the temporary basis, solely with the aim to take up short-term paid employment, are not "burdened" with duties or commitments beside their work places (e.g., families) and are willing to work overtime. This is of paramount importance to employers who

deal in certain branches of economy, like construction industry, agriculture, transport, services (gastronomy, hotel services, taking care of elderly people). In turn, the formal-legal difficulties resulting from the legal obligations while offering employment to foreign citizens, which were mentioned by the examined entrepreneurs, point to the need for developing services connected with job placement of foreign workforce. This can be acknowledged to be a chance for the appearance of a demand for specialist services rendered to immigrants, such as translation of documents, accommodation agency, tax agency. Wage earning immigration can thus become a significant factor stimulating development of entrepreneurship.

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## THE VALUE ORIENTATION OF THE CZECH COMPANIES IN THE FRAME OF SUSTAINABLE CORPORATE RESPONSIBILITY

Dušan Kučera – Jana Müllerová

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### Abstract

**Purpose:** The authors are interested in the relations between the value orientation and performance of the Czech companies in the frame of the sustainable corporate responsibility (SCR) concept. The purpose of study is to analyse the current perception of companies and their managers/owners in the environment of transformational economies in CEE influenced by neoliberal concept of business mainly for profit. In this paper, the results of pilot research will be described.

**Design/methodology/approach:** The methodology of research was adopted from the research by Torugsa et al (2012), we extended their methodology with new questions about ethical values. We did the survey from the January till March 2017, in specific cases the interviews were done. The pilot research sample is 53 questionnaires addressed to the top management of selected companies we use of quota system; the respondents were asked randomly. Statistical analysis was conducted based on crosstabs and Chi square test. Results were interpreted in the cultural context and environment of the transformation economy - the Czech Republic.

**Findings:** The pilot research findings identify the value position of the selected Czech companies regarding SCR. The philosophy of SCR is based on the holistic responsibility of management including the economic, environmental and social area of company. The findings reveal especially the personal ethical position of management based on a developed specific value orientation. As an important accent of management is the responsibility for future generations. The research reflects also the intensity and time scope of selected measures. The questionnaire will be modified according the results to the feedback of respondents with personal clarifications.

**Research/practical implications:** Implications of research are based on the identification of value preferences which are important for practical decision making and managerial measures in specific company activities. The personal value orientation of managers has practical implication in master and executive education or consulting, because the identified value preferences are surpassing the classical economic rational and speculative frame of thinking reflecting actually the empiric situation. For this new value basis will be necessary to develop new educational approach for management development. The results of pilot research confirm the starting idea and can be enlarged for the next and significant research sample.

**Originality/value:** The research is unique in the Czech Republic because of the SCR orientation as a deep shift from CSR to SCR concept in company management. The authors used three dimensional approaches: declared values combining economic, environmental, social and future oriented sustainability concept and performance. Originality of the study is based on identification and description of philosophical assumption of managerial thinking as (in comparison with neoliberal economy) a new basis for decision process of management in companies. The pilot research offers fundamental sample set making possible to deduce the consequences for one-sided profit orientation.

**Keywords:** Values, responsibility, sustainability, decision making, consequences

**JEL Codes:** A13, D22, Q56

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## **Introduction**

There are several reasons for the research of the value orientation of Czech companies in the frame of Sustainable Corporate Responsibility. The first one relates to the historical development of the Czech economy, which lost the state control and companies after the privatization process are developing their performance approximately 25 years. After companies abandoned one long-term philosophy of business management in the spirit of socialist thinking, entered their management a new era of free enterprise in the middle of the western neoliberal capitalist environment. About general lessons from the failure of the communist economic system are published some professional texts (Rusmisch and Sachs, 2003). We further asked the management about the values of the company - what value orientation is preferred by the management in the context of global competition today?

In 1990s faced management of most Czech companies first the task to ensure ownership and basic economic survival. The beginnings of Czech capitalism (and also of other CEE countries) is marked by an emphasis on profit. Leadership of Czech economy has been in the hands of neo-liberal ideas of the father of the Czech privatization process Vaclav Klaus with his emphasis on the „market without any attributes“ and financial profit (Klaus, 1991). Profit as the main value was even anchored in the first text of Business law as "purpose of business". Till in later years, some management members discovered also the deeper task of securing more long-term development within a completely new challenge of globalization and competition within European Union and CEE countries.

Besides completion motives there are also the last serious financial and corporate crises or scandals, which helped our research among Czech managers to understand better the new approach following not only the short-term profit but the long term orientation and Sustainability of corporate responsibility. Nevertheless, while the Western companies worked with emphases on long-term values for decades, the Czech economy only started with the known concept of CSR (Corporate Social Responsibility) some years ago and are getting to know more about the new broader concept of SCR (Sustainable Corporate Responsibility) which is described by many authors (e.g. Schüz, 2012) till today.

The research approach is based on the step by step familiarizing of Czech economy with the rather new US documents like „Sarbanes Oxley Act“, founding based on the auditing done by the Czech departments of KPMG, Accenture or PricewaterhouseCoopers, which have in recent years begun to actively encourage companies to the deeper managerial accountability. The next reason for our research questions is the new Civil Code Act (No. 89/2015 Sb.) and the

new Business Corporations Act (No. 90/2012 Sb.) with stricter formulations regarding managerial responsibility and care. The last initiative in this orientation is the founding of Czech Compliance Association in Prague (2016).

The research is based also on the initiative of business school - for example the start of Business ethics courses in master programs and executive education. These courses are taking into account both economic but also social and environmental responsibility of management including its responsibility for future generations. Formal support for this development is the school membership in the international organization of the PRME-Principles of Responsible Management Education (the UN Global Compact).

## **1 Research design and methodology**

In the pilot research was developed a questionnaire based on previous research Torugsa (2012) and partly Hammann (2009). The Torugsa research is focused on CSR concept in machinery industry across Australian companies. The methodology of this research was included in our questionnaire. Hammann research focused on values in socially responsible companies in Germany. It doesn't include all the methodology, but it is one of the often-cited articles and the authors really wanted to focus on the relations between values and CSR/SCR. Our research described in this paper was inspired by the German approach and we developed our own research questions. The Czech research was done by team of researchers from The Faculty of Business Administration in University of Economics in Prague.

We are interested in the presence of company values: Whether they exist, what are their prioritised values – personality development, professional development or development of ethical responsibility? How different are priorities and goals of companies in long and short-term perspective? Does the association between priorities of the companies and the goal of the companies in short and long-term perspective exist? Priorities of the companies we understand in relation to the development and education of employees in the field of personal development (question coded as SOC10), professional development (coded SOC11) and ethical values development (coded SOC12). The goals of companies we perceive between others: achieving of financial profit (question coded STRA4A-B), increasing market share (coded ECON9A-B) and effort to solving social and environmental problems on the local level (coded ENV12A-B). The short-term goal means about one year, long term goals are more than three years. To find the answer for our research question we verified following hypothesis:

*H<sub>1</sub>*: There is association between priorities of the company and financial profit achieving in short and long-term perspective.

*H<sub>2</sub>*: There is association between priorities of the company and increasing the profit in short and long-term perspective.

*H<sub>3</sub>*: There is association between priorities of the company and the effort to solving the social, environmental problem on the local level.

As a statistical method, we used the Crosstabs analysis and Chi square test, *H<sub>0</sub>*: there is no association between variables.

### **1.1 Questionnaire design and testing**

In the part of the SCR research was used the questionnaire from published paper. The research team did very carefully the translation of questions from English to Czech language. After discussion with several respondents in the beginning was realised that some of the questions are not comprehensible, it was necessary to explain the meaning of the question to the respondents – especially questions from the field of legislation. The team decided to correct some questions in order to keep the essential meaning but at the same time to be clear and in compliance with the Czech business context.

This core part of research and questionnaire was completed with the point of interest of other team members and their field of research – sustainability, time dimension in all processes in companies according to the SCR, reporting, values. In total, all the questionnaire was about 8 pages and it took about 40 minutes to fill it. Finally, we decided to divide it into three sections – section A- the core research about SCR and sustainability in time dimension; section B includes all the partial fields of research as reporting, values of management; section C includes basic indicators of respondents.

All the questions were based on the scale of answer. The scales were changing to keep the respondents in a concentration, some scales have 4 degrees, some five and some six degrees. In part of the question has evaluated the respondent itself and to compared with competition in the sector.

The research of pilot study was done in the time frame from the January till March 2017. Finally, 53 questionnaires were collected. Randomized quota sampling was applied.

## 1.2 Respondents

The structure of the respondent was following:

- a) Legal form (N=53 subjects, 1 missing answer): Joint stock companies 14, Public trade companies 4, Limited liability companies 27, Stated owned enterprise 1, Self-employed person 6.
- b) Number of employees (N=53, 1 missing answer): Micro with 0-9 empl. 20, small with 10-50 empl. 10, medium with 50-249 empl. 5, 250- 499 empl. 3, 500 and more employees 14 respondents.
- c) Ownership (N=53, 1 missing answer): Czech private ownership 37, Czech state ownership 3, international ownership 12
- d) CZ-NACE classification (N=53, 9 missing answer): Property and developing, Transport, IT and communications (7), Culture and entertaining, Insurance and finance industry, Technical and scientific activities (4), Construction, Mining, Trade (8), Producing electricity and gas, Education, Water industry, Health and social care.

The respondents of research are managers from Czech companies. As the main indicators of respondents are used: size according to the number of employees – we use the typology from EU definition of SME's; legal form of the entity according to the Czech law system; the ownership of company; the main activity CZ-NACE. To fulfill the aim of pilot study there was not done a use of quota system, the respondents were asked randomly. There were used the personal contacts and databases of contacts from The Czech Top 100 (companies).

## 1.3 Methods

To evaluate pilot study research the basic statistical methods were used – descriptive statistic, crosstabs and Chi square test. The software SPSS was used for the calculation of research data. We used Fisher's Exact Test to calculate associations between variables.

## 2 Findings of the pilot study

It was interesting for us to analyze the concrete goals of companies in long and short time perspective. The results are shown in the Tab. 1.

**Tab. 1: The goals of the companies in the short and long term period**

Goal	Period	It is not the major goal for number of respondents	It is the highest goal for number of respondents
Financial profit	Short – about 1 year	7	22
	Long – more than 3 years	6	26
Value of company	Short – about 1 year	7	22
	Long – more than 3 years	4	26
Needs of the customers	Short – about 1 year	7	29
	Long – more than 3 years	7	31
Interest of the owner	Short – about 1 year	3	26
	Long – more than 3 years	6	28
Market share	Short – about 1 year	2	14
	Long – more than 3 years	1	18
Solving social and environmental problems on local level	Short – about 1 year	15	7
	Long – more than 3 years	13	8
Solving social and environmental problems on global level	Short – about 1 year	16	4
	Long – more than 3 years	14	5

Trends are shown even in the descriptive statistic about the goals of the companies from the short and long-term perspective according to the fields of responsibility – see Tab. 1, only the counts for the lowest and highest priorities are included from N=53. Traditional business goals have minimal differences between long and short term. Very interesting is the approach to the typical aspect of responsibility and sustainability – solving social and environmental problems – this has very low priority by the higher number of respondents.

In the questioned companies, the most used form of education of employees are training courses, mentoring, coaching and e-learning are not very common. 40 respondents very strongly or strongly agree with the idea that the values of the company are well known to all of employees, about the goals of the company it is only 34 respondents. (N=53) The highest priorities in education of the employees has the professional development – strongly agree and agree 33 respondents, ethical and personal development have the highest priorities in case of 26 and 25 respondents.

The SPSS software for testing hypothesis was used. Trying to count any association between two variables was not possible at the first moment because of very low number of causes for each observation. The scales for answer had six degrees, which is too large for 53 respondents. We had to simplify it and to combine two degrees into one. After these changes still the number of causes was less than 5 in some cases. We decided to count Fisher Exact test, which increased the reliability of the test.

**Tab. 2: The priorities and the goal effort to solving social and environmental problems in long term period: Chi-Square Test and Fisher’s Exact Test results**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	14,593 <sup>a</sup>	4	,006	,005	
Likelihood Ratio	17,751	4	,001	,002	
Fisher’s Exact Test	14,756			,003	
Linear-by-Linear Association	8,673 <sup>b</sup>	1	,003	,003	,002
N of Valid Cases	47				

a. 4 cells (44,4%) have expected count less than 5. The minimum expected count is 1,87.

b. The standardized statistic is 2,945.

**Tab. 3: The priorities and the goal effort to solving social and environmental problems in short term period: Chi-Square Test and Fisher’s Exact Test results**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	9,928 <sup>a</sup>	4	,042	,040	
Likelihood Ratio	12,399	4	,015	,023	
Fisher’s Exact Test	9,861			,030	
Linear-by-Linear Association	5,228 <sup>b</sup>	1	,022	,026	,013
N of Valid Cases	47				

a. 6 cells (66,7%) have expected count less than 5. The minimum expected count is 1,53.

b. The standardized statistic is 2,286.

After this we can say that only the H<sub>3</sub> was confirmed – there is association between priorities in ethical values development and education of employees in the company and the goal of company effort to solve the social and environmental problems on local level, especially

in long term perspective – in this case the P value is 0,003, which shows the strong association, see Tab. 2 and Tab. 3.

## **Conclusion**

First, the pilot study shows us limitation of our questionnaire. It was difficult for respondents to answer to all questions. The result of questionnaires are showing that the answer „I don't know“ or „I don't care“ is missing and it would be helpful to minimize this missing answer. Also, there is big problem with six degrees of the scale, it would be necessary to combine in into three degrees. Generally, even the pilot study without deeper statistical analysis shows specific results which could confirm our hypothesis.

Our pilot study confirmed that association between values (priorities) and goals of the companies exists. After achieving full dataset, we hope we will be able to prove stronger association in between more goals of companies.

Actually is evident that even after 25 years of privatisation is still very important the neoliberal economic philosophy - financial profit, value of company, interest of owners and market share. The managers know that important is to meet the needs of the customers, but the solving of next social and environmental problems on local or global level (holistic approach) is not in the focus of business strategy.

Even the pilot research is alarming the current entrepreneurial philosophy, that the meaning of entrepreneurship is not only to earn the money but to „solve the human problems“ (Kraigher-Krainer, 2014) in the context of social and environmental challenges or needs of future generations. It seems that the Czech management is still busy with everyday pragmatic tasks of the company. The wider context of business doesn't interest him. It is also clear that the fresh emphasis of business schools on the SCR is among the managers not yet present. The responding managers also belong mostly to the older generation than are the recent management schools' graduates. For schools means this information even stronger challenge and calling to teach Business Ethics not only for the master programs but also in the practical executive education. MBA programs and for broader public awareness about SCR for the company, employees, society, environment and future should be the next step.

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## CORPORATE SUSTAINABILITY REPORTING

Vilém Kunz – Štěpánka Hronová

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### Abstract

**Purpose:** Close monitoring of sustainable corporate behavior by companies' existing or potential customers and other stakeholders represents a current trend. Therefore, sustainability reporting is gaining on its importance. Topicality of the issue brings the authors to the objectives of fostering the depths of knowledge and building awareness of corporate sustainability and its reporting in the Czech Republic.

**Design/methodology/approach:** The paper analyses primary data about sustainability reporting and reveals results of a pilot sample-based survey conducted via self-administered electronic questionnaires completed and returned by 46 respondents (micro businesses, SMEs, large businesses in CR) as a requisite initial step to a larger scale research within the project called *Sustainable Corporate Responsibility - IP 304026*. For the given variables, graphical representations are worked out and calculations of medians, averages and modus figures are provided as well as the Chi-square statistic. Finally, as a method for data analysis of the 2017 collection and the 2016 figures of similarly sized samples, comparative analysis is used.

**Findings:** The paper brings and examines findings on the following areas: the extent to which a company reveals information on its CSR activities to its external and internal stakeholders; forms of sustainability reporting (within annual general reports, online press releases, or ad hoc CSR/ sustainability reports); membership in non-governmental organizations' (NGOs) networks and platforms, and/or close collaboration with non-profit organizations focused on CSR/ sustainability.

**Research/practical implications:** Newly, based on the mandatory EU directive, social and environmental activities of companies will have to be reported by companies with over 500 employees starting 2017. As a result of this research more companies not legally obliged to report might start to do so in order to improve their public image as well as to boost the competitive edge of their business entity. Many respondents from micro or small businesses actually got acquainted with the concept thanks to the research. The authors further suggest to research the field of particular reporting standards used. Internationalizing the research may also be possible.

**Originality/value:** This pilot research contributes to the visibility of transparent corporate communication focusing on the information about ecological and social repercussions caused by economic activities of a company as well as releases about the impacts' prevention and community support. The paper brings news about the reporting duty and up-to-date standards.

**Keywords:** Sustainability, corporate social responsibility, non-financial reporting, corporate communication, NGOs

**JEL Codes:** M14, Q56

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## **Introduction**

The introduced paper focuses on sustainability reporting which can be described precisely by using the Global Reporting Initiative's definition. Having set the globally recognized and utilized standards of reporting, this institution defines a sustainability report as follows: “*a report published by a company or organization about the economic, environmental and social impacts caused by its everyday activities. A sustainability report also presents the organization's values and governance model, and demonstrates the link between its strategy and its commitment to a sustainable global economy.*” (GRI, 2017)

The implementation of sustainability principles brings the necessity to incorporate them into the corporate values, business strategies and processes at all levels of the company. Comprehensive communication about socially responsible activities with all corporate stakeholders creates a prerequisite for effective implementation of CSR into corporate practice.

Large companies in the Czech Republic will have a duty to compile a CSR/ sustainability report and thus transparently inform all stakeholders starting 2017; reporting activity of smaller entities lies within their own voluntariness. This optional action, contributing broadly and positively to society and involving business strategies and practices adopted by firms, goes beyond regulatory requirements. In literature, it is also called *proactive CSR*. (Torugsa et al, 2012)

This paper draws attention to types of communication about CSR business activities and sustainability reporting which were voluntary for all companies regardless their size at the time of this paper compilation. The research attempts to figure out the form and extent of sustainability reporting and CSR communication towards external and internal stakeholders. It also checks forms of sustainability reporting (annual reports, online press releases, or ad hoc CSR/ sustainability reports) and monitors membership in non-governmental organizations' (NGOs) networks and platforms, and/or close collaboration with non-profit organizations focused on CSR/ sustainability. Finally, the paper offers comparative analyses of two sets of data based on 2016 and 2017 researches into the sustainable reporting issue of companies operating on the territory of the Czech Republic.

## **1 Concept of responsible corporate behavior and its communication**

The concept of responsible corporate behavior often called *Corporate social responsibility (CSR)* has been spontaneously developing since the 50s of the 20<sup>th</sup> century and its application has widened over the decades having been influenced by many factors: increasing number of

MNCs, globalization or growing pressure on socially responsible behavior by stakeholders – to mention just a few. Such width of the concept that is frequently being described as a model based on three pillars called *triple bottom line* (Segal-Horn & Faulkner, 2010) as well as the constant unrestrained development have led to multiplicity of definitions. Nevertheless, some authors are able to point out common traits within numerous definitions. For example, Dahlsrud (2008) revealed basic components which appeared most frequently in the CSR definitions: environmental, social and economic areas, and areas of stakeholders and volunteers. He claims that although the existing CSR definitions are different in terms of the lexis used, they are actually harmonized or congruent as his analyses showed that four out of the five above mentioned areas can be found in 80 percent of the definitions. ISO 26000 standard, for example, defines CSR as "*...the responsibility of an organization for the impacts of its decisions and activities on society and the environment*" (ISO 26000) and another often-cited definition sees CSR as "*...the responsibility of enterprises for their impacts on society*". (COM, 2011).

Sustainable behavior of companies communicated towards all stakeholders (customers, business partners, investors, employees, local community, consumer organizations or the general public) might significantly boost the credibility of the business. It can also increase their reputation and as good workplaces thus improving their attractiveness. (Catano & Morrow Hines, 2016) It is appropriate to spread information about sustainable activities towards external and internal public using various media: corporate websites, annual reports, brochures, leaflets, newsletters or newspapers, corporate information board, intranet, corporate events' promotion. A comprehensive document informing stakeholders about achievements on the field of CSR is called Sustainability or CSR Report. Such a report is often based on or made in accordance with the international reporting standards. (Kašparová & Kunz, 2013) However, a number of reasons still exists why companies do not devote to CSR reporting. These are, for example, expectations of increased costs, insufficient knowledge of the issue or its ignorance. (Van Wensen et al, 2011)

## **2 Current trends in reporting**

Recently, the volume of CSR/sustainability reporting has been on a rise from different reasons. One of them is that shareholders put pressure on companies to disclose data related to sustainability risks. Some other factors influencing whether or not the reports are compiled and published are: industry, size of the company, its international involvement, public pressure, cultural influences or endeavor to show its uniqueness. (Douglas et al, 2004)

The latest trends in the area of CSR reporting are characterized by the following traits: rising verification by an independent third party (auditor); financial evaluation of CSR benefits; sustainability reports future-oriented; CSR reporting spreading across the supply chain; *integrated reporting* being created and the internet potential being utilized. (Pavlík & Bělčík, 2010) Sustainability/ CSR reports serve as a tool for communication but they also perform the role of a management tool providing a company with a systematic approach to CSR.

## **2.1 Standards of reporting**

Companies which voluntarily decide to compile a CSR/ sustainability report or those having an obligation to do so shall focus on the most appropriate form of processing the CSR/ Sustainability report and its communication. An effective tool for reporting – the Global Reporting Initiative (GRI) methodology – can be used as one of the options. The most significant standards complementing the above mentioned standards are: the ISO norms 26000 and the 14000 series, SA8000, EMAS, AA1000, UN Global Compact or OECD guidelines.

## **2.2 Global Reporting Initiative Standards' Development**

Global Reporting Initiative is an international independent organization which since 1990s has been helping companies to comprehend and communicate the possible impact of the corporate activity on sustainability issues. Today, based on the GRI website, 92 percent of the 250 largest corporations in the world report on their sustainability performance. GRI provides standards for non-financial reporting which are the most widely used. They enable companies, citizens, governments and institutions to make better decisions based on the disclosed information. GRI provides support to organizations via their website where *GRI Support Suite* offers tools and services which enable report preparers to compile the report more smoothly and precisely. Currently, the version *G4* is available which replaced the previous version *G3* (used from 2008). *G4* takes into account interests of reports' users to a greater extent. It has two levels (*Core* and *Comprehensive*) with the latter showing more specific indicators for strategy and analysis management, ethics and integrity. For both of the above *G4* options, there are special additions to various industries. Nevertheless, the newest set of standards downloadable on the GRI website (since October 19, 2016) called *GRI Standards* already exists. This will be the only acceptable version after June 30, 2018. This latest module contains three universal Standards used to prepare a sustainability report. Organizations also choose from topic-specific standards in order to report on its material topic (Environmental, Economic, and Social Standards).

### 2.3 Obligatory sustainability reporting

In 2017, historically for the first time, European companies with over 500 employees will have to fulfill an obligation to create a separate CSR report. The duty is based on the mandatory directive 2014/95/EU on non-financial reporting approved by the European Parliament in 2014. It is estimated that this legislative action establishing a general flexible framework for non-financial reporting is going to affect approximately 6,000 EU's companies.

The further described research reveals data on the most recent situation in the field of sustainability reporting in the Czech Republic. It is important to take into account the fact that 2016 sustainability reporting was still voluntary including companies with 500+ employees.

## 3 Research

The paper reveals figures from the pilot part of the currently ongoing complex research into sustainable behavior of companies in the Czech Republic where the data is still being collected and the overall analysis will have been finished by the end of 2017. To evaluate the pilot for this paper, 46 questionnaires collected by the deadline of the paper were taken as a sample. The chart below shows distribution of legal forms of business among the respondents.

**Tab. 1: Respondents' Form of Business**

Self employed	Ltd.	Joint stock	Public company	Limited partnership	European Company	State enterprise	Other
6	29	8	2	0	0	1	0

Source: Authors

As far as the core business of the companies is concerned, the modus was calculated showing figure 19 representing option *other* followed by these most frequently checked fields: *information and communication activities, processing and manufacturing, and wholesale and retail*. In order to collect data for the further described part of the research, an electronic questionnaire was compiled in Czech as a tool for data gathering. The section of the questionnaire focusing on CSR reporting and membership of companies in NGOs is shown below (translated into English for this article).

**Fig. 1: Questionnaire – Sustainable Corporate Responsibility. Reporting.**



Questionnaire - Sustainable Corporate Responsibility - IP 304026



**Does your company inform about its CSR activities?**  
(from 1 = "no focus on this issue" to 5 = "high importance/company has a leading role")

External public (external stakeholders)	1 - <input type="checkbox"/>	2 - <input type="checkbox"/>	3 - <input type="checkbox"/>	4 - <input type="checkbox"/>	5 - <input type="checkbox"/>
Internal public (internal stakeholders)	1 - <input type="checkbox"/>	2 - <input type="checkbox"/>	3 - <input type="checkbox"/>	4 - <input type="checkbox"/>	5 - <input type="checkbox"/>

**What is the extent of your CSR reporting?**  
(from 1 = "no focus on this issue" 5 = "high importance/company has a leading role")

Information about CSR activities published in Annual Reports.	1 - <input type="checkbox"/>	2 - <input type="checkbox"/>	3 - <input type="checkbox"/>	4 - <input type="checkbox"/>	5 - <input type="checkbox"/>
Information about CSR activities published on the corporate website.	1 - <input type="checkbox"/>	2 - <input type="checkbox"/>	3 - <input type="checkbox"/>	4 - <input type="checkbox"/>	5 - <input type="checkbox"/>
Information about CSR activities published in separate CSR reports.	1 - <input type="checkbox"/>	2 - <input type="checkbox"/>	3 - <input type="checkbox"/>	4 - <input type="checkbox"/>	5 - <input type="checkbox"/>

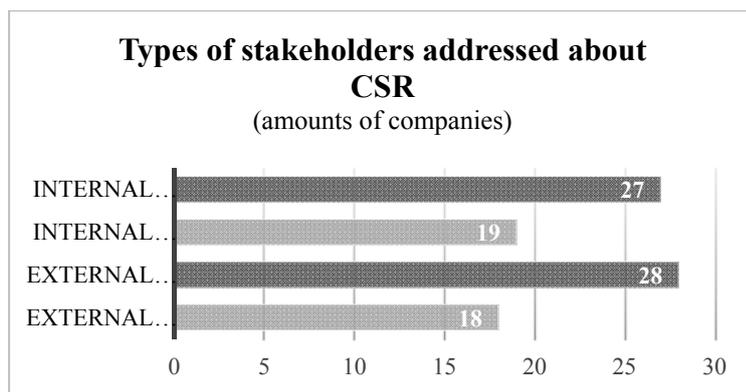
<p><b>Is your company a member of an NGO focusing on CSR/ sustainability issues?</b></p> <p>No <input type="checkbox"/> Yes <input type="checkbox"/></p>	<p><b>How long?</b> (round up to whole years)</p> <div style="border: 1px solid gray; width: 40px; height: 20px; margin: 0 auto;"></div>	<p><b>How important is the membership for your company?</b> (from 1= "no importance" to 5= "major importance")</p> <p>1 - <input type="checkbox"/> 2 - <input type="checkbox"/> 3 - <input type="checkbox"/> 4 - <input type="checkbox"/> 5 - <input type="checkbox"/></p>
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Source: Authors

### 3.1 CSR publicity towards internal and external stakeholders

The described section of the complex research firstly focuses on the type of stakeholders who are being addressed by the corporate communication in terms of CSR information dissemination. The below graph shows the research findings on amounts of companies which do or do not inform their stakeholders about CSR. It was revealed that on average 60 percent of companies inform either their internal or external public about their CSR activities to a certain extent.

**Fig. 2: Types of stakeholders addressed (internal/ external)**



Source: Authors

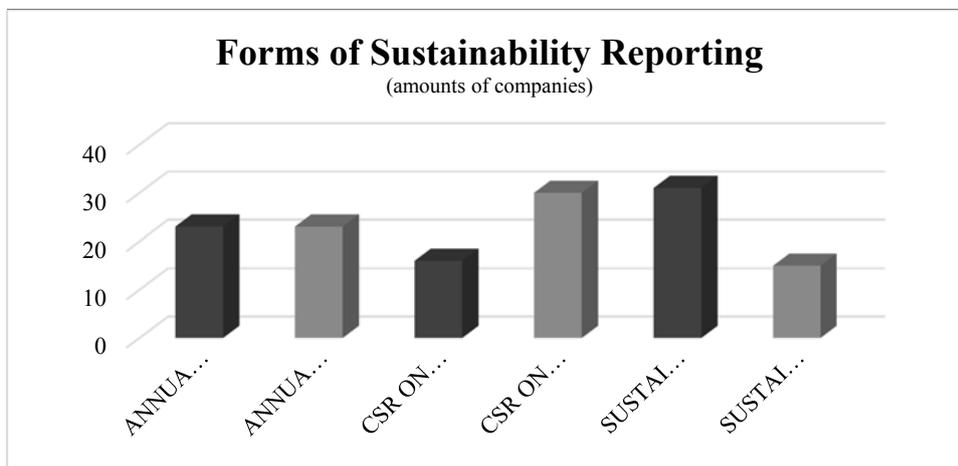
The scale 1-5 was then used to express the level of involvement. The research showed that in the firms which communicate about their responsible acts towards the society and the environment, the median for the level of involvement towards the external public was 3 and it

stood at 4 for the internal stakeholders. Companies active in the field thus perceive their process of sending data towards their internal stakeholders as more intense.

### 3.2 Form and extent of CSR/sustainability reporting

Secondly, looking at the form and depth of sustainability/ CSR reporting of companies in the Czech Republic, the prevailing part – 30 companies (65%) – claimed that they inform via *corporate websites*. 23 institutions spread CSR information using the *annual report*; the lowest represented option is a separate *CSR/ sustainability report* with 15 entities using this particular form. On average, in all three categories, about 50 percent stated that they do not provide some of the proposed types of non-financial reporting. The data is visualized on the below Figure 3.

**Fig. 3: Forms of CSR/sustainability reporting**



Source: Authors

The extent to which companies report and how strong they feel compared to their competitors, is shown on the averages calculated for the individual types of reporting: *annual report* 3.5, *website* 3.2 and *sustainability report* 3.4 on a five-point scale. The reporting companies feel most involved in incorporating the CSR section into their *annual reports*.

### 3.3 Relation between type of reporting and a company size

Thirdly, the authors examined whether the following two kinds of variables are dependent: type of reporting and a company size. The Chi-square test was run for the three types of CSR/ sustainability reporting and different sizes of organizations in terms of human resources' amounts. The calculated chi-square statistic is 4.0704, the figures for pairs of variables can be seen below in the chart (Fig. 4), the *p*-value is 0.667; at  $p < 0.05$  the result is not significant which shows the type of reporting and size of company as independent variables.

**Fig. 4: Chi-square for the type of reporting and company size as variables**

	0-9	10-49	50-249	500+	Row Totals
ANNUAL R.	4 (4.74) [0.11]	4 (4.40) [0.04]	5 (4.40) [0.08]	10 (9.47) [0.03]	23
WEB	9 (6.18) [1.29]	6 (5.74) [0.01]	5 (5.74) [0.09]	10 (12.35) [0.45]	30
CSR REP.	1 (3.09) [1.41]	3 (2.87) [0.01]	3 (2.87) [0.01]	8 (6.18) [0.54]	15
<b>Column Totals</b>	14	13	13	28	<b>68 (Grand Total)</b>

Source: Authors

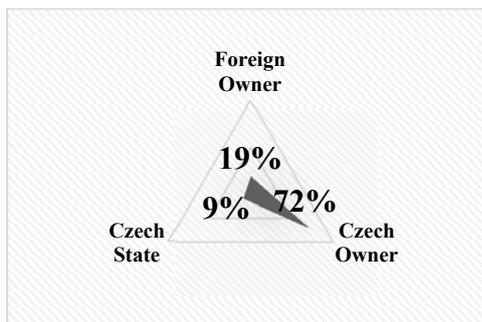
### 3.4 Membership in NGOs focusing on CSR/ sustainability

Finally, membership of corporate bodies among NGOs focused on CSR was examined with the result of 17 percent of the sample being a member of such institutions. On average, these firms have spent approximately 10 years as members of these organizations.

## 4 2017 research compared to 2016 data

During the previous research in 2016, 50 companies were examined in terms of their non-financial reporting posted. While the last year’s research contained prevailing amount of companies owned by foreign owners (60 percent), this year’s pilot of 46 companies (which makes a sample comparable in size) included almost three quarters of companies with Czech ownership. Figure 4 depicts the ownership structure of the 2017 sample showing the remaining 19 percent of firms under foreign ownership and 9 percent of Czech State companies.

**Fig 4. Ownership structure of the sample in 2017**



Source: authors

The 2016 research revealed that 70 percent of the respondents had a section devoted to responsible behavior on their corporate sites. The 2017 data shows 65 percent of firms (mostly in hands of Czech owners) informing about CSR through their corporate websites. The 2016

research examined CSR reporting among the sample of 50 best companies from the 2014 *Czech Top 100* with prevalingly foreign owners and larger-sized companies. Table 2 below brings the comparison of CSR reporting on corporate websites.

**Tab. 2: CSR section on websites**

	TOTAL	CSR/sustain. on the web	In %
All companies 2016	50	35	70
All companies 2017	46	30	65

Source: Authors

The newly examined 2017 sample contains a mix of companies but mainly of micro and small size under Czech private ownership, which might have caused the decrease in reporting figures of CSR on the corporate websites shown in Table 2 compared to 2016. The difference of 5 percent points in favor of the 2016 sample could have been also due to the fact that larger companies under foreign ownership and MNCs often take over their home CSR practices from abroad where the trend is more widespread.

## Conclusion

To a large extent, responsible activities can contribute to an enhanced image of a company on domestic as well as international markets. Adoption of fundamental CSR principles and transparent communication are gaining more attention by business entities in the CR also in connection with the mandatory directive *2014/95/EU* and the possibility to use the new *GRI Standards*. There are multiple ways for companies to inform about their responsible activities.

The research revealed that *websites* are the most frequently used tool (65%) followed by *annual reports* and *sustainability reports* within the particular sample; it also showed that 17 percent of the sample claimed to be members of NGOs focusing on sustainability issues. However, the reporting companies feel more involvement in incorporating the CSR section into their *annual reports* which could have been caused by a relative novelty of the activity compared to the already more routine uploading CSR information onto a corporate website. The Chi-square test run for the type of reporting and size of company indicated these two as independent variables for this particular sample.

The pilot probe proved the questionnaire well-built and possible to use for the project. Nevertheless, it was discovered that larger attention shall be paid to the completeness of the returned questionnaires as some of them arrived incomplete, not valid for further data analysis

and had to be returned for the completion. An interviewer-administered questionnaire or an assistance during the filling-in process could provide a solution to this problem; however, it is not always possible because the data for the eight-page questionnaire is frequently put together throughout the firm by people of different positions and departments.

As for the implications of findings, which revealed lower reporting rate compared to the last year mostly foreign-owned sample, the authors feel that more shall be done in terms of spreading the word about the CSR/ sustainability concept among Czech SMEs.

The objective of building awareness about corporate sustainability and its reporting in the Czech Republic was achieved because many respondents from micro or small businesses got acquainted with the concept and GRI standards thanks to this research. This could help the business practice as well as all stakeholders who may later feel a positive impact of a company adopting principles of sustainability (having been inspired by the research) in near future. The authors further suggest investigating the field of particular reporting standards used or probe reporting by GRI G4 or the GRI Standards in the Czech Republic. Internationalizing the research is also highly recommended by the authors.

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## CAUSAL ALTERNATE PATHWAYS FOR HIGH PERFORMANCE. A STUDY OF UNIVERSITY SPIN-OFFS FROM POLAND

Anna Kwiotkowska

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### Abstract

**Purpose:** The purpose of this paper is to explore causal alternate pathways for high performance among university spin-offs from Poland.

**Design/methodology/approach:** The traditional configuration approach suggests using the strategy, structure, and environment domains to identify configurations. In response to calls to improve causal linkages, and drawing on work on start-ups' configurations, entrepreneurial orientation is used with these domains to identify configurations. Fuzzy-set qualitative comparative analysis (fsQCA) is used to analyze data collected via questionnaires from 53 university spin-offs from Poland.

**Findings:** The study of the configuration of attributes was done using Boolean algebra - a notation system enabling the algebraic processing of logic statements. This allowed the assessment and selection of five alternative combinations of elements making up the organizational configurations of spin-off companies, leading to the high performance of the companies studied in Polish conditions. In all five identified configurations, firms adopt high external integration, and employ development strategies, exhibit high internal integration, or do not operate in a highly competitive industry. These firms carve out niches, and enjoy strong linkages with supply chain partners.

**Research/practical implications:** The degree of development of academic entrepreneurship, as seen from the perspective of spin-off companies, is negligible in Poland. What is more, the understanding of so complex phenomenon that spin-off companies are, remains limited and, as such, requires in-depth research. It seems interesting to determine the type represented by Polish spin-off companies, the factors determining the success of these companies. The response to such questions will be provided by taking a holistic look at the problem under study from the configurational perspective and making an attempt to define the causal alternate pathways for high performance among these firms.

**Originality/value:** The performed research contributes to the understanding of the core of functioning and growth of spin-off companies in Poland. The paper highlights differences across configurations, and that founders devise alternate pathways to achieve high performance. It also notes changes in relationships among variables across configurations.

**Keywords:** university spin-off companies, academic entrepreneurship, configuration theory, fuzzy set Qualitative Comparative Analysis, firm performance

**JEL Codes:** D22, L25, L26.

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## **Introduction**

Research related to university spin-offs (USOs) is attracting increasing attention, as they are now acknowledged as an important source of innovation that provides an impetus to local economies in terms of new jobs creation and other economic benefits. However, the role of USOs in the economic development of Poland is the subject of much controversy among researchers and policy-makers. It should be noted that enterprises referred to as USOs came to being in the Polish economy along with economic transformations in the early 90s. The exact estimation of the size of the USOs sector in Poland is difficult due to the lack of reliable statistic data. It is estimated, however, that there may be at least several dozen of them. In terms of their economic characteristic, these firms do not deviate from the European spin-off standard. Usually, these are small-size firms employing fewer than 10 workers and often using outsourcing. The incomes of spin-off firms are running on average at a level from 250 to 500 thousand EUR per year. The founders of these firms are chiefly people with higher technical education, often having also an academic degree and deriving from the academia. Links with academic centres constitute an important source of innovation and information to them. Many of them have retained their university positions and are participating in academic research. These enterprises fill the gap in the advanced technology production and services. They also provide consultancy services at a high level comparable to that of similar centres abroad. However, many researchers claim that it is essential to recognize the heterogeneity and the context of USOs, because not all USOs are able, or required, to achieve high growth-based performance while high-growth USOs do play a particularly important role in university technology transfer and economic return. This makes USOs an intriguing phenomenon to study. As firms' performance depends on many firm-level and external factors, and their mutual interaction, a configuration approach is best suited to study multiple causal alternate pathways (configurations of determinants) that lead to firms' high performance (Harms, Kraus, Schwarz, 2009).

Meyer, Tsui and Hinings (1993) have broadly defined configurations as “any multidimensional constellation of conceptually distinct characteristics that commonly occur together.” Taking a holistic view, the configuration approach regards a firm as a complex entity and attributes variation in the dependent variable, firm performance, to fit among multiple domains of predictors, namely, strategy, structure, and environment (Harms Kraus, Schwarz, 2009; Short, Payne, Ketchen, 2008). Importantly, aside from offering a more holistic perspective to the understanding of organizational activities, configurational approaches

facilitate insights into the equifinality of different configurations (Fiss, 2007). What is more, configurations are an important means of capturing the complexity of an organization and understanding the relationship between the organizations and their performance outcomes. However, recent discussion on the configuration literature points to inadequacies in the theoretical specification of configuration models, and highlights a lack of causal explanations among predictor domains (Van de Ven, Ganco, Hinings, 2013). The entrepreneurial orientation literature, which suggests that entrepreneurial orientation is a key decision-making proclivity vital to young firms, is used to fill this gap in the present paper.

It seems interesting to determine the type represented by Polish spin-off companies, the factors determining the success of these companies. Accordingly, the research question is: What configurations can be identified among Polish USOs? The response to such question will be provided by taking a holistic look at the problem under study from the configurational perspective and making an attempt to define the causal alternate pathways for high performance among these firms. Furthermore to answer these question, fuzzy-set qualitative comparative analysis (fsQCA) was employed on primary data collected from 53 USOs. Analysis reveals five alternative combinations of elements making up the organizational configurations of spin-off companies. Causal alternate pathways enabling high performance through these configurations, and their implications are discussed in this paper.

## **1 Theoretical background**

Configuration scholars argue that a better understanding of firms' performance can be achieved by identifying internally consistent sets of coexisting variables collectively termed as configurations, rather than looking for universal or contingent relationships among two or three variables (Short, Payne, Ketchen, 2008). Among others Fiss (2007), Greckhamer, Misangyi, Elms, Rodney (2008) have highlighted using configuration approach for strategy research is made an attractive choice by the possibility of revealing insights about multiple conjunctural causation<sup>19</sup>, causal asymmetry<sup>20</sup> and equifinality<sup>21</sup>.

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<sup>19</sup> Conjunctural causation - many causes/variables combine to produce several causal alternate pathways, each of which could lead to the outcome (Ragin, 2008).

<sup>20</sup> Causal asymmetry - the idea that the causes leading to the presence of an outcome of interest may be quite different from those leading to the absence of the outcome (Ragin, 2008).

<sup>21</sup> The concept of equifinality refers to a situation where a system can reach the same final state, from different initial conditions and by a variety of different paths. Equifinality assumes that two or more organizational configurations can be equally effective in achieving high performance, even if they are faced with the same contingencies (Fiss, 2007).

Empirical research on medium and large firms mainly focussed on factors related to various environmental and organizational elements, especially environment, strategy, and structure as a imperatives to create configurations and termed each group of factors as domain (Short, Payne, Ketchen, 2008). Fiss (2011), and Harms, Kraus, Reschke (2007), highlighted that past configuration research on well-established firms has mostly used these group of factors, and has neglected the use of indicators of managerial philosophy about decision making along with these three domains. Frank, Lueger, Korunka (2007) highlighted that personality factors are most important for start-ups' configurations. Personality factors and the cognitive processes of entrepreneurs, with their antecedents in prior social or professional exposure, guide how entrepreneurs make assumptions, and gather and process information to make decisions for achieving coherence among internal elements – structure, processes, and capabilities – and fit with external factors during the start-up phase. Accordingly, to respond to calls for using indicators of managerial philosophy for identifying young firms' configurations, entrepreneurial orientation is used as a constituent for configurations (Frank Lueger, Korunka, 2007; Rigtering, Kraus, Jensen, Eggers, 2014).

Researchers adopting a configuration approach face increasing constraints in establishing the specificity of the theoretical relations as the number of multidimensional constructs under consideration rises (Venkatraman, 1989). Accordingly, a number of scholarly articles that have similar research purposes (employing a large number of determinants simultaneously using a configuration approach), and are published in reputable management journals, contain no propositions (or hypotheses) about the nature of the configurations (e.g. Fiss, 2011; Greckhamer, Misangyi, Elms, Rodney, 2008).

## **2 Study design: methods, sample, variables description**

An important issue raised in the aspect of the configurational approach to organizations is the mismatch between the theoretical discussions on the theory of configuration underlining non-linearity, synergic effects and equifinality, and the empirical studies using econometric methods that intrinsically imply no linearity or equifinality – the existence of a single optimal configuration. Regression analysis, interaction effects, or factor creation algorithms can be mentioned here. However, as Fiss (2007, p. 1189) claims, there exists a methodology for studying the complex causality in the form of set theoretic configurational methods. These methods rely on the view that different conditions form combinations rather than compete with one another in achieving a particular outcome, and that different combinations of conditions

may exist, which will lead to the same outcome. Thus, set theoretic configurational methods, especially fuzzy set Qualitative Comparative Analysis (fsQCA) lend themselves well to the study of configurations and equifinality.

FsQCA, as propounded by Charles Ragin, is a comparative case-oriented research technique that uses the concepts of Boolean algebra for the analysis of social science statements in terms of set relations. The interpretation of the fsQCA as a research approach relates to the specification of the model, selection of cases, the interactive process of collecting data, and the re-conceptualization of the conditions and outcomes. In fsQCA the basic unit of analysis is set (defined as the certain condition or outcome of interest). After defining the set, researchers code cases for whether they have membership in the set of causal conditions and outcome. This information is then summarized as a truth table using fsQCA software and logical algorithms are used to reduce the configurations found in the truth table to a few causal alternate pathways (specifying which causes must be combined) to produce the outcome (Ragin, 2008). The intentional, non-random choice of cases was guided theoretically, while the use of the multiple case study enabled several cases to be studied simultaneously within a single research undertaking. Each individual case was examined as a complex combination of characteristic features making up "wholes" forming specific configurations. What more, fsQCA allows researchers to check the relative importance of a causal alternate pathways and overall solution by measuring "coverage," that is, the relative importance of different paths to an outcome, and "consistency," that is, what proportion of observed cases are consistent with the pattern (Fiss, 2011; Ragin, 2008).

A consequence of the selected research method was the non-random, intentional choice of a sample from USOs in Poland. The selection of enterprises was guided by the following criteria: the selected enterprises are relatively new, developing business ventures relying on the transfer of knowledge (as seen from the aspect of the transfer of intellectual assets, and not only technologies), set up by young persons being final-project students, doctoral students, or academics. The research was conducted in the form of interviews with the founders or management representatives of 53 firms, in the period from March to June 2015. In the research, the triangulation procedure was utilized. Information collected from the surveys and from other sources (e.g. the internal documentation of the enterprises, archival data, websites) was used for carrying out an analytical procedure using fuzzy set Qualitative Comparative Analysis (QCA).

Following the traditions of QCA, the outcome is defined as the set of high-performing organizations. Firms' performance is a multidimensional construct requiring multiple measures

to capture these dimensions (e.g. Wiklund, Shepherd, 2005). For this study, the performance of firms was assessed using the scales for measuring firms' performance adapted from Antonic, Hisrich (2003) and Chandler, Hanks (1993). These measures are reported in table 1.

**Tab. 1: Items used to operationalize outcome and conditions**

Dimension	Items (measured using seven-point Likert scale)
Outcome (dependent variable)	
Performance	Performance (as compared to next best competitor) in the past three years in sales growth, employment growth, dynamics of the market share, return on sales, return on equity, gross profits
Conditions (independent variables)	
Corporate development (CD) – strategic focus on alliances, and acquisition	1. Form joint ventures with domestic business; 2. Form joint ventures with foreign businesses; 3. Merge and acquire other businesses; 4. Contemplated that the company should go public
New product development (NPD) – degree to the firm develops and introduces new products/services	1. Placed emphasis on developing new products through allocation of substantial financial resources; 2. Increased the rate of new product introductions to the market; 3. Increased its overall commitment to develop and market new products
External integration (EI) - level of integration/alignment with key customers and key suppliers	1. Our customers give us feedback on quality and delivery performance; 2. Customers are actively involved in our new product development process; 3. Customers frequently share demand information with our firm; 4. Our production/activity plans are shared with our customers; 5. We give our suppliers feedback on quality and delivery performance; 6. We strive to establish long-term relationships with our suppliers; 7. We have high corporate level communication on important issues with key suppliers; 8. We jointly develop new products/services with our suppliers
Internal integration (II) - level of inter-functional and interdepartmental integration/alignment"	1. All departments within our firm are connected by a single central information system; 2. We use cross functional teams to solve problems; 3. Communications from one department to another are expected to be routed through proper channels; 4. Formal meetings are routinely scheduled among various departments; 5. Our firm does not encourage openness and teamwork; 6. When problems or opportunities arise, informal, face-to-face meetings never occur
Entrepreneurial orientation (EO)	Nine item Covin, Slevin (1989) scale

Technological turbulence (TT) – rate of technological change	1. The technology in our industry is changing rapidly; 2. Technological changes provide big opportunities in our industry; 3. A large number of new product ideas have been made possible through technological breakthroughs in our industry
Competitive intensity (CI) - the nature of competition	1. Competition in our industry is cutthroat; 2. There are many “promotion wars” in our industry; 3. Anything that one competitor can offer, others can match readily; 4. Price competition is a hallmark of our industry; 5. One hears of a new competitive move almost everyday

Source: Based on identified sources

Overall seven causal attributes are conceptualized in this study. Two conditions related to the strategy domain are used, namely, strategic growth focus through corporate development and strategic growth focus through new product development. These are measured using the corporate development and new product development scales of Lau, Bruton (2011), and Covin, Slevin (1989), respectively. Two conditions related to the structure-design domain are used, namely, external integration mechanism and internal integration mechanism. These are measured using a scale adapted from Braunscheidel, Suresh (2009). Entrepreneurial orientation domain is measured using entrepreneurial orientation scales, adapted from Covin, Slevin (1989). Two conditions – highly turbulence technological environment and highly dynamic competitive environment – related to the environment domain. These are measured by adapting the technological turbulence and competitive intensity dimensions from Jaworski and Kohli’s (1993) business environment scale, respectively. Table 1 lists the items used in the questionnaire. Then, through calibration, elaborated in the fuzzy set Qualitative Comparative Analysis section, each firms’ membership score in the above defined set was assessed which was used in the creation and analysis of truth table.

### 3 Fuzzy set Qualitative Comparative Analysis

FsQCA is an inductive analytic technique, relying on set theory (Ragin, 2000). QCA facilitates the identification of multiple configurations of variables associated with an outcome of interest. It is an especially powerful approach, because it allows the analyst to derive configurations of key variables from case study evidence (including the grounded interpretations of quantitative data), which are associated with a focal outcome(s). The first step in fsQCA is to assess the membership score for each firm (case) in the sets of outcome and conditions. Four levels of membership of fuzzy sets are defined for all constructs. Four levels of memberships in a set mean that a firm is assigned the membership level “fully in” (= a fuzzy score of 1) if the raw

score on that construct is seven for that firm; likewise, a firm is assigned the membership level “more in than out” (= a fuzzy score of 0.67) if the raw score on that construct is five; the membership level “more out than in” (= a fuzzy score of 0.33) if the raw score on that construct is three; and the membership level “fully out” (= a fuzzy score of 0) if the raw score on that construct is one. For other raw scores, the fsQCA software (version 2.5) does the calculation based on the above criteria and produces a fuzzy-set membership score. After this, following standard procedures, each of the conditions and its absence is tested separately for being necessary or sufficient for the outcome using the XY plot method. No condition or its negation(absence) met the criteria specified.

Then, truth tables are constructed by choosing the consistency cut-off score for membership in a configuration (set of conditions) to be  $\geq 0.8$  (Fiss, 2011) and fsQCA software is used for Boolean minimization. The truth tables for logical configurations is reported in table 2.

**Tab. 2: Truth table for logical configurations**

Focus on corporate development	Focus on new product development;	High external integration	High internal integration	High entrepreneurial orientation	High technological turbulence	High competitive intensity	Number	High performance of the firm
0	1	1	0	1	1	0	8	1
0	1	1	0	0	1	0	4	1
0	1	1	0	0	1	0	5	1
0	0	1	0	0	0	0	3	1
0	1	1	0	1	1	0	2	1
0	1	1	0	1	0	0	1	0
0	0	1	0	0	0	0	2	0
0	0	0	0	1	1	0	5	0

Source: Author’s study

The truth tables can be read as follows. The first/title row lists the titles: input conditions (first seven columns), number of firms in each configuration (eighth column), and performance (ninth column). A cell value of “1” means the presence of a condition/outcome and “0” means its absence. Each row represents a configuration that is observed under the consistency constraints ( $> 0.8$ ). Boolean minimization of the truth table (table 2) led to five causal alternate pathways in the intermediate solution. Following Fiss’s (2011) suggestion, the result is presented with core (the conditions which are common in intermediate and parsimonious solutions) and peripheral conditions (found only in intermediate solutions) in figure 1.

**Fig. 1: Configurations (intermediate solutions with core and peripheral conditions)**

Conditions	Solutions				
	S1	S2	S3	S4	S5
Technological Turbulence (TT)	●		●		●
Competitive Intensity (CI)	⊖	⊖	⊖	⊖	⊖
Corporate Development (CD)	⊖	⊖	⊖	⊖	⊖
New Product Development (NPD)	●	●	⊖	●	●
External Integration (EI)	●	●	●	●	●
Internal Integration (II)	⊖	⊖	⊖	⊖	⊖
Entrepreneurial Orientation (EO)		●	⊖		●
Consistency	0.91	0.87	0.92	0.96	0.89
Raw Coverage	0.53	0.23	0.64	0.29	0.17
Unique Coverage	0.04	0.02	0.05	0.06	0.02
Solution Consistency	0.92				
Solution Coverage	0.65				
Notes:	● circle means presence of a condition; ⊖ circle means absence of a condition; smaller circle sizes indicate peripheral conditions; and large sizes indicate core conditions				

Source: Author's study

High internal integration, strategic focus on corporate development, and high competitive intensity environment is absent in all the five configurations. High external integration with suppliers and customers, however, is present in all the configurations. High strategic focus on new product development and highly turbulence technological environment are present in one and five configurations, respectively. High EO are present in two configurations (two and five).

## Discussion and conclusions

To provide plausible causal mechanisms, this paper adopts the view that founders/entrepreneurs enact their operating environment, assess resources, make strategic choices and choose structural design attributes to implement these strategic choices within resource and environmental constraints. Accordingly, the solution term in figure 1 is sorted and combined in that order. From the fsQCA five configurations are found to be leading to high performance. Of these, three can be written as:

$$TT * \sim CI * [\{\sim CD * NPD * EI * \sim * II\} + \{\sim CD * \sim NPD * EI * \sim II * \sim EO\} \\ + \{\sim CD * NPD * EI * \sim II * EO\}]$$

In set theoretical statements, “\*” means “and” and “+” means “or”. If technological changes in the environment are fast but competition is not that harsh, the industry has just begun and its boundaries and scope are probably not clear. Firms promote individual freedom, responsiveness, and flexibility over bureaucratic efficiency. The focus is on close collaboration with supply chain partners while avoiding inorganic growth options. Firms should focus on new product development especially if the firm as a whole practices innovativeness, proactiveness, and risk-taking. If the firm has constrains innovativeness, proactiveness, and risk-taking, it is best to avoid developing new products. As the technology is still evolving and the market is yet undefined, and new product development could seen as a measure to check the demands on the firm’s limited resources, especially when there is no competitive rush. The remaining two configurations can be written as:

$$\sim CI * [\{\sim CD * NPD * EI * \sim II\} + \{\sim CD * NPD * EI * \sim II * EO\}]$$

If firms are very highly integrated with their supplier-partners, they may enjoy leverage and favourable terms, and then the environment is no longer that competitive. Firms focus on new product development, basing their effort on high internal collaboration, sacrificing efficiency-enhancing mechanisms, and avoiding inorganic options. Such firms will benefit by highly innovative, proactive, and risk-taking firm-level decision-making proclivity, or they should avoid it.

Drawing on the existing configuration approach and advances in start-up configuration research, this paper employs entrepreneurial orientation, strategy, structure, and environment to explore the configurations of university spin-offs from Poland. The logic of using entrepreneurial orientation is driven by its characterization as an indicator of decision-making proclivity that is driven by the founding philosophy in young entrepreneurial firms. Given the exploratory nature of the study, consistency between the configuration approach and set theoretical methods of QCA, sample size constraints, and the scope for discovering causal complexities, fsQCA is used. Drawing on the particular strength of QCA to travel back and forth between data and theory, the plausible causal mechanisms are elaborated for various configurations. There is some consistency in the relationship of causes to outcomes across all configurations. In all five types of USOs successful configurations, the firms adopt high external integration, do not operate in a highly competitive industry, do not employ corporate development strategies, and do not exhibit high internal integration.

This paper studies the causal alternate pathways or configurations that determine the success of USOs from Poland. It is important to note that there is no single path leading to the high performance of those organizations. However, in order to obtain the full and more reliable picture of the entire functioning of spin-off companies in Poland, a continuation of the research is necessary, which will consider, on the one hand, a larger population of companies to be studied, and, on the other hand, the results achieved so far and the re-conceptualization of the configuration elements. Similarly, the calibration technique can be improved for developing more accurate measurements and would certainly need adaptation if studies were conducted in different settings. What is more, it is noteworthy that QCA may facilitate a more systematic and complete exploration of causal alternate pathways from case data than is possible using conventional approaches to comparative case analysis.

Furthermore, for the purposes of this exposition, the author allowed the software to assign outcomes to unobserved cases in a way that produced the most "parsimonious" solutions of truth tables (Ragin 2000). Practical applications would require the researcher to justify any such simplifying assumption in terms of theoretical or substantive knowledge of the area. Although this is an aspect of QCA that could be developed, it should be remembered that in almost all conventional quantitative analyses, a similar problem occurs: many regions of the vector space formed by the independent variables are devoid, or virtually devoid, of cases. In many research reports, the assumptions used to deal with these voids remain more or less invisible to both researchers and their audiences.

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## **WOMEN ON BOARDS: DOES GENDER COMPOSITION AFFECT FINANCIAL RESULTS OF COMPANIES?**

**Jolanta Maj**

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### **Abstract**

**Purpose:** The paper aims to answer the question on the number of women in the highest organizational bodies in Polish enterprises and whether there is a relationship between the compositions of boards due to gender of their members and financial results achieved by the companies and therefore to tell whether gender and/ or gender composition through inter alia a different management style or openness to risk influences the financial condition of organizations.

**Design/methodology/approach:** For the analysis 281 companies listed on the Warsaw Stock Exchange were analysed. Basic financial indicators disclosed in the annual financial reports for 2015 were chosen. The reports for 2015 were analysed from 1 till 10 February 2017. Using statistical analysis the financial indicators were juxtaposed with the number of women on boards. Also the number of women serving as chairman of the board was included into the analysis. Furthermore a regression analyses using dummy explanatory variables (women president of the board, women in management boards and women in supervisory boards) and three different dependent variables (ROA, ROS, ROIC) have been conducted.

**Findings:** The paper provides insight into the composition of boards in Polish companies listed on the Warsaw Stock Exchange due to gender. It shows that boards of these companies are highly masculine. The attempt to show relations between the gender composition and organizations financial performance were not entirely conclusive and need further analysis.

**Research/practical implications:** The paper includes implications for decision – makers. It can be used as a reference by regulatory bodies to further investigate on the means as to how board composition can influence the firm performance. It may also be used for SME's in a very crucial recruitment or succession process, which, due to SMEs limited capability needs to take all the important factors, like gender of the people in question into consideration.

**Originality/value:** The research contributes to the literature on the relationship between women participation on corporate boards and firms' performance. This paper fulfils a gap in the analysis of Polish enterprises with regards to board composition due to gender and the linkage of this composition with the firm's financial performance.

**Keywords:** gender diversity, corporate governance, board composition, firm performance, financial performance

**JEL Codes:** M14, M12

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## **Introduction**

Nowadays certain tendencies to regulate gender composition of boards of directors can be observed. One example can be the draft of the *EU Directive on improving the gender balance among non-executive directors of companies listed on stock exchanges*, which admittedly has been rejected by several EU Member States and thus so far put on ice by the EU. Another example is the Directive 2014/95/EU, which obligates certain organization to disclose non-financial and diversity information or good practices suggested by inter alia Warsaw Stock Exchange to disclose information on corporate governance and gender composition of the Board (Maj, 2016). These examples show, that at international and national level there are some attempts to regulate organizations corporate governance. Furthermore, due to socio-demographic processes like i.e. migrations and globalization (Rokita-Poskart, 2016), (Jończy & Rokita-Poskart, 2014), the diversification of the business environment and the boards itself will gain on importance. Therefore, a question must be asked whether gender or other dimensions in fact influence a company's financial performance and therefore whether such an external, legal, top-down regulation does not contradict the shareholders interest. Hence the main goal of this paper is to determine, if in fact gender composition of the board influences the firm's performance.

### **1 The inconclusive findings on the role of gender diversity**

Analysing the existing literature on the role of diversity and gender diversity on organizations performance one stumbles varied opinions and research results. Some researchers find that diversity leads to positive outcomes (Ashikali & Groeneveld, 2015) while others found that diversity can potentially lead to negative outcomes (Hambrick, Cho, & Chen, 1996). Also the findings regarding the influence of gender composition of the board on organizations performance is not unanimous.

Analysis conducted by consulting companies indicate, that the representation of women positively correlates with firm's financial performance. Catalyst (2007) (2011) analyzed Fortune 500 firms with emphasis on return on equity, return on sales and return on invested capital indicators and came to the conclusion, that companies with a higher rate of women on boards achieve generally better results than those with a smaller rate of women. Similar findings were presented by Mckinsey (2007) and Credit Suisse (2012). However, due to the fact that these are not academic studies, the findings can be treated skeptical. Nevertheless, there is also academic research that supports these findings. Isidro and Sobral (2015), as a result of their

research and the analysis of return on assets and return on sale indicators, came to the conclusion that women representation on boards is positively connected to financial performance. Ramly et.al. (2017) analyzing banks, came to the conclusion that, appointing women to the boards alone, does significantly enhance bank efficiency, however this changes, when women are also being appointed as independent directors. The gender diversity of the board may also be perceived as a way of gaining competitive advantage without the necessity of using advanced technology (Bębenek, 2016). However, there is also research, that indicates, that there is no significant correlation between gender composition of the boards and organizations financial performance (Hassan & Marimuthu, 2016) (Post & Byron, 2015), (Pletzer, Nikolova, Kedzior, & Voelpel, 2015).

Therefore, due to the inconclusive findings regarding the role of women and female representation on board and the question whether it has any influence on the firms' financial performance as well as due to the growing importance and interest towards this issue shown by decision-makers, the author decided to conduct research on Polish companies to try to verify the previous research results as well as add the perspective of Polish organizations.

## 2 Research methodology

For the purpose of this paper 281 organizations listed on the Warsaw Stock Exchange were analyzed. Financial reports for 2015 (January 1 - December 31, 2015) were included. Not all organizations listed on the Warsaw Stock Exchange could be included as some of them until the day the reports were downloaded (February 1-10, 2017) did not disclose that information, as well as foreign organizations or organizations which did not include the information about their corporate governance were excluded. The reports were analyzed towards three indicators included in the Catalyst analysis: Return on Assets (ROA), Return on Sales (ROS) and Return on Invested Capital (ROIC). In order to verify, whether gender composition of the boards influences the financial performance of the companies' regression analyses using dummy explanatory variables (women president of the board, women in management boards and women in supervisory boards) and three different dependent variables (ROA, ROS, ROIC) have been conducted. The dummy variables were developed according to the following scheme:

women CEO –  $W_1$ ,

$$W_1 = \begin{cases} 1 & \text{if a woman is the CEO} \\ 0 & \text{if not} \end{cases}$$

woman in management board –  $W_2$ ,

$$W_2 = \begin{cases} 1 & \text{if a woman is the management board} \\ 0 & \text{if not} \end{cases}$$

woman in supervisory board –  $W_3$ ,

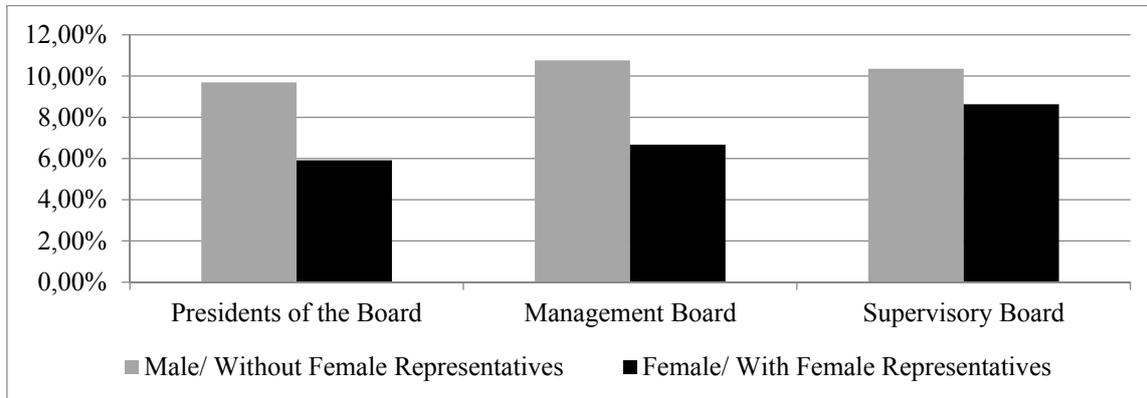
$$W_3 = \begin{cases} 1 & \text{if a woman is in the supervisory board} \\ 0 & \text{if not} \end{cases}$$

### 3 Research findings

The first general conclusion refers to the general number of men and women in the supervisory and management boards. In all 281 analyzed organizations women were represented only in 91 management boards. More than one woman was present in only 150 supervisory boards. Only in 19 of the analyzed companies women were presidents of the boards. Furthermore, even in the boards, where women were present, they still constituted a minority with 12% of all management board members and 14% of all supervisory board members. Therefore it is evident that women are underrepresented in the most important bodies of the organizations and therefore have a more limited access to power and decision-making.

The analysed indicators were juxtaposed with the gender composition among presidents of the boards as well as in the supervisory and management boards. The first analysed indicator is the Return on Assets (ROA). Its relation to the gender composition of the boards has been presented on Figure 1. ROA gives information about the results of organizations operating activities based on the amount invested in order to achieve those results. It shows how profitable a company is in comparison to its assets. ROA can be perceived as an indicator of the management to competencies to wisely allocate the organizations assets. However ROA is very dependent on the industry. This is why, for further, more detailed information, this indicator should be calculated not only divided by the gender composition of the board but also based on the industry of the particular organizations.

**Fig. 1: Relation of ROA to the gender composition of the management board, supervisory board and the gender of the president of the board.**

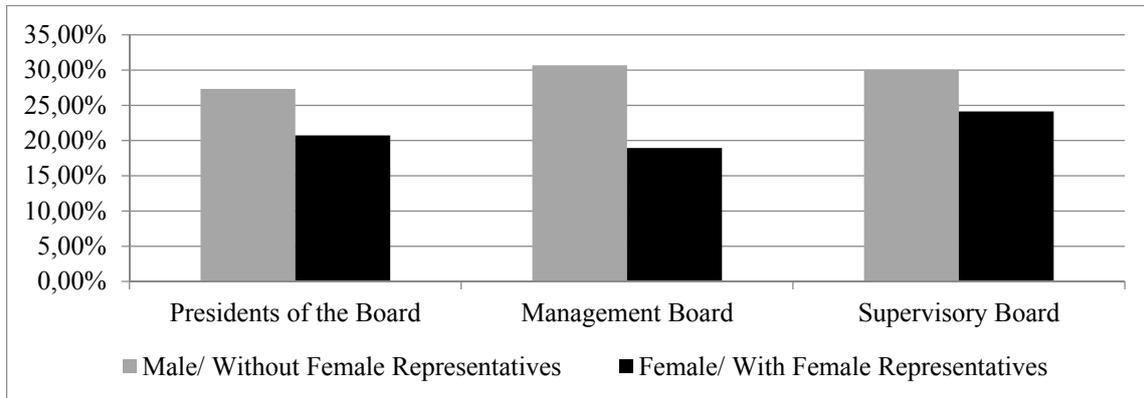


Source: own calculations.

However, based on Figure 1 it can be said, that generally, organizations with male representatives seem to achieve higher ROA than those with mixed board composition. Organizations with a male president of the board achieved 9.69%, while the ones with a female president only 5.91%. Also considering the composition of the management board, a conclusion may be drawn, that organizations with male boards achieve higher results (10.76%) than those with mixed boards (6.67%). The results considering the gender composition of supervisory boards show the same tendency: higher results were achieved by organizations with male boards (10.35%) than by those with male and female representatives in the boards (8.63%).

The second analysed indicator is the Return on Sales (ROS). Its relation to the gender composition of the boards has been presented on Figure 2. This indicator is being used to evaluate operational efficiency. It is also known as net profit margin. It gives information about the profitability of sales activities. As presented on Figure 2, organizations with male representatives on boards achieve better financial results respective the ROS indicator. However, ROS, as an indicator of organizations performance, is most efficient when it is being used to show and explain trends. Therefore, it would be beneficial to conduct this study in a longer period of time. Similarly, to ROA, it gives also much information, when it is being compared among single organizations from single industries. Organizations with a male president of the board achieved 27.33%, while the ones with a female president only 20.73%. Also considering the composition of the management board, a conclusion may be drawn, that organizations with male boards achieve higher results (30.68%) than those with mixed boards (18.95%).

**Fig. 2: Relation of ROS to the gender composition of the management board, supervisory board and the gender of the president of the board.**

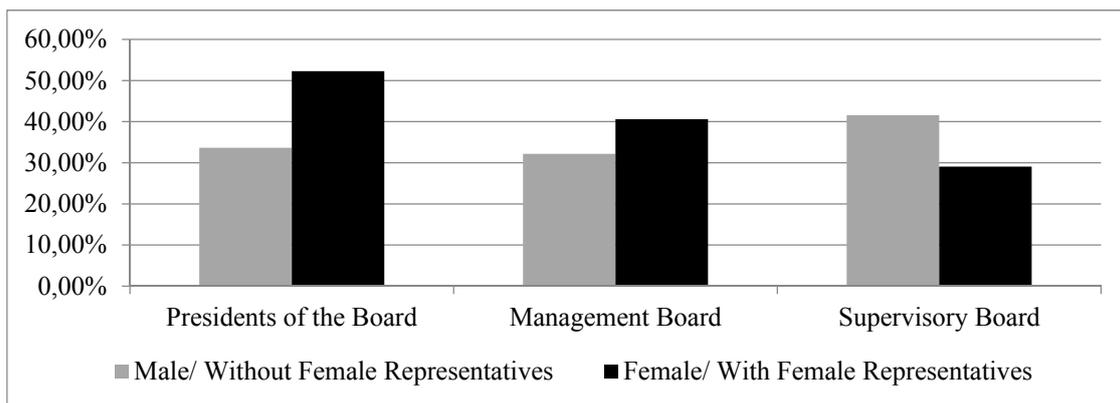


Source: own calculations.

The results considering the gender composition of supervisory boards show the same tendency: higher results were achieved by organizations with male boards (30,03%) than by those with male and female representatives in the boards (24,13%).

The final indicator used for the analysis was the ROIC indicator. Its relation to the gender composition of the boards has been presented on Figure 3.

**Fig. 3: Relation of ROIC to the gender composition of the management board, supervisory board and the gender of the president of the board.**



Source: own calculations.

This indicator is being used to determine how efficient the organization allocated its capital to profitable investments. It shows generally how well a company is using its capital to generate return. While ROA and ROS were more favourable towards boards consisting of male representatives, ROIC shows, that organizations with female presidents of boards achieve

higher results (52.29%), than organizations with male presidents (33.64%). Also results of organizations with mixed management boards achieved higher ROIC scores (40.59%) than those with only male representatives (32.18%). However, analyzing ROIC with regards to the gender composition of the supervisory boards, again the organizations with male boards scored higher (41.58%), than those with female and male boards (29.07%).

In order to verify, whether gender composition of the board's influences the financial performance of the companies' regression analyses using dummy explanatory variables (women president of the board, women in management boards and women in supervisory boards) and three different dependent variables (ROA, ROS, ROIC) have been conducted.

**Tab. 1: Regression equations before and after estimation**

Before estimation	After estimation
$ROA = \beta_0 + \delta_1 * W_1 + \delta_2 * W_2 + \delta_3 * W_3 + \varepsilon$	$ROA = 0.075 - 0.012 * W_1 + 0.003 * W_2 - 0.014 * W_3 + e$
$ROS = \beta_0 + \delta_1 * W_1 + \delta_2 * W_2 + \delta_3 * W_3 + \varepsilon$	$ROS = 0.482 - 0.095 * W_1 - 0.111 * W_2 - 0.173 * W_3 + e$
$ROIC = \beta_0 + \delta_1 * W_1 + \delta_2 * W_2 + \delta_3 * W_3 + \varepsilon$	$ROIC = 0.257 + 0.125 * W_1 + 0.054 * W_2 - 0.037 * W_3$

Source: own calculations.

The analysis presented in table no. 2 and table no. 3 shows, that there is no statistical relevance between the independent and dependent variables, therefore the gender of the president of the board and the gender composition of the management and supervisory boards have no influence on the firm financial performance in terms of ROA, ROS and ROIC.

**Tab. 2: Regression analysis for ROA, ROS and ROIC**

		Coefficient	Standard error	P> t
ROA	women CEO	-0.012	0.03	0.312
	woman in management board	0.003	0.015	0.855
	woman in supervisory board	-0.014	0.013	0.692
	constant	0.075	0.011	0
ROS	women CEO	-0.095	0.26	0.715
	woman in management board	-0.111	0.134	0.408
	woman in supervisory board	-0.173	0.116	0.139
	constant	0.482	0.092	0
ROIC	women CEO	0.125	0.114	0.277
	woman in management board	0.054	0.059	0.363
	woman in supervisory board	-0.037	0.051	0.471
	constant	0.257	0.041	0

Source: own calculations.

**Tab.3: Summarized regression analysis for ROA, ROS and ROIC**

	Model of ROA	Model of ROS	Model of ROIC
R-squared	0.004	0.012	0.014
Prob > F	0.779	0.334	0.267
F(3,272)	2.638	2.638	2.638
Root MSE	0.11	0.953	0.419

Source: own calculations.

Table no. 4 presents the summary statistics for the dependent variables: ROA, ROS and ROIC.

**Tab. 4: Summary statistics**

Variable	Summary statistics						
	Average	Median	Minimum	Maximum	Lower quartile	Upper quartile	Standard deviation
ROA	0.068105	0.037672	-0.20349	0.881179	0.012704	0.084043	0.109698
ROS	0.349135	0.066482	-2.23058	5.598802	0.026342	0.220695	0.953861
ROIC	0.262409	0.13397	-0.11561	3.092535	0.008049	0.305369	0.419722

Source: own calculations.

## Conclusion

Although the analysis of ROA and ROS may suggest that organizations with boards dominated by male representatives achieve better results, such a conclusion would be a simplification. The analysis of ROIC showed, that organizations with female presidents of the boards and female representatives in management boards are more efficient in allocating their capital to profitable investments. Furthermore the regression analysis showed that there is no statistical relevance between the independent and dependent variables, therefore the gender of the president of the board and the gender composition of the management and supervisory boards have no influence on the firm financial performance. The inconclusive findings suggested, that issue needs further and deeper analysis. The paper presents only a small part of the organizations financial statement and financial performance. In order to get the full picture on how gender composition of the board affects the organizations financial performance other financial indicator should be analyzed. Furthermore, it would be beneficial to analyze how the indicator changed over time and juxtapose it with changes of the gender composition of the board. As suggested, it would have to be checked, in which point and which financial situation women joined the organizations boards or became president of the board. Furthermore a cross industry analysis would also be of interest, as many financial indicators differ significantly across different industries. Also a conduction of more advanced statistical analysis would be beneficial. Although the findings concern companies listed on the Warsaw Stock Exchange, the results can also be of importance to SMEs in very crucial recruitment or succession processes, which, due to SMEs limited capability need to take all the important factors, like gender of the people in question into consideration.

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## NEWCONNECT AS A SOURCE OF FINANCING FOR SMALL AND MEDIUM-SIZED ENTERPRISES

Joanna Malecka

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### Abstract

**Purpose:** Given that it concentrates market demand for financial instruments offered by issuers, the stock exchange is an ideal source of raising capital on favourable terms. Public issuance allows more reliable access to potential investors, with potentially higher issue prices. Skilful seizure of such opportunities can provide companies with development funds and improve their market position in line with their stated objective. Why then do so few companies use the main tool of the capital market in Poland? The article presents NewConnect as an alternative financing source for SMEs, collating it with the awareness of Polish entrepreneurs in this respect.

**Design/methodology/approach:** Findings are based on source data from various publications by financial market institutions. The volume and structure of Europe's selected alternative markets are outlined by means of analyses, figures and comparisons. The focus is on commercial companies allowed to cooperate with stock exchanges. To calculate and visualise the findings, mathematical analysis tools were employed to determine quantitative and percentage shares illustrating the examined structures and to outline a trend analysis based on linear regression. 200 respondents were interviewed for recognisability of capital market instruments in Poland and their knowledge and ability to raise development capital in this way.

**Findings:** The capital market development and increasing competition are posing new challenges for SMEs, whose changing way of thinking should be transformed into actual changes in their business activities. The data show that this change, although very slow, is nonetheless underway and SMEs' interest in capital market solutions is increasing year by year.

**Research/practical implications:** The author's research results have revealed a correlation between respondents' education and their knowledge and ability to differentiate the capital market from the money market. The better educated a respondent was at the time of the research, the more broadly he/she assessed the range of capital market solutions and opportunities for raising development capital through the stock exchange and NewConnect. This is, however, not combined with the maturity in respect of correct estimation of risks or opportunities for raising capital for development of one's own entrepreneurship in this way.

**Originality/value:** Small enterprises whose owners consider raising capital through the stock exchange as part of strategic management and business philosophy will be offered an additional opportunity for relatively easy access to capital, enabling companies to develop and increase their prestige. The author's own research results have shown that it seems necessary to modify the traditional paradigm of SME management in the aspect of SME owners' leading role.

**Keywords:** WSE, NewConnect, stock exchange, SME

**JEL Codes:** G10, G32, L11, O16

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## Introduction

A free market economy is characterised by a functioning financial market, which has become an ambiguous concept since it covers several aspects of various markets. The total value of the global financial market is constantly increasing. Over thirty years of operation have resulted in more than nineteenfold growth: USD 12 trillion in 1980, USD 56 trillion in 1990, and estimated USD 225 trillion in 2012 (McKinsey Global Institute, 2011). Because of the many meanings of the term in economics, it is assumed that the financial market is understood as a place where companies seek funds to finance their operations (Galbraith, 1957, pp. 124–133; Fritsch & Story, 2014, pp. 939–954). In this case, the money market attracts attention when short-term (up to one year) investments are made. Only thoughts of long-term investments, contributing to the development of companies, draw the attention of entrepreneurs towards the capital market and the issuance of stocks and bonds. The capital market is a market for financial instruments, known as medium- and long-term, where the redemption period is at least one year or is not specified (see also: Małecka, 2017, pp. 34–43). Due to their nature, these instruments are primarily used to finance investments, and rarely can they satisfy the current needs of enterprises. Capital market instruments have, as a rule, the nature of securities. Capital recipients prefer long-term capital as a source of financing (Płókarz, 2013, p.131), as it has the same meaning for small, medium and large companies. SMEs, which are classified according to their size in the literature and the European Union (Cassar & Holmes, 2003, pp. 123–147; Articles 104–106, Journal of Laws 2004, No. 173<sup>22</sup>), mark their contribution to the global economy through structural changes and through setting the framework for socio-economic development, while also affecting major macroeconomic indicators. They determine the trend of economic development, especially visible through changes in local or regional markets (see also: Fritsch & Story, 2014, pp. 939–954).

The capital market concerns trading in securities, and the principal place of such transactions is the stock market. In Poland, the meeting place for investors who want to buy stocks and enterprises that want to raise capital for development through the issue of shares is the Warsaw Stock Exchange (see also: Flores & Szafarz, 1997, pp. 91–105; Małecka, 2017, pp. 34–43). Markets for small and medium-sized enterprises can function as separate floors run by

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<sup>22</sup> Art. 104–106, Journal of Laws 2004, No. 173, item 1807, p. 54; Annex 1 of Commission Regulation (EC) No 364/2004, OJ L 124, 20.05.2003; Annex 1 of Commission Regulation (EC) No 364/2004 of 25 February 2004 (Extract from Commission Recommendation 2003/361/EC of 6 May 2003 concerning the definition of small and medium sized enterprises, OJ L 124, 20.5.2003, p. 36).

stock exchanges, as parts of the stock market, or as stand-alone exchanges (WSE, 2015, pp. 3, 6). In practice, however, independent SME exchanges are rare, and most floors dedicated to them are operated by stock exchanges. Micro-entrepreneurs, who are the most abundant among enterprises from the SME sector, are also able to take advantage of this source of financing through schemes aimed at the smallest entities that focus their business around innovation and modern sections of the industrial and services sectors, the so-called start-ups (see: Cassar, 2004, pp. 261–283; Fourati & Affes, 2013, pp. 244–254; Blair & Marcum, 2015, pp. 249–265; Małecka & Łuczka, 2016, pp. 418–431). In Poland, a market dedicated to small and medium-sized enterprises is the NewConnect, which is a market for shares, based on the alternative trading system operated by the WSE. Despite the initial assumptions that this market would concentrate on innovative sectors, such as IT, new technologies, eco-energy, life sciences, companies from more traditional industries also trade there. Why then do so few Polish enterprises take up the opportunity to raise capital for development through this market? Why do only few entrepreneurs take advantage of the capital market? More liquidity associated with money market instruments is probably one of the reasons (Łuczka, 2011, pp. 55–70), but the development that can be achieved by using funds raised through the stock exchange is much greater (Małecka, 2016b, pp. 11–24). Perhaps it is incomplete knowledge about the NewConnect market, its opportunities and performance since 2007 that constitutes a barrier affecting the current degree of interest in these solutions. The article identifies the main characteristics of the Polish stock exchange that make it the best developing market in Central and Eastern Europe and those of NewConnect – a market primarily intended for small and medium-sized enterprises.

## **1 Warsaw Stock Exchange as the most dynamic market in Central and Eastern Europe**

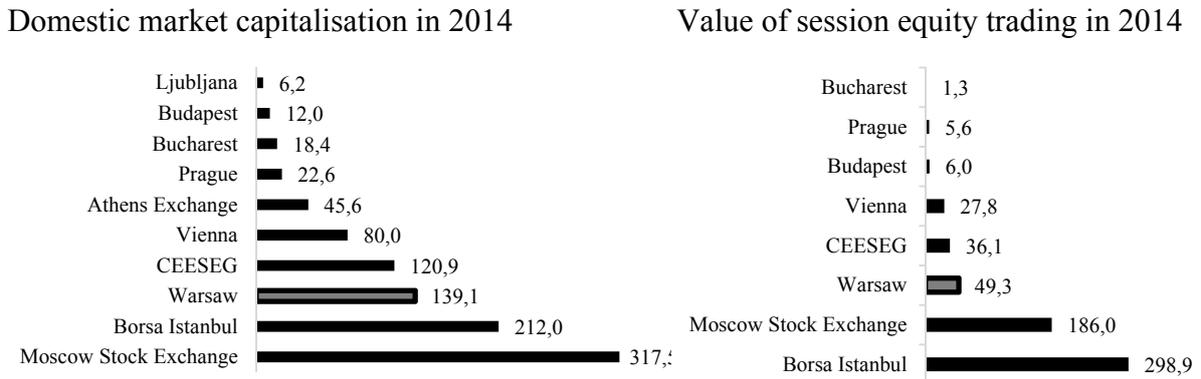
The public market and the derivatives market are the most prestigious forms of functioning on the capital market. They are becoming of increasing importance in real economic processes in all developing economies of the world (see also: Płókarz, 2013). On the public market, securities are offered to a wide range of potential investors. This may be done in the form of a stock exchange or in the form of an over-the-counter (OTC) market. In a properly functioning market economy, this market should be a natural stage in the development of a company as well as an effective source of securing additional sources of financing. Companies offering their shares in a public offering can reach a wide audience of potential customers – from small

investors to investment funds (Flores & Szafarz, 1997, pp. 91–105; Małecka, 2016a, pp. 91–122). With the status of a listed company, they also gain the prestige associated with membership of an elite group of companies, which is positively perceived by the business environment and, in the case of the SME sector, has a direct impact on the quality of cooperation with banks (Galbraith, 1957, pp. 124–133; Łuczka, 2002, pp. 277-290; Cassar & Holmes, 2003, pp. 123–147). The derivatives market is a part of the financial market on which futures and forwards contracts are concluded. The objects to be traded are contracts for transactions that will take place at a specified date in the future. The underlying instrument, that is the price of a product, is determined at the time of entering into a contract.

The Warsaw Stock Exchange is the biggest and most liquid stock exchange in Central and Eastern Europe. Its position is evidenced by the GDP results achieved in Poland in 2008–2016, which present Poland as the fastest growing economy in Europe, with a balanced and solid financial system, a downward trend in the deficit and public debt in relation to GDP in 2008–2014, and accumulated GDP growth of 24.2%, placing it among leaders in the European Union (EU – 28 countries – 0.2%; euro area – 18 countries – 0.2%).

The current economic situation results in the strong presence of major global investors, as well as a large and growing customer base: issuers, investors, traders, intermediaries, data vendors. The WSE is seen as a vibrant commodity market with significant growth potential. This is confirmed by the results achieved in 2014: domestic market capitalisation (EUR 139.1 billion) and the value of session equity trading (EUR 49.3 billion) that put the Polish stock exchange in the third place in this part of Europe, right after Moscow and Istanbul (Figure 1). The number of companies on the primary and parallel markets amounts to 474 business entities, of which 422 represent domestic companies and 52 foreign issuers, with capitalisation of PLN 610 billion (EUR 145.7 billion) and PLN 716 billion (EUR 170.9 billion) respectively (www.gpw.pl, 28.06.2015).

**Fig. 1: Domestic market capitalisation and value of session equity trading in 2014 (in billions of EUR)**



Source: elaborated by the author on the basis of WSE, 2015, p. 6.

The WSE performance should convince the Polish entrepreneur to collaborate with it when making decisions about development and searching for funds to implement planned and calculated investments. Even more so since the characteristics of SMEs often result in those enterprises facing significant credit discrimination when attempting to obtain a bank loan<sup>23</sup> (see: Galbraith, 1957, pp. 124–133; Łuczka, 2002, pp. 277–290), which usually forces them to prefer internal financing sources (Myers, 1984, pp. 575–592). Why, then, with the existence of the stock exchange, an alternative and favourable tool, do so few Polish entrepreneurs take advantage of this opportunity? There is a problem of lack of awareness of Polish entrepreneurs and lack of knowledge of the principles of functioning of the capital market and its most important instrument, namely the stock exchange, which is still a less popular means of raising capital for development than banks. The market on which the shares of the smallest companies in Poland are listed is known as NewConnect. Let us, therefore, take a look at the statistics for this very new market<sup>24</sup> and its main indicators.

## 2 Evolution of the NewConnect market in Poland in 2007–2016

Companies wishing to raise capital for development can take advantage of several existing options. Among others, these include PE (Private Equity) and Start-Up solutions, and the following markets: IPO (Initial Public Offering) and NewConnect, where the shares of the smallest companies in Poland are listed (see: Cassar, 2004, pp. 261–283; Fourati & Affes, 2013, pp. 244–254; Blair & Marcum, 2015, pp. 249–265; Małeczka & Łuczka, 2016, pp. 418–431;

<sup>23</sup> Companies from the SME sector are often offered higher margins, must meet additional requirements regarding security, and are subject to closer scrutiny than large companies.

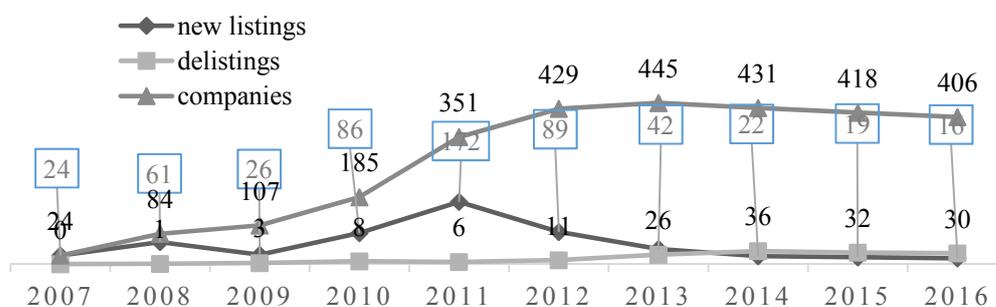
<sup>24</sup> The NewConnect market has been operating as an alternative trading system in Poland since 30 August 2007.

Małacka, 2016b, pp. 11–24). This market is not regulated, which in practice means fewer formalities and less restrictive conditions for being listed, as well as low costs of issuing shares<sup>25</sup>. Most companies choosing this market also benefit from rights to private placement, where even the disclosure obligations are limited to a minimum.

After only four years of operation, the Polish NewConnect became the second largest alternative market in Europe in terms of the number of listed companies. When analysing the total capitalisation of companies, it takes the ninth place, due to the market segment for microbusinesses on the European scale (WSE, 2015). It has gained interest chiefly among individual investors, who account for 70% of turnover and accept the increased risk associated with activities on this market in exchange for potentially high returns on their investments<sup>26</sup>. Also Authorised Advisers (AA) are active on NewConnect, and their operations are supervised by the WSE.

The number of companies listed on NewConnect had increased regularly since the market's inception by 2013, reaching 445 listings (Figure 2). The year 2016 ended with 406 companies with a total capitalisation of PLN 9,799 million (PLN 9,476 million for domestic companies, PLN 323 million for foreign companies).

**Fig. 2: Number of new listings, delistings and companies on the NewConnect market in 2007–2016**



Source: elaborated by the author on the basis of NewConnect, 21.02.2017.

It is worth making a careful analysis of the internal structure of new listings on this market, because the share of foreign companies among those newly listed is definitely increasing year by year, whereas the share of domestic companies is shrinking (Table 1) (Figure 3). In 2014, their shares virtually equalised, and despite a decrease in the percentage of new

<sup>25</sup> The basic requirements include: the legal status of the company (joint-stock or limited joint-stock company), cooperation with an Authorised Adviser and market maker and the preparation of an information document.

<sup>26</sup> NewConnect offers various possibilities for allocating capital, choice of companies based on their size, level of development, business activities and sector specificity, also taking into account market indicators.

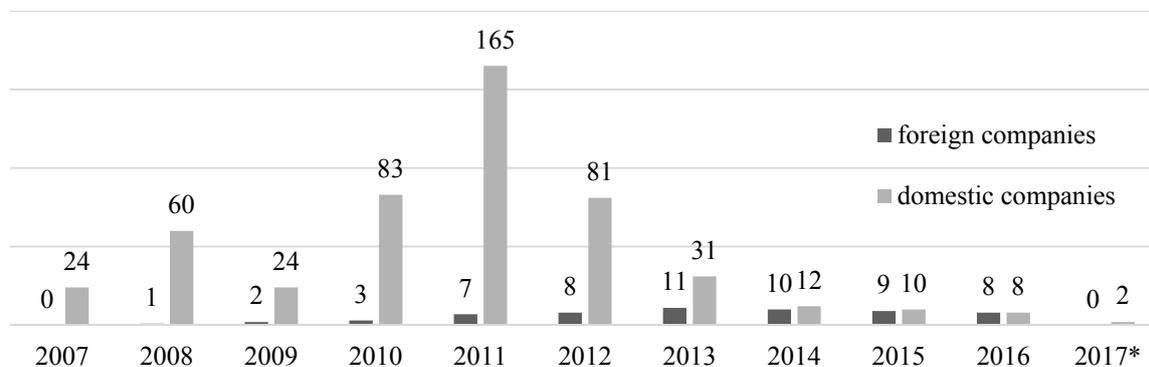
listings in the total, the share of foreign companies is still rising (Table 1). These statistics have their reflection in the persistent growth of commercial companies with foreign capital in Poland as well as in the growth of limited joint-stock companies (Table 2).

**Tab. 1: The share of new foreign listings on NewConnect in 2007–2016**

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Share of new foreign listings [in%]	0	1.6	7.7	3.5	4.1	9.0	26.2	45.5	47.4	50.0

Source: elaborated by the author on the basis of NewConnect, 21.02.2017.

**Fig. 3: Number of new domestic and foreign listings on the NewConnect market in 2007–2016**



Source: elaborated by the author on the basis of NewConnect, 21.02.2017.

**Tab. 2: Growth of companies by ownership sector in Poland in 2003–2015 [in %]**

YEAR	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Commercial companies	6.14	5.47	4.74	5.53	6.15	4.12	5.49	6.81	6.41	8.21	9.62	8.18	10.41
Joint-stock companies	0.37	-0.09	-0.30	0.08	2.77	-0.12	1.44	3.94	5.10	3.93	3.03	3.85	4.45
Limited joint-stock companies	n/a	n/a	86.96	153.49	133.03	103.54	38.10	47.06	44.10	86.12	102.73	8.15	-10.39

Source: elaborated by the author on the basis of CSO from 2001–2016.

The NewConnect market is characterised mainly by two parameters: the number of listed companies (including newly-listed ones) and their value (capitalisation, equity turnover, liquidity). In Europe, these two indicators are dominated by the London AIM (see: Małecka, 2016b, pp. 11–24). That market, however, has been in operation for much longer than the Polish one – since 1995, and since 2004 it has been functioning as an MTF. NewConnect is the second

alternative market in Europe in terms of the number of listed companies – 431 (at the end of 2014, in terms of: capitalisation in the ninth place – EUR 2,029 million; value of equity trading in the ninth place – EUR 338 million; liquidity in the sixth place – 17%) (Table 3). The nature of NewConnect is directly linked to the specificity of the Polish economy, which is dominated by microbusinesses. A greater part of the shares usually remains in the hands of the founders, strategic investors or private equity or venture capital firms. With its 17% liquidity ratio, NewConnect is one of more liquid markets and qualifies as one of those alternative markets in Europe that allow actual trading in shares.

**Tab. 3: Comparison of the number of selected alternative markets during the years of NewConnect’s operation (2007–2014)**

<b>Number of companies at the end of the year:</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
United Kingdom	1694	1550	1293	1195	1143	1096	1087	1104
<b>Poland</b>	<b>24</b>	<b>84</b>	<b>107</b>	<b>185</b>	<b>351</b>	<b>429</b>	<b>445</b>	<b>431</b>
Euronext	119	128	125	155	180	180	184	191
Germany	112	115	116	129	134	183	188	169
Luxembourg		159	202	219	232	233	217	166
NASDAQ	126	132	129	124	130	122	131	161
Turkey				31	61	77	89	94
Slovakia		69	65	75	66	65	64	64
Italy			5	11	14	18	36	57
Norway			28	34	38	34	32	35
Spain				12	17	22	23	26
Ireland	30	27	25	23	25	23	25	26
Hungary					10	23	23	23
Austria	22	21	19	28	25	22	24	21
Cyprus				6	9	15	19	21
Greece		9	12	14	14	14	14	14

Source: WSE, 2015, p. 10.

### **3 The capital market in Poland in the light of empirical research**

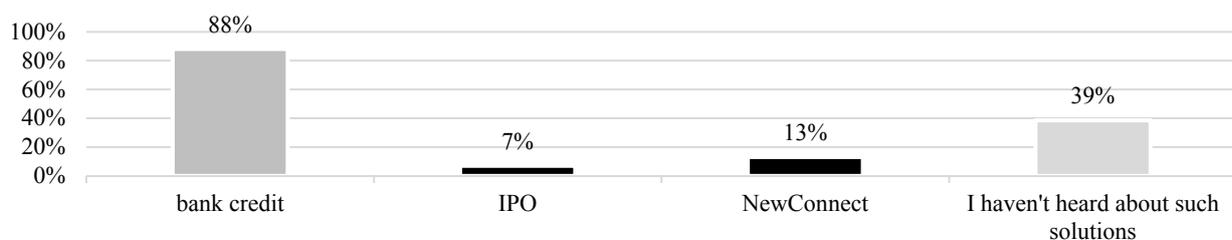
Research conducted by J. and K. Kuczowic in 2012 in Silesia<sup>27</sup> shows that despite the fact that 88% of the surveyed entrepreneurs started their businesses on their own, only 6% admit that they could sell their companies, with the majority of those respondents being people with higher education. 45% of the respondents may consider such an option in the future, and 42% of companies are managed by people with higher education. Studies have revealed that changes in the approach to business are determined by the level of education of entrepreneurs (Kuczowic J. & Kuczowic K., 2013, pp. 369–371). Naturally, to be able to draw full conclusions, a similar

<sup>27</sup> Survey respondents included owners and managers of 146 enterprises employing up to 50 people.

study should be extended to cover the rest of the country and the survey should be expanded by adding a detailed question about the sale of shares in companies. However, this sample has demonstrated how important the qualitative parameters of enterprises are in this sector, since they determine a specific management approach (autocracy of the owner and his/her family) and directly influence the choice of sources of funding for managed companies.

The research conducted by the author among 200 respondents in 2016 in the Wielkopolskie region has shown that the knowledge about the capital market is only minor among entrepreneurs or persons who intend to start their business in the next three years. Respondents represented different sectors, and their common characteristic was the wish to deepen their management expertise and become more capable of accessing sources of financing for their own businesses in logistics companies, by improving their qualifications and completing their education in this field. All of them represented the SME sector or were directly interested in running a business of this size. Nearly 63% of the respondents were women and 37% were men aged 18 to 65 years. 92% of the respondents regard the financial market and the capital market as synonymous, and the only recognisable financial market institutions are banks, with which 88% of the respondents cooperated in order to obtain a source of financing. The notion of the stock exchange is associated with risk, and the term NewConnect is recognised by only 13% of the respondents.

**Fig. 4: Recognition of capital markets among respondents**

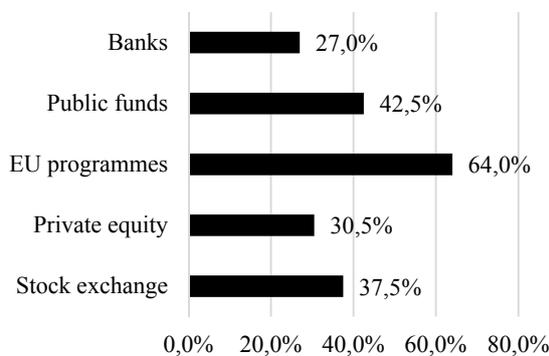


Source: author's own research.

Surprisingly, there is a lack of willingness to acquire additional knowledge about capital market instruments. Although 39% of the respondents had not even heard about NewConnect and did not associate it with the stock exchange, fewer than 38% expressed their willingness to attend related training provided it was free of charge, and one eighth regarded such training as not worth of paying more than EUR 50. The vast majority are interested in EU programmes (nearly 50% of the respondents would participate in such training if it cost up to EUR 125, and only 13.5% expressed such a desire if the prices were higher). The stock exchange and potential

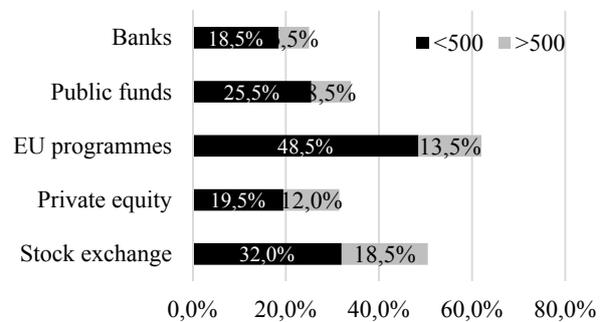
sources of financing were classified as second (32% for a price not exceeding EUR 125 and 18.5% for higher costs) (Figures 5 and 6). In general, about 64% of the respondents are interested in information about EU programmes and knowledge about how to apply for such funding, followed by public funds, stock exchange (including NewConnect) and private equity solutions (42.5%; 37.5%; 30.5%, respectively). The share of those surveyed who are absolutely uninterested in additional knowledge enabling a more efficient selection of sources of financing in companies does not exceed 8%.

**Fig. 5: Declared willingness to acquire knowledge about sources of financing**



Source: author's own research.

**Fig. 6: Acceptability of financial involvement in training**



Source: author's own research.

The author's research results have revealed a correlation between respondents' education and their knowledge and ability to differentiate the capital market from the money market. The better educated a respondent was at the time of the research, the more broadly he/she assessed the range of capital market solutions and opportunities for raising development capital through the stock exchange and NewConnect. This is, however, not combined with the maturity in respect of correct estimation of risks or opportunities for raising capital for development of one's own entrepreneurship in this way.

## Conclusion

A company listed on the stock exchange (particularly in the public market) definitely improves its image for its counterparties. The confidence in the company is enhanced, regardless of business sector and type of relationships among entities. The Polish SME sector is dominated by microbusinesses, but the share of small firms is about half the EU average. The average survival rate of a company in Poland is 76%, dropping to an average of 32% after five years of

activity in the market. These indicators have a direct impact on the shape and size of NewConnect. By the end of 2014, 431 companies were listed there, of which 35 moved to the WSE Main Market, which evidences the potential of small and medium-sized enterprises. When making the courageous decision to liaise with the stock exchange, they themselves notice the even greater opportunities and benefits that come with further and more complex requirements for issuers in the primary market. Compared with the number of SMEs operating in the market, their share in raising capital for development through NewConnect is very small. However, it is increasing year by year.

Small enterprises whose owners consider raising capital through the stock exchange as part of strategic management and business philosophy will be offered an additional opportunity for relatively easy access to capital, enabling companies to develop and boost their prestige. The mentality of Polish small and medium entrepreneurs and their openness to third-party investors are also likely to be of crucial importance here. In this regard, it seems necessary to depart from the traditional paradigm of management of small and medium-sized enterprises mostly as family businesses in which decision-making processes are dominated solely by their owners (often family).

The capital market development and increasing competition are posing new challenges for SMEs, whose changing way of thinking should be transformed into actual changes in their business activities. The data show that this change, although very slow, is nonetheless underway. The capital market for small businesses will grow, but this must be accompanied by the development of management methodology of small business values. The issue should be studied more deeply by responding to another question about the rooting of the traditional model functioning in SMEs. Such a model is often a way of life for the owners (family) and reflects their openness to change and their social attitude towards management and development of strategic and operational plans that today tend to be unfamiliar terms for entrepreneurs from this sector. This also holds true for the topic of the stock exchange, the principles of its functioning and, most of all, the opportunities it offers.

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## REFLECTION OF ETHICAL PRINCIPLES IN CZECH CODES OF ETHICS

Radim Maňák – Martina Nikolskaja – Tomáš Tykva – Monika Jones

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### Abstract

**Purpose:** The paper deals with the code of ethics as a significant tool of business ethics. Its objective is to evaluate a chosen set of Czech codes of ethics from different points of view and to find typical characteristics and specifics of these documents. The attention focuses on form and content criteria.

**Design/methodology/approach:** A basic analysis of form, content and structure of a set of codes of ethics used in the praxis was carried out in this paper. The first phase of the research formulates the theoretical base and identifies the criteria for the empirical research. The research is carried out on a chosen set of 20 codes of ethics of individual companies in the Czech language available online. These codes are evaluated from the point of view of their form and content on the basis of discourse and genre analyses. The main characteristic features of the chosen set of codes of ethics are identified.

**Findings:** The gained results help to show the profile of a typical company Czech code of ethics. It is typically not longer than 6 standard pages and has an entry part that could be understood as a preamble. The code is mostly classified by problem areas and offers personal text style. The majority of the codes do not have explicitly defined values, but almost all of them accentuate the observance of law.

**Research/practical implications:** The results of the paper, as described in findings, can be used by the management of companies that should respect specific content and form aspects when creating their codes of ethics. For the science, it is important that the principles of business ethics find their application in the Czech business environment and in the available tools of business ethics although often in coexistence with law principles which are not the key topic of business ethics.

**Originality/value:** The paper studies a real and present-day set of documents and brings original results in this field of study.

**Keywords:** Business ethics, Code of Ethics, Ethical Principles

**JEL Codes:** M12, M14

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## **Introduction**

As the dictionary says, code of ethics is a written set of guidelines issued by an organization to its workers and management to help them conduct their actions in accordance with its primary values and ethical standards. The code of ethics should not be used only for the internal needs of the organization but its application should be positively reflected in the organization's communication with its environment. The code of ethics does not constitute a tool of ethical management but in today's global, multicultural environment it can be a fixed point and the tool for reducing communication problems.

Until we live in an ideal world where the ethical approach to solving all the key issues of each individual is natural, there will be a lot of space to research this topic. The human society is still very far away from the vision of an ideal world; therefore, a lot of work and challenges is in front of researchers in the field.

This paper focuses on evaluation of a chosen set of Czech codes of ethics from different points of view and finding typical characteristics and specifics of these documents. The first phase of the research formulates the theoretical base and identifies the criteria for the empirical research. Presented results can be used by the management of companies as a notion for the creation of their codes of ethics. Moreover, it is important to show how the principles of business ethics find their application in the Czech business environment and in the available tools of business ethics.

## **1 Code of Ethics as a Tool of Business Ethics**

A lot of attention was dedicated to the area of business ethics and its tools in the last years.

This area is covered by two concepts and an array of expert literature about both concepts is readily available – business ethics (Rolný, 2014; Remišová, 2015; Seknička, Putnová, 2016) as well as corporate social responsibility (Kuldová, 2010; Pavlík et al., 2010; Zdražilová et al., 2010; Kunz, 2012; Kašparová, Kunz, 2013).

Business ethics is also examined in special context. Šmajš, Binka and Rolný (2012) discussed this area in connection with environmental issues, Schelle, Janotová, Schelleová the professional ethics (2010) and Merhaut (2013) the ethics in the hotel industry. It is also examined as an aspect of human resources management (Bláha et al., 2013; Horváthová, Bláha, Čopíková, 2016).

The interest about ethical approaches manifests not only in books, but in research articles, too. Paulík, Sobeková Majková, Tykva and Červinka (2015) researched the impact of CSR concept on financial performance in banking sector.

One of the tools of implementation of business ethics into company management is code of ethics. Bláha et al. (2013, p. 226) consider code of ethics as one of the basic tools of business ethics implementation into business, whereas Seknička and Putnová (2016, p. 146) view it even as the most significant and applied tool of ethic management.

A lot of authors present **definition** of this tool. Code of ethics can be defined as a complex of basic ethic principles and norms (Schelle, Janotová, Schelleová, 2010, p. 18), as a systematically worked out set of norms and regulations that regulates relations of members in specific community (Rolný, 2014, p. 89; Horváthová, Bláha, Čopíková, 2016, p. 115), as a document which expresses basic principles of ethical behaviour in specific area or company (Zdražilová et al., 2010, p. 126) or as a set of written moral norms that are symbolic and express themselves only in the context of social behaviour (Merhaut, 2013, p. 38). These approaches accentuate code of ethics as a set of moral or ethical norms that regulate behaviour of company members.

More specifically, it is a document used by organization to promote ethical behaviour and decision-making processes. In the code of ethics, the organization describes and in more detail specifies a common value system and ethical principles in business practice with the aim to ensure that the actions of employees correspond with the specific rules (Kunz, 2012, p. 51). Similarly, Kašparová and Kunz (2013, p. 119) understand code of ethics as significant means for companies to promote ethical behaviour and decision making. It can be stated that code of ethics provides more detailed elaboration, specification of moral principles and their usage in company (Horváthová, Bláha, Čopíková, 2016, p. 115).

The main **function** of the code of ethics is to regulate the behaviour of business units. Other functions which can be derived from this are e.g. managing, preventive, supporting, informative etc. (Schelle, Janotová, Schelleová, 2010, 18). It presents a clear guideline to how to act in various situations (Zdražilová et al., 2010, p. 126). The goal of the standards is to anticipate ethical conflicts, prevent them and make the whole process more efficient (Merhaut, 2013, p. 38). Horváthová, Bláha and Čopíková (2016, p. 117) accentuate that the code of ethics eliminates unwanted practice, improves reputation of organization, clarifies company politics in moral questionable issues and defines acceptable and unacceptable behaviour.

Shelle, Janotová and Schelleová (2010, p. 18) evaluate the code of ethics as one of the most important regulators or ethical behaviour which should act as a prevention of unethical

behaviour and as a moral standard. In business organizations, a code of ethics can facilitate communication and complement the law if the law is too vague or indirect (Šmajš, Binka, Rolný, 2012, p. 175).

Januš (2014, p. 18) mentions as a specific trait of the code of ethics the fact that it can protect a firm, a bank in Januš's example, from criminal liability.

However, these functions and goals are not guaranteed; the code of ethics can become an empty document without authenticity. It can also be used just to improve an image of the company or as regulating principles which are related to work duties and not to ethical behaviour (Horváthová, Bláha, Čopíková, 2016, p. 117).

Three basic **types** of codes can be determined: aspiration codes expressing ideals, education codes consisting of a set of precisely defined instructions, and lastly regulation codes providing a set of detailed rules of professional behaviour which serve to solve complaints (Schelle, Janotová, Schelleová, 2010, p. 19; Seknička, Putnová, 2016, p. 148).

Other classifications distinguish company codes of specific companies or their parts and vocational codes of various associations (Horváthová, Bláha, Čopíková, 2016, p. 115) or more detailed professional codes (for teachers, lawyers), branch codes (for banking, advertisement) and company codes (Schelle, Janotová, Schelleová, 2010, p. 19) or similarly codes of business associations, professional associations and individual companies (Seknička, Putnová, 2016, p. 147).

Remišová (2015, p. 153) distinguishes the codes of ethics which focus on principles and values, normative codes, and combined codes.

The code of ethics can be **created** by company management or owners, or it is possible to engage in the process of its creation large number of employees (Zadražilová, 2010, p. 126).

Kacetl (2011, p. 50–52) states that the creation of the code of ethics should be a teamwork of a team that cooperates with company management while company management is responsible for determining business culture and key values and these are a base for individual norms and regulations. The role of key values is also accentuated by Horváthová, Bláha and Čopíková (2016, p. 117) and Remišová (2015).

It is a question what **content** the code should have. The codes should follow the formal law adjustment; in the preambles of these documents there is often stated the commitment to fully respect the current law (Seknička, Putnová, 2016, p. 147) and to the ethical behaviour. The principle of the advancement from the general to the specific should be respected (Rolný, 2014, p. 91).

The most important value in the business activity is responsibility. Commitments to stakeholders are expressed by clear comprehensible principles whose adherence can be evaluated. It can be recommended to use a positive formulation in the first-person plural: “we are responsible...” The code of ethics should be individualized for the company. It can regulate following areas: basic information about the code, where to find help, work environment, the conflicts of interests, gifts, trade, relations to customers, confidential company information, company and local community. The introduction should include the explanation of basic values, the word of general manager, the motives of the codes’ implementation, obligation to announce unethical activities, responsible persons etc. (Kacetl, 2011, p. 50–52). Rolný (2014, p. 93) accentuates positive formulation of text, too.

Specific requirements for the behaviour of ordinary employees and managers should be specified into the form of principles which should have the character of criteria in order to enable behaviour evaluation (Rólný, 2014, p. 91).

The code of ethics should be comprehensible, simple and unambiguous. It should reflect the whole spectrum of company activities. The length of the code is important as a very short one could mark the lack of interest of the company while a too long one could be unintelligible for stakeholders (Kuldová, 2010, p. 109; Seknička, Putnová, 2016, p. 148). It should have an interesting layout including the graphical arrangement (Kunz, 2012, p. 52).

There are two options how the employees can be addressed: a personal one (we, employees...) and an impersonal one (Remišová, 2015, p. 155).

The principles can reflect specific **structure**. Remišová (2015, p. 157) mentions two parts of basic structure: preamble and main text. The interceding of general manager, validity extent and violation procedures, case studies, and the list of main terms can be added to these basic parts.

The document begins with a preamble (Seknička, Putnová, 2016, p. 147) and then it is appropriate to define moral commitments to individual subjects and to express long-term goals and the interests of the company (Rólný, 2014, p. 91). In the code of ethics, the principles of ethical behaviour can be regulated whether they be to the state, in the context of whole society (respecting human rights, philanthropic activities), of relations to shareholders, business partners, customers and employees (equal opportunities, prohibition of discrimination, safe work conditions etc.) (Zdražilová et al., 2010, p. 126). Merhaut (2013, p. 56) describes following areas covered by the codes of ethics: relations to employees, customers, business partners, rival companies, state and society, environment, owners and investors. Similar structure is presented by Seknička and Putnová (2016, p. 147), too, and specify the typical

problem areas of the codes of ethics: respect to law, fairness, safety and production quality, conflict of interests, rejection of discrimination, relations to suppliers, misuse and use of information, corruption, social responsibility, protection of environment and other. Remišová (2015, p. 167) states that the main text of the code can be structured not only by stakeholders but by ethical problems and ethical values, too.

The end part of the code should be an easy and intelligible methodical procedure for moral decision-making processes (Rolný, 2014, p. 91).

It is questionable if the breaking of the code of ethics can be **sanctioned**. Remišová (2015, p. 144) states that the violation of the code must be sanctioned and states two forms of these sanctions: conscience and public opinion.

Merhaut (2013) mentions obligatory and facultative codes whereby the easiest way to make a code of ethics obligatory should be its placement into employment contract.

Zadražilová et al. (2010, p. 128) point out that two main possibilities have to be distinguished. If the code of ethics contains duties derived from law and applied to employees position, it is possible not only to reproach the unethical behaviour but also to sanction the employees for breaking their duties derived from law regulations related to performed work, too. If the code contains duties which have no support in law, it is not possible to sanction their breaking. Their breaking could affect the evaluation of the employee, granting facultative benefits etc. but it could not be sanctioned as breaking of work discipline.

## **2 Methodical procedure**

In the first phase of the research, the corpus of the codes of ethics is build. For the search, the search engine Google.cz is used. The search string is “etický kodex”. The first twenty results are chosen to build the corpus. Only such results are included where the text of the code of ethics in Czech language can be found. The codes of ethics of associations and branches are excluded; the corpus is build only of individual entrepreneur subjects' codes.

In the second phase, selected criteria are evaluated in the corpus. The criteria are built on the basis of theoretical background formulated in the chapter 1. For the purpose of this paper, the following formal criteria are used: number of standard pages, structure, and text style. And further following criteria of content are examined: form of principles, values, observance of law, reporting of code rules breaking, and sanctions.

The end phase of research consists of formulating the key findings about the characteristics and specifics of the codes of ethics in the Czech business environment.

### 3 Research results and discussion

The **formal criteria** were examined first: number of standard pages, structure and text style.

In order to be able to determine the **number of standard pages**, the text of each code was copied in MS Word document. The number of letters (including spaces) was read in the characteristics and divided by 1800. It was not possible to run this procedure for 3 codes of ethics (the document was secured or had graphic, not text character), so the values were calculated on the base of 17 codes.

The average number of standard pages is 8.6. This value is strongly influenced by 3 codes which exceed 15 standard pages (15.4; 27.4 and 39.8), so the median value could be more representative: 4.9. 5 out of the 17 codes (29.4%) are long 4–6 standard pages. The majority of examined codes (64.7%) do not exceed 6 standard pages.

Next criterion is the **structure**.

Almost all examined codes of ethics have an entry part that could be defined as a preamble. Only 1 examined code consists of a set of principles only without this entry part.

Further, the structure of principles presented in the codes is examined. Three possibilities are distinguished: classification by stakeholder groups, by problem areas and as last a simple list of rules without classification.

The most frequent way the rules in the codes are classified is the classification by problem areas which was identified in 12 out of 20 (60%) examined codes of ethics. The other two possibilities have the same representation: 4 codes are divided by stakeholder groups and 4 codes contain simple lists of rules without further classification.

The last formal indicator is **text style**. The personal and impersonal text styles can be distinguished. The code is categorized as personal if the text included such markers as verbs in the first person plural or singular or personal pronouns. Without these text characteristics, the code is categorized as impersonal.

The most codes (65%) are on the basis of text style marked as personal. Mostly the first person plural (*uznáváme a respektujeme...*) was identified but the first person singular (*Co slíbím, to dodržím.*) or personal pronouns (*Naším cílem je...*) are present, too.

Secondly, the **criteria of content** are discussed. The codes of ethics can be distinguished by **form of contained principles**. For the purpose of the research, three possibilities are taken into account. Ideals are understood as more generally formulated principles, rules as more detailed characteristics of professional behaviour and finally instructions as precisely defined

rules with an educative impact on employees (e.g. containing examples from professional life, questions and answers, decision-making diagrams etc.). The authors of this paper are aware that the borders specifying these variants are fuzzy and the categorization depends on the individual decisions of the evaluator. This aspect was minimized by the fact that the decisions on categorization were made by all four authors.

Ideals as form of principles are identified in 7 codes (35%), rules in 10 codes (50%) and instructions in only 3 codes of ethics. This result shows that the examined codes of ethics are a compromise between detailed formulations and briefness.

Further, the contained **values** are discussed. In the examined corpus, 8 out of 20 codes have explicitly formulated values. Values which appear in the different codes more than once are professionalism (3), improving/innovation (2), customer orientation (2), respect/mutual respect (2), team work/spirit (2), intelligibility (2), and responsibility (2). Numbers of occurrences are stated in the brackets.

According to **observance of law**, it can be stated that almost all (85%) examined codes of ethics contain an explicit statement about observance of law. This can be explained by the fact that ethical norms are a superstructure to legal norms although the codes of ethics should concentrate essentially on ethical principles.

In the expert literature, it is discussed how to **report** breaking of the code of ethic rules and how to **sanction** this breaking. Some formulations about a responsible person or another channel for the reporting of the breaking of the rules were found in 8 (40%) codes of ethics. Responsible persons for reporting to are defined as manager, HR and law department or HR manager and lawyer, ethic committee or manager, internal audit manager, compliance worker. In 4 cases hotline or written notice are mentioned.

Half of the codes contain sanctions for breaking the code of ethics. The list of sanctions is presented in the following table.

**Tab. 1: Sanctions for breaking the codes of ethics**

<b>Sanctions for breaking the code of ethics</b>
disciplinary procedures
disciplinary procedures, including immediate termination of employment
corrective measures/disciplinary measures/judicial procedure
corrective measures
disciplinary measures or termination of employment
exclusion from system/compensation of damage
penalty/employment termination
as breaking work law
as breaking work duties
legal and financial consequences

Source: own research on the basis of examined codes of ethics

It can be stated that most sanction formulations in the examined codes of ethics lean on legal measures.

In this place, it is necessary to mention that not many research teams analyse or compare codes of ethics. Almost none of them researched this area from so many points of views. From similar studies, the work of Wood (2000) is worth mentioning which examines the contents of the codes of ethics of 83 of the top 500 companies operating in the private sector in Australia in an attempt to discover whether there are national characteristics that differentiate the codes used by companies operating in Australia from codes used by companies operating in the American and Canadian systems. His major conclusion is that, whilst Australian codes do have some characteristics that differentiate them from the other two groups; it appears that companies in all three cultures are driven by the same motives to develop codes.

Another interesting study (Adams et al., 2001) investigates effects of codes of ethics on perceptions of ethical behavior. Respondents from companies with codes of ethics rated role set members (top management, supervisors, peers, subordinates, self) as more ethical and felt more encouraged and supported in ethical behavior than respondents from companies without codes. Key aspects of the organizational climate, such as supportiveness for ethical behavior, freedom to act ethically, and satisfaction with the outcome of ethical problems were impacted by the presence of a code of ethics. The mere presence of a code of ethics appears to have a positive impact on perceptions of ethical behavior in organizations even when respondents cannot recall specific content of the code.

It is worth mentioning also a long-term study (Singh, 2006) which compares the findings of content analyses of the corporate codes of ethics of Canada's largest corporations in 1992 and 2003. For both years, a modified version of a technique used in several other studies was used to determine and categorize the contents of the codes. It was found, *inter alia*, that, in 2003, as in 1992, more of the codes were concerned with conduct against the firm than with conduct on behalf of the firm. Among the changes from 1992 to 2003 were a significant increase in the frequency of mentioning of environmental affairs, legal responsibility as the basis of codes and enforcement/compliance procedures.

Last but not least, a study in the environment of Czech public and private universities can be mentioned. It showed the fact that the code of ethics is usually a part of internal school instructions; however, the approach of universities to its creation and promoting varies significantly. Some institutions chose a strongly formalistic approach to their code of ethics, other ones were creative and yet some universities did not consider their code of ethics to be a useful document. Especially the first mentioned approach is very frequent therefore it can be deduced that ethical questions are considered as marginal until a medial interesting affair appears and even then, general valid conclusions are not drawn which would have helped to prevent such affairs in future and improve the public image of university environment. (Aeropág, 2011)

## **Conclusion**

The gained results help to show the profile of a typical company Czech code of ethics. It is typically not longer than 6 standard pages and has an entry part that could be understood as a preamble. The code is mostly classified by problem areas and offers personal text style probably for the purpose of effective persuasion.

As form of contained principles the rules are most often used. The majority of the codes do not have explicitly defined values, but almost all of them accentuate the observance of law. The rules in the codes are usually classified by problem areas. About 85% of the examined codes of ethics contain an explicit statement about the observance of law rules; therefore, code of ethics should essentially focus on ethical principles and not define the legislative framework. Only 40% of the examined codes state a responsible person or a functioning channel for reporting. Half of the codes of ethics contain sanctions for breaking the codes.

A basic analysis of structure of the most used codes of ethics in the praxis was carried out in this paper. In the next studies among other things, the authors want to focus on the area

of codes of ethics creation process and correlation of impact of chosen model (Scandinavian or American) on efficiency of adherence to code of ethics. The results gained by this correlation should then help to create methodology for choosing an appropriate model of creation and implementation of code of ethics for a particular organization.

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### Appendix: Codes of ethics used for research

Organization	Code of ethics available at:
AAA AUTO	<a href="http://www.aaaauto.cz/cz/eticky-kodex/text.html?id=84">http://www.aaaauto.cz/cz/eticky-kodex/text.html?id=84</a>
AGROFERT	<a href="https://www.agrofert.cz/o-agrofertu/eticky-kodex-koncernu-agrofert">https://www.agrofert.cz/o-agrofertu/eticky-kodex-koncernu-agrofert</a>
ČESKÁ SPOŘITELNA	<a href="http://www.csas.cz/banka/content/inet/internet/cs/Eticky_kodex.pdf">http://www.csas.cz/banka/content/inet/internet/cs/Eticky_kodex.pdf</a>
DOPRAVNÍ PODNIK OSTRAVA	<a href="http://www.dpo.cz/soubory/spolecnost/eticky-kodex.pdf">http://www.dpo.cz/soubory/spolecnost/eticky-kodex.pdf</a>
DR. MAX LÉKÁRNA	<a href="https://www.drmax.cz/kariera/firemni-kultura/eticky-kodex">https://www.drmax.cz/kariera/firemni-kultura/eticky-kodex</a>
DRFG	<a href="http://www.drfg.cz/wp-content/uploads/2016/02/eticky-kodex-drfg-2016-ver_1-1.pdf">http://www.drfg.cz/wp-content/uploads/2016/02/eticky-kodex-drfg-2016-ver_1-1.pdf</a>
FOXCONN	<a href="http://www.foxconn.cz/uploads/Etick%C3%BD%20kodex/Code%20of%20Ethics_Cz_Version%20B%202.pdf">http://www.foxconn.cz/uploads/Etick%C3%BD%20kodex/Code%20of%20Ethics_Cz_Version%20B%202.pdf</a>
HESTEGO	<a href="http://www.hestego.cz/fileadmin/user_upload/o_spolecnosti/eticky_kodex_2009_2.pdf">http://www.hestego.cz/fileadmin/user_upload/o_spolecnosti/eticky_kodex_2009_2.pdf</a>
M2C	<a href="http://www.m2c.eu/eticky-kodex-1404048950.html">http://www.m2c.eu/eticky-kodex-1404048950.html</a>
METROSTAV	<a href="http://www.skupinametrostav.cz/cz/eticky_kodex">http://www.skupinametrostav.cz/cz/eticky_kodex</a>
MODRÁ PYRAMIDA STAVEBNÍ SPOŘITELNA	<a href="https://www.modrapyramida.cz/sites/files/modrapyramida/attachments/eticky-kodex-01-12-2016_0.pdf">https://www.modrapyramida.cz/sites/files/modrapyramida/attachments/eticky-kodex-01-12-2016_0.pdf</a>
OSTROJ	<a href="http://static.ostroj.s8.upgates.com/x/x533561c882f0f-eticky-kodex.pdf">http://static.ostroj.s8.upgates.com/x/x533561c882f0f-eticky-kodex.pdf</a>
PARTNERS	<a href="http://www.partners.cz/cs/o-partners/eticky-kodex/">http://www.partners.cz/cs/o-partners/eticky-kodex/</a>
PROVIDENT	<a href="https://www.provident.cz/o-nas/eticky-kodex">https://www.provident.cz/o-nas/eticky-kodex</a>
PSJ	<a href="http://www.psj.cz/o-spolecnosti/profil-spolecnosti/eticky-kodex.html">http://www.psj.cz/o-spolecnosti/profil-spolecnosti/eticky-kodex.html</a>
RE/MAX	<a href="http://www.remax-czech.cz/eticky-kodex/">http://www.remax-czech.cz/eticky-kodex/</a>
RZB GROUP	<a href="https://www.rb.cz/attachments/obecne-informace/eticky-kodex.pdf">https://www.rb.cz/attachments/obecne-informace/eticky-kodex.pdf</a>
SANOFI	<a href="http://produkty.sanofi.cz/media/Code_Ethics_CZ.pdf">http://produkty.sanofi.cz/media/Code_Ethics_CZ.pdf</a>
SKANSKA	<a href="http://www.skanska.cz/cdn-1d225658436f2b3/Global/About%20Skanska/Downloads/Code%20of%20Conduct_pdf_CZ.pdf">http://www.skanska.cz/cdn-1d225658436f2b3/Global/About%20Skanska/Downloads/Code%20of%20Conduct_pdf_CZ.pdf</a>
STOB	<a href="http://www.stob.cz/cs/eticky-kodex">http://www.stob.cz/cs/eticky-kodex</a>

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## THE EFFECT OF GENDER, AGE AND EDUCATION ON ENTREPRENEURIAL CURIOSITY

Miha Marič – Ivan Todorović – Mladen Čudanov – Gašper Jordan

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### Abstract

**Purpose:** Entrepreneurial mind-set has been a topic of various research. Entrepreneurial curiosity has been related to some other constructs in entrepreneurial research, whereas the antecedents or the relation to the entrepreneur's demographics has yet not been investigated. We therefore test how gender, age and the level of education affect entrepreneurial curiosity.

**Design/methodology/approach:** Since there is no previous research on which we could build hypotheses, we use three research questions; and explore if there is a difference in entrepreneurial curiosity depending on the gender, and the possible curvilinear relationships among age and entrepreneurial curiosity, and the level of education and entrepreneurial curiosity. Participants in this study were entrepreneurs from Serbia, from which we gathered data through the interviews, by using a survey in which they were questioned about their gender, age, level of education and on the variables composing entrepreneurial curiosity.

**Findings:** The results show a difference in entrepreneurial curiosity based on gender, indicating that entrepreneurial curiosity was greater for women than men. Potential curvilinearity between age and entrepreneurial curiosity and the level of education and entrepreneurial curiosity was not confirmed due to the lack of statistical significance.

**Research/practical implications:** The results of this study give better insights into the basic demographics' effect on entrepreneurial curiosity. The implications are foremost for the policy makers, investors and entrepreneurship researchers, so they can have better insights on whom the entrepreneurially curious ones are. Suggestions for further research are to continue investigating the antecedents of entrepreneurial curiosity and also its consequences.

**Originality/value:** The proposed research has not yet been done, so that this will contribute to entrepreneurship theory and practice.

**Keywords:** entrepreneurship, entrepreneurial curiosity, human resources, HRM

**JEL Codes:** L26, O15

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## **Introduction**

The study of entrepreneurship in international context has been a topic of great significance in the last two decades (Navarro-García, 2016) together with an increased awareness of importance to research different entrepreneurial related constructs (Jeraj, Marič, Todorović, Čudanov & Komazec, 2015). Entrepreneurship is a dynamic process where individuals create incremental wealth, and bear the main risk in terms of providing value to the product or service (Sulistyo, 2016). It is increasing in scope and is applied in form of intrapreneurship in large, even in public companies (Omerbegović-Bijelović, Rakićević & Vučinić, 2016) and is a social phenomenon as well (Thornton, Ribeiro-Soriano & Urbano, 2011). Entrepreneurship is of the utmost importance for having a healthy and wealthy economy (Saiz-Álvarez, Coduras & Cuervo-Arango, 2014).

### **1 Entrepreneurial curiosity**

Entrepreneurial curiosity is defined as a positive emotional/ motivational system oriented toward investigation in the entrepreneurial framework to learn tasks related to entrepreneurship and incorporate new experiences in order to improve business (Jeraj & Antončič, 2013). Entrepreneurial curiosity is an interest in novelties or observations of society and a tendency to search for answers that indicate which demands should be met and it also represents guidance and competitive advantages for entrepreneur's relative to the competition (Jeraj & Marič, 2013). Since this construct deals with different essential elements of entrepreneurship, a relatively high level of entrepreneurial curiosity can represent value added in comparison to the entrepreneurs that have entrepreneurial curiosity on relatively low level (Peljko, Jeraj, Săvoiu & Marič, 2016).

## **2 Methodology**

### **2.1 Research questions**

Based on studied literature and previous research, we propose our three research questions:

*RQ1: Is there a difference in entrepreneurial curiosity based on gender?*

*RQ2: Is there a curvilinear relationship between age and entrepreneurial curiosity?*

*RQ3: Is there a curvilinear relationship between the level of education and entrepreneurial curiosity?*

At the beginning of the next chapter, we present the data gathering process and the sample properties and thereafter continue with the results of current study, which we later on discuss and interpret.

## 2.2 Participants

The full set of questionnaires was completed by a total of 201 participants, founders and owners of micro, small or medium enterprise (MSME) in Serbia, randomly selected from the database of Serbian MSMEs, available at Serbian Business Registers Agency. In our sample 144 (71.6%) were men and 57 (28.4%) were women. According to the educational level of respondents: 4 (2.0%) finished elementary school, 44 (21.9%) received high school diploma, 32 (15.9%) finished college, 17 (8.5%) received associate's degree, 53 (26.4%) received bachelor's degree, 43 (21.4%) received master's degree, 6 (3.0%) received professional degree and 2 (1.0%) received doctoral degree, fitting in overall demographics of the population.

## 2.3 Instruments

*Entrepreneurial Curiosity* was measured with a questionnaire developed by Jeraj (2014). Entrepreneurs had to indicate for each of the statements related to entrepreneurial curiosity how often does a particular activity occur in their life by circling the number of frequency of the occurrence from "1" - the activity never occurs to "7" - it always occurs for first three items and how strongly they personally agree or disagree with the statement (ranging from 1 = 'I strongly disagree' to 7 = 'I strongly agree') for last four items.

## 2.4 Data collection

Empirical research on entrepreneurial curiosity was performed by a survey method. To obtain data, we have designed a questionnaire and directly talked with the owners of MSMEs in Serbia, filling the questionnaire during the process. After conducting research, primary data was controlled and edited. For processing and analysing data, we have used IBM SPSS Statistics 24.

## 3 Results

First, we wanted to answer RQ1, in which we researched if there is a difference in entrepreneurial curiosity based on gender. A Kolmogorov – Smirnov test was used to test for normality and assumption of normality was violated,  $p = .000$ . Average value of entrepreneurial curiosity for man was  $M = 5.13$ , and for woman was  $M = 5.15$ . A Mann-Whitney test indicated that entrepreneurial curiosity was greater for women than for men,  $U = 4079.5$ ,  $p = .095$ .

Before testing the curvilinearity of the relationship between age and entrepreneurial curiosity, linear regression was used to analyse the relationship between them. With age as the predictor, -0.002% variance of entrepreneurial curiosity is explained ( $\beta = .051$ , Sig. = .472); a statistically insignificant effect.

In the second research question, we tested the potential curvilinearity of the relationship between age and entrepreneurial curiosity. For this purpose, the regressions in which the age and its squared value are independent variables, and entrepreneurial curiosity is the dependent variable, have been made (Tab. 1).

**Tab. 1: Testing the potential curvilinearity RQ2**

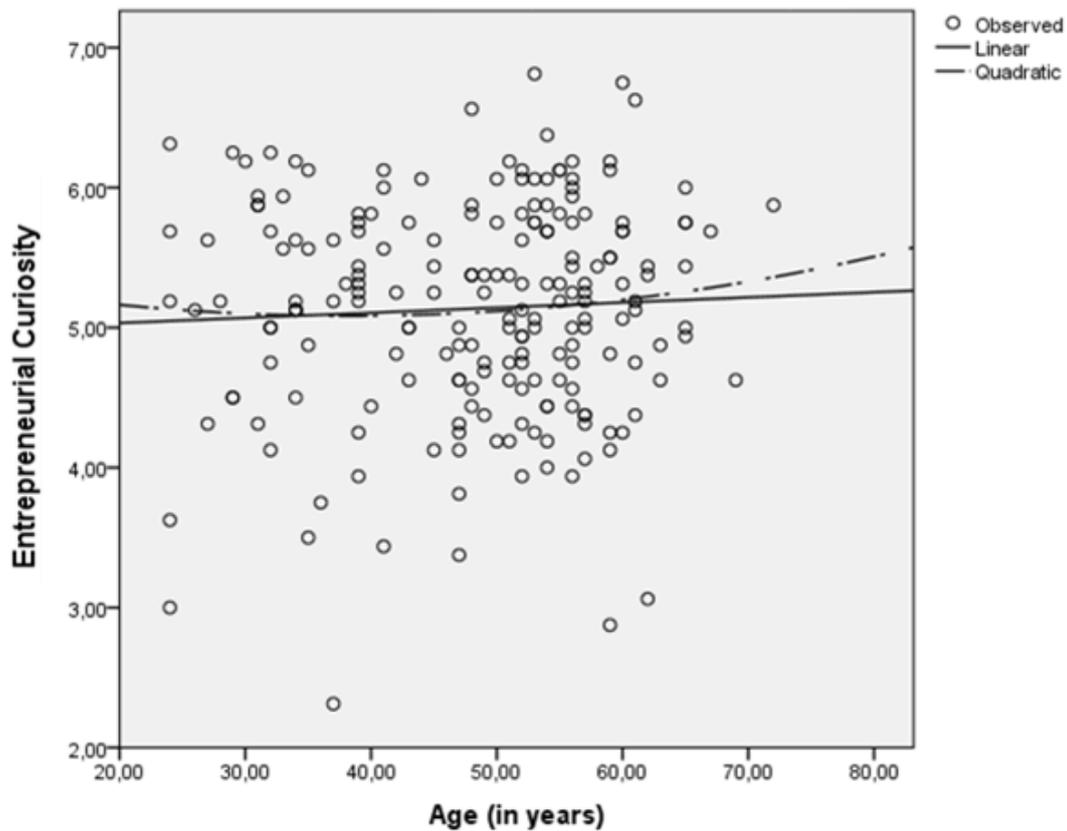
	Entrepreneurial Curiosity
Age	-.256 (.652)
Age <sup>2</sup>	.309 (.585)
Adj. R <sup>2</sup>	.006
F	.408

*\*Presented are standardized coefficients  $\beta$  and statistical significances (Sig.) in brackets.*

Source: Own research.

Fig. 1 presents the linear and squared regression model, which presents the relations between age and entrepreneurial curiosity. It is presented, what happens, when independent variables of age and the squared value of the variable age increase and how it affects the dependent variable of entrepreneurial curiosity. Adjusted R<sup>2</sup> shows that very small portion of variance (0.6%) in our dependent variable is explained by our independent variables. Due to the lack of statistical significance, we cannot confirm nor deny curvilinearity between age and entrepreneurial curiosity.

**Fig. 1: A graphic representation of the curvilinearity test for RQ2**



Source: Own research.

Before testing the curvilinearity of the relationship between the level of education and entrepreneurial curiosity, linear regression was used to analyse the relationship between them. With the level of education as the predictor, 1.7% variance of entrepreneurial curiosity is explained ( $\beta = .149$ , Sig. = .034); a positive effect and also statistically significant.

In the third research question, we test the potential curvilinearity of the relationship between the level of education and entrepreneurial curiosity. For this purpose, the regressions in which the level of education and its squared value are independent variables, and entrepreneurial curiosity is the dependent variable, have been made (Tab. 2). Adjusted  $R^2$  shows that very small portion of variance (1.3%) in our dependent variable is explained by our independent variables. Due to the lack of statistical significance, we cannot confirm nor deny curvilinearity between the level of education and entrepreneurial curiosity.

**Tab. 2: Testing the potential curvilinearity RQ3**

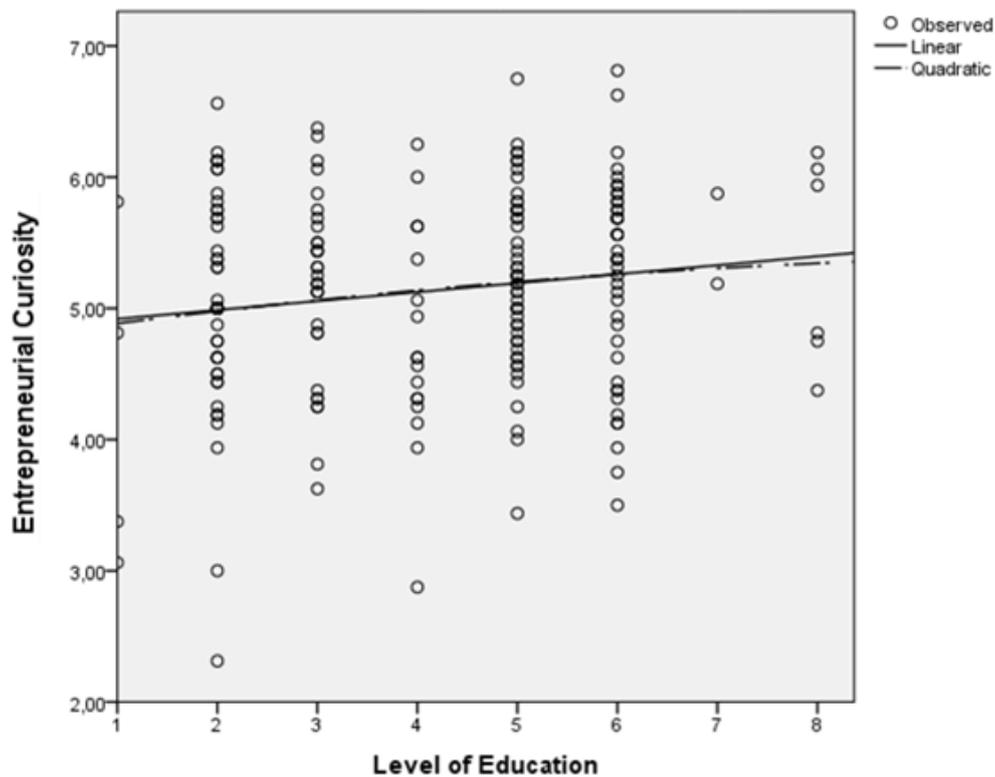
	Entrepreneurial Curiosity
Level of Education	.235 (.503)
Level of Education2	-.087 (.807)
Adj. R2	.013
F	2.295

*\*Presented are standardized coefficients  $\beta$  and statistical significances (Sig.) in brackets.*

Source: Own research.

Fig. 2 presents the linear and quadratic regression model, which presents the relations between the level of education and entrepreneurial curiosity. It is presented, what happens, when independent variables of level of education and the squared value of the variable level of education increase and how it affects the dependent variable of entrepreneurial curiosity.

**Fig. 2: A graphic representation of the curvilinearity test for RQ3**



Source: Own research.

## Conclusion

The most important findings from the field of entrepreneurship research came from economics, psychology and sociology (Frese & Gielnik, 2014). According to the fact that the research on how the demographics affect entrepreneurial curiosity has yet not been previously made, we have decided to use research questions in our research.

We have found a difference in entrepreneurial curiosity based on gender, indicating that entrepreneurial curiosity was greater for women than men. On the other hand, although we expected for the relations among the demographic values and entrepreneurial curiosity to be positive and significant, if not linear, we cannot with statistical significance claim a curvilinear relationship when it comes to the effects of age or the level of education on entrepreneurial curiosity. Famous success of college dropouts in entrepreneurship, (resulting in e.g. Microsoft or Facebook) is in line with our results. Although these separate cases proof may be criticized as survivor biased, our results do show that there is no significant relationship between how high formal education of a person is, and how high entrepreneurial curiosity of that person is. This implicates that the system of education in Serbia does not foster nor grow the curiosity of students. The initiative of changing education paradigms, championed by Sir Kenneth Robinson promises to increase influence of education on curiosity of students. Future research option is to repeat the research with the same construct in different education system context and see if the results differ.

Development of entrepreneurship can present possible model for decreasing unemployment rate (Čudanov, Jaško & Săvoiu, 2012). Based on that knowledge, the same effort should be invested to the scientific research related to this field. Entrepreneurship should be presented not only as an alternative but also mainly as the first choice of professional engagement in order to make it more accessible and rewarding.

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## INTERRELATION BETWEEN CORPORATE SOCIAL RESPONSIBILITY AND COMPANY PERFORMANCE

Maria Markhaichuk

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### Abstract

**Purpose:** The paper is focused on the identification of relation between corporate social responsibility (CSR) and company performance in the Russian Federation. The aim of study is an empirical search for the answer to the question: Are socially responsible activities of the companies linked to their results?

**Design/methodology/approach:** Data on the large Russian companies belonging to different branches were taken as a basis for the research. The sample includes data on the CSR level of fully and partially rated by CSRHub Russian companies for the 2012-2017 years. These data were supplemented by information about the companies' performance from the Moscow Exchange, the RBC Information Systems and the official financial statements of the companies. Panel regressions with fixed effects were employed and econometric models with dependent variables such as Market Capitalization, Net Profit, Revenue, Return on Assets (ROA), and Return on Equity (ROE) were estimated to fulfil research aim.

**Findings:** The regression analysis confirmed the existence of the positive impact of CSR level on the companies' performance. In particular, it showed the existence of positive impact of CSR level on the market capitalization of companies and their revenue. No negative impact of socially oriented activities of companies on companies' performance has been detected.

**Research/practical implications:** The research results can be used by the heads of the companies while formulating CSR policy, by the state bodies in the process of regulating and developing CSR Institute.

**Originality/value:** The study empirically proved the positive impact of CSR level on companies' performance and refuted the assumption that CSR costs do not pay off in economic conditions of Russian Federation.

**Keywords:** CSR, Company performance, Regression analysis

**JEL Codes:** M14, C15

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## **Introduction**

Socially responsible behavior of the company is currently considered to be one of the most necessary conditions for providing its competitiveness and investment attractiveness, rise of the brand value, and consumer, employees, state and society loyalty as a whole. Modern market encourages economic entities, whose activities are aimed not only at making profit, but also at creating social value. Growing companies' activity in the sphere of corporate social responsibility (CSR) allows to think of some positive relationship between the attitude of the company management to social responsibility and the companies performance.

Recent researches prove that CSR can really become the basis for ensuring long-term positive effects of company activity and achieving financial goals (Flammer, 2015; Saeidi et al., 2015). In contrast to these studies, there is evidence of a lack of correlation between the socially responsible activities of companies and their financial results (Crisóstomo, Freire, & Vasconcellos, 2011). It is noted that the presence or absence of the relationship between CSR and company performance can be explained by the company's belonging to a certain industry, its activities in a particular country, its size and other factors, and therefore a number of studies are devoted to the consideration of this issue by country, industry, etc. (Benavides-Velasco, Quintana-García, & Marchante-Lara, 2014; Malik & Nadeem, 2014; Michelon, Boesso & Kumar 2013).

In the Russian Federation CSR is developing rather fast and in accordance with the global trends though this type of activity appeared in Russia not so long ago. Nevertheless, there exist some special features constraining CSR development. They are related to the Russian history and geography, people's mentality, traditions of corporate management, social and political situation in the country. These peculiarities strongly influence the company performance in the field of CSR; interrelation of CSR and the results of the company activities being also under this influence.

Latest publications of Russian scientists on the impact of CSR level on companies' performance suggest that at the moment there is no empirical confirmation of the hypothesis that in the Russian economy, socially responsible activities of companies contribute to improving financial results. To achieve the goal of the research, a study of Russian scientists based on CSRHub data, which did not reveal a positive correlation between CSR and the financial results of companies was taken as a basis (Khovaev & Kozhevnikov, 2016).

## 1 CSR in the Russian Federation

At the moment in the Russian Federation mainly the large national companies and divisions of the international companies are engaged in socially responsible activities. Small and medium business is not sufficiently involved in the life of society. There are often cases when firms work for charity causes with the aim to restore their reputation after having done some damage to the society, environment, etc. There is also prejudice that companies are forced to engage in socially responsible activities, as the state shifts its responsibilities to business. Despite the established views and existing obstacles, together with understanding of the benefits that CSR can bring to enterprises, the principles of social responsibility gradually take root in Russian reality.

Growing interest in the CSR topic resulted in emerging various ratings characterizing socially responsible performance of the companies, in which Russian companies are actively included. One of such ratings is the CSRHub rating. Objective of CSRHub is to provide consistent ratings of CSR performance for as broad a range of companies as possible. The CSR rate assessment according to CSRHub methodology includes the following components (categories): community, employees, environment, governance.

According to CSRHub data the average CSR level of the Russian companies included in the CSRHub rating is 56% at the beginning of 2017. This index is a bit lower than in Europe (58%), but higher than in Asia (53%). The positive dynamics of the CSR level of Russian companies is observed. Compared to 2012, the average CSR rating increased by 11 points (fig.1).

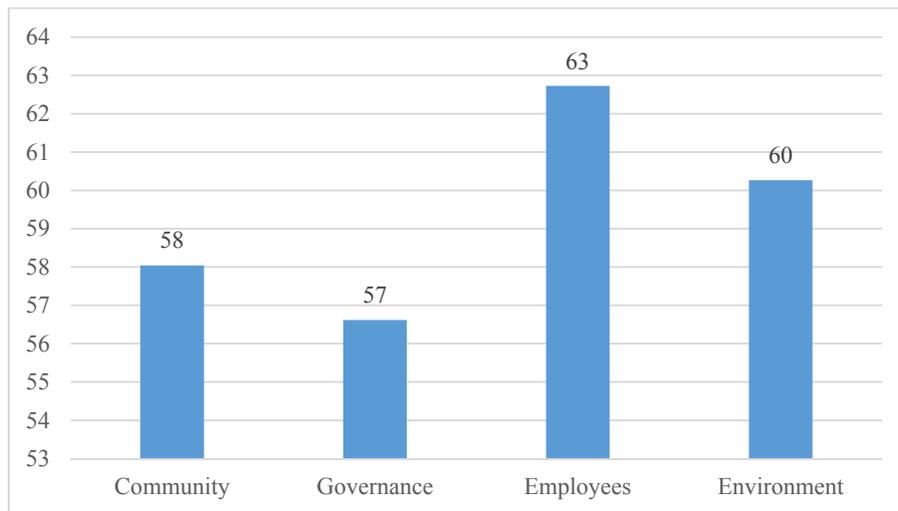
**Fig. 1: Average CSR rate of Russian companies in 2012-2017**



Source: calculated by the author on the basis of CSRHub data

Component analysis of CSR rate (fig.2) shows that in the Russian Federation the highest CSR indices are in the area of dealing with the employees (The Employees category) and the lowest CSR indices are in the field of management (The Governance category). This is the evidence of the need to improve the management of organizational goals, corporate values, accounting the stakeholder's views in decision-making.

**Fig. 2: Average rate of CSR components of Russian companies in 2017**



Source: calculated by the author on the basis of CSRHub data

It is worthwhile to note that 2015 and 2016 are characterized by the unfavorable economic and political situation in the country. That's why in 2015, compared to 2014, the average CSR rate of Russian companies declined.

## **2 Analysis of interrelation between CSR and the Russian companies performance**

Regression analysis was used to investigate the interrelation between CSR level and the Russian companies' performance. The following hypothesis is to be tested:

H0: Higher CSR level is associated with higher companies' performance.

### **2.1 Data**

The study is based on data from various sources for the 2012-2017 years: CSR rate of the Russian companies was taken from CSRHub database; Information about companies' market capitalization was taken from Moscow Exchange web-site;

Indices of Net Profit and Revenue and other data for calculating ROA and ROE were taken from the RBC Information Systems and the official financial statements of the companies.

The database CSRHub at the beginning of 2017 provides information on 120 Russian companies, but the analysis of these data allowed to find out that the overall CSR rate was assigned to only 44 Russian companies. The level of community category (92 companies), employees' category (70 companies), environment category (94 companies) and governance category (94 companies) are partially estimated. For example, in 2012 the overall CSR rate was assigned to 33 companies and the level of governance category was assigned to 44 companies. For the period from 2012 to 2017, 100 companies have some partial estimates. These companies were included into the panel data. These data were supplemented by information about the companies' capitalization from the site of Moscow Exchange, indices of Net Profit and Revenue and other data for calculating ROA and ROE from the RBC Information Systems and the official financial statements of the companies. Collected data were formed into a panel of 100 Russian companies covering period of years 2012-2017.

As it was noted earlier, the specificity of CSR in the Russian Federation is such that in the main, socially responsible activities are carried out by large companies. Thus, the study includes large companies from various industries, such as Aerospace & Defense, Agriculture & Mining, Alternative Energy, Banking, Brokerage & Capital Markets, Chemicals, Plastics & Rubber Products Mfg., Electric & Gas Utilities, Manufacturing, Mining, Oil and Gas Extraction, Telecommunications, Utilities etc.

The dependent variables are Market Capitalization, Net Profit, Revenue, ROA and ROE. The main explanatory variable is CSR overall rate. Community category, Employees category, Environment category and Governance category are also explanatory variables. Descriptive statistics are presented in Table 1 below.

**Tab. 1: Descriptive statistics**

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
Community	50.49843	51.00000	82.00000	16.00000	11.18733	319
CSR overall rating	49.79204	51.00000	70.00000	26.00000	6.893870	226
Employees	53.95971	55.00000	90.00000	16.00000	11.82883	273
Environment	52.45846	52.00000	79.00000	19.00000	10.54688	325
Governance	51.57402	50.00000	85.00000	22.00000	11.25987	331
Market Capitalization	449060.3	138449.0	4240331.	2684.000	748505.2	315
Net Profit	66645.54	20328.00	1342442.	-360437.0	172795.8	307
Revenue	565511.9	255603.0	8110605.	2151.000	1161793.	303
ROA	0.076716	0.068382	3.904277	-0.563083	0.250758	306
ROE	0.335316	0.155696	42.75671	-10.63412	2.924622	302

Source: own elaboration

All variables were tested with Levin, Lin & Chu unit root test for panel data. All variables are stationary at 5% level of statistical significance except ROE. Therefore variable ROE had to be first differenced. Additional testing confirmed its stationarity.

## **2.2 Regression analysis**

Fixed effects estimation approach was chosen as estimation technique, because the panel data consist of companies that do not change over time. Fixed effects models were tested for redundancy of fixed effects. Also fixed effects approach is appropriate according to Hausman test. Estimated econometric models are presented in Table 2.

Firstly, the influence of CSR overall rate on Market Capitalization, Net Profit, Revenue, ROA and ROE of Russian companies was investigated (models 1, 3, 5, 7, 9). Then the influence of Community category, Employees category, Environment category and Governance category on Market Capitalization, Net Profit, Revenue, ROA and ROE was analyzed (models 2, 4, 6, 8, 10). Models 1 and 5 confirm statistically significant positive impact of CRS level on companies performance. Higher CSR level is associated with higher Market Capitalization and Revenue. Model 6 shows statistically significant positive impact of Environment category on Revenue.

Confirmation of the relationship between the CSR level and the market capitalization of companies is understandable and expected. Socially responsible activity of the companies promotes formation of a positive image, increase of investment attractiveness and, as a result, growth of stock prices in the stock market. Also, positive image of the company promotes sales growth, which leads to revenue growth.

The positive relationship between the Environment category and the revenue of the company can testify that the current environmental policy, waste management, resource management, energy use, etc., not only contribute to the task of preserving the environment, but also allows to produce more attractive, eco-friendly products, which leads to revenue growth.

Thereby, there is a positive relationship between CSR and company performance. Coefficients before significant variables are positive. Thus, the hypothesis H0 is confirmed.

**Tab. 2: Model table**

Variable / Model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Dependent variable	Market Capitalization		Net Profit		Revenue		ROA		ROE 1st difference	
CSR Overall Rate	11107.58**		-2191.086		15136.13**		0.001712		0.024712	
	(4617.486)		(1811.074)		(6607.239)		(0.001697)		(0.029379)	
Community		427.3921		340.8959		3737.203		0.003734*		-0.018711
		(5336.172)		(2168.036)		(8040.826)		(0.002110)		(0.040253)
Employees		4751.002		-1764.128		-5424.269		-0.003081		0.022262
		(4573.468)		(1943.354)		(7165.400)		(0.001792)		(0.032752)
Environment		5344.273		1222.754		13930.24**		0.002511		0.003735
		(4034.788)		(1729.694)		(6548.183)		(0.001678)		(0.027477)
Governance		-3713.156		-2868.938		-2987.380		-0.003059		0.016158
		(4440.538)		(1837.418)		(6743.330)		(0.001688)		(0.027026)
Constant	126742.3	240149.9	203670.3**	244863.9***	28620.77	303443.3	-0.021461	0.065568	-1.267103	-1.272464
	(232823.7)	(233057.1)	(90662.13)	(93370.38)	(331051.9)	(340894.9)	(0.084939)	(0.085729)	(1.492824)	(1.558859)
R-squared	0.914767	0.919509	0.715612	0.721362	0.915400	0.917359	0.288539	0.332239	0.037110	0.040857
Adjusted R-squared	0.893182	0.891188	0.653186	0.656183	0.896716	0.898174	0.132365	0.175119	-0.216283	-0.243333
F-statistic	42.37996	32.46740	11.46326	11.06748	48.99226	47.81739	1.847544	2.114557	0.146451	0.143767
Observations	194	220	211	229	210	223	211	228	175	186

Note: Standard Errors are in parentheses \*\*\* stat. significance on 1%, \*\* stat. significance on 5%, \*stat significance on 10%.

Source: own elaboration

## Conclusion

The article is devoted to the analysis of the interrelation between CSR and the Russian companies' performance. Regression analysis confirmed the existence of such an interrelation. In particular, it showed the existence of positive impact of CSR level on the market capitalization of companies and their revenue. For the rest of the indices, no significant impact was found. An important result is that no negative impact of socially oriented activities of companies on their performance has been detected. This suggests that, despite the existing bias that the expenses on CSR can reduce the companies results, the study tells the opposite. Based on the results obtained, the following conclusions can be drawn:

1. CSR in the Russian Federation has not yet become a significant enough factor in the development of companies and the achievement of their strategic goals. Further institutional changes are needed that will allow CSR to become not only an article of compulsory spending by Russian companies, but also a stimulator of generating increasing incomes.

2. The weak relationship between CSR and net profit, ROA and ROE is related to the style of management at Russian enterprises. It is necessary to improve the management of organizational goals, company values, and interaction with stakeholders in decision-making.

3. Management of Russian enterprises must clearly understand how to influence the activities effectiveness through socially responsible behavior. There should be connection between business objectives and CSR activities.

4. It is necessary to inform the consumers, employees, customers and partners of the company about the implemented CSR directions.

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## STARTUPS ROLE IN NATIONAL INDUSTRY 4.0 IMPLEMENTATION

Felipe Martinez - Ivana Svobodova – Miroslav Lorenc

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### Abstract

**Purpose:** The research explores the current strategic role of startups in the industry 4.0 (i4.0) implementation at national level. The paper aims to determine the representativeness of startups in governmental strategies for i4.0 implementation.

**Design/methodology/approach:** The research reviews strategic governmental documents dedicated to i4.0 implementation. It identifies keywords to determine the startup concept appearance frequency within these documents. The data analysis provides information to argue the governmental strategic importance of startups for i4.0 implementation.

**Findings:** The paper provides insights about the importance of startups within the governmental strategy for i4.0 implementation. The government supports the general development of startups. However, the i4.0 strategic documents lack to contain startups role.

**Research/practical implications:** The paper indicates the importance of startups inclusion in formal strategic government documentation. The paper is reference for future researches at V4 countries and Germany.

**Originality/value:** Startups are important element in the i4.0 development. This paper contributes to identify the formal inclusion of the element in the government strategies.

**Keywords:** Startup, Industry 4.0, Government, encouragement, subsidy

**JEL Codes:** M13, O38

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## **Introduction**

The term fourth industrial revolution appears in the business lexicon at the 2013 Hanover Fair (Sommer, 2015). Since then, companies, institutions, governments and other organisations search theories, methods or examples that allow them to successfully introduce and implement new technologies. The government of the Czech Republic also develops strategies to introduce and implement i4.0.

Startups are an important element for economic growth (Dennis, 2016; Wennekers & Thurik, 1999) and jobs creation (Henrekson & Johansson, 2010). The Czech business innovation environment includes startups in their agenda. Public and private institutions devote support for their development. The Business and Investment Development Agency - CzechInvest - supports startups development with projects such as CzechStarter or CzechAccelerator. The National Innovation Fund focuses on direct cooperative investments to ensure financial resources at early business stages and proof-of-concept. The fund is a co-founder of Inostart programme. This programme is exclusive for startups financial support. The Operational Programme Entrepreneurship and Innovation for Competitiveness (OPPIK) supports the establishment of new companies and their business. However, the majority of public sector support concentrates efforts on the acquisition of additional financial resources for the startups but it lacks system support to develop the organisation in other aspects.

However, it seems like the conversation about i4.0 excludes entrepreneurship. The implementation of i4.0 involves innovation. Startups are organisations highly related to innovation. The government has several strategic documents for i4.0 development and it also supports the development of startups. However, do strategic documents to develop i4.0 include or consider startups as part of the strategy to the development of i4.0 in the Czech Republic? This research explores the current strategic role of startups in i4.0 implementation at national level. The paper aims to determine the representativeness of startups in i4.0 governmental strategies. The results of this research argue the current importance of the startups in the i4.0 development strategy of the Czech Republic. The discussion about organisational forms is beyond the scope of this paper. The paper reviews the inclusion of entrepreneurship in the governmental strategies on i4.0 and related topics. Startups, spinoffs and SMEs are keywords highly related with entrepreneurship. Spinoff is the usual format that large corporations use for entrepreneurship.

## **1 Industry 4.0, Czech Startups and National Agenda**

The current technological development provides businesses with new tools to approach customers but also to develop their own processes throughout the entire supply chain. This new phenomenon comprises several concepts. The Internet of Things (IoT) includes the continuous exchange of data within the organisation, with suppliers, with customers and other stakeholders but mainly the connectivity between devices and humans (Islam, Kwak, Kabir, Hossain, & Kwak, 2015). Businesses around the world based their operations in this connectivity. The annual volume of this business is about \$11 trillion by 2025 and the applications in industry are the 70% of it (Manyika, et al., 2015). The industry specific obtains the term of Industrial IoT (IIoT) or Industry 4.0. Moreover, it is the German government that emphasis i4.0 as the concept that summarises all benefits of this new revolution (Lasi, Fettke, Kemper, Feld, & Hoffmann, 2014). The historical perspective of the concept recaps that the first industrial revolution is related with the implementation of steam machine in industrial operations. Then, the second revolution introduces electricity to these operations. The era of third industrial revolution includes electronics, which comprises also computers and ICT. However, the current revolution, i4.0, implements Cyber-physical systems, Industrial Wireless Systems, Cloud Manufacturing, Machine to Machine Learning, Virtual/Augmented Reality, Collaborative Robotics and other several current technologies that focus their development on industrial purposes. The concept of Smart Factory summarises the combination of these technologies (Fengque PEI, Yifei TONG, Fei HE, & Dongbo LI, 2017). The development of these new technologies involves high level of uncertainty and business risks. Therefore, it requires different entrepreneurship approaches, such as spinoffs (Chesbrough, 2007). Startups also provide an excellent platform for this development (Wei, 2017).

There are several definitions available of the startup concept. First of all, there is a lack of consensus among experts on its spelling: Startup or start-up. Three criteria define a startup (Luger & Koo, 2005): New, active and independent. The criterion “New” refers to a rapidly growing business or high-impact firms. Bos & Stam (2014) argue that high-impact firms’ growth influences the subsequent growth of the entire industry. Additionally, these organisations are in all business fields (Henrekson & Johansson, 2010).

Several countries around the world confirm the importance of startups for their economies. The strategic alliances at the Canadian biotechnology sector enhance startups’ performance and the industry (Baum, Calabrese, & Silverman, 2000). Knowledge spillovers and innovation activities influence the firm performance in Balkans countries (Ramadani,

Abazi-Alili, Dana, Rexhepi, & Ibraimi, 2017). The incubator, technology, and innovation centres in Switzerland support the development of several firms and they tackle unemployment (Thierstein & Wilhelm, 2001).

The exact number of startups in the Czech Republic is undetermined. The organisations that could be considered startups rapidly emerge and disappear. The definition of startup lacks of uniformity. The companies themselves determine whether they are startups. However, there are some researches that partially try to consolidate some knowledge. The research from Aspen Institute Prague “Czech startups in 2016” concludes that the Czech startups are software companies rather than technology companies (Staszkievicz & Havlíková, 2016). The survey approaches 550 startups but just 125 complete it. Almost 70% of respondents are in the initial stage of pre-seed and seed-stage. Startups at the stage of scale-up or successful entry to the market are 15% of respondents. Only 20% of respondents were able to generate stable and sufficient income during the first year of business. Half of the respondents have no income. The majority starts the business five years previous to the research. These findings argue initiatives to support Czech startups in the early stages. This research shows interesting findings in terms of the extent of innovation. It indicates that 62.1% of respondents engage with an offer of new products or services and 22.7% make effort to improve their current offer. The remaining respondents adapt or copy their offer or they did not provide an answer. The following table shows a selection of sectors for these startups.

**Tab. 1: Startup sectors (selection)**

SaaS	27,7%	Electronics/Robotics	7,1%
Web services	21,3%	Virtual/augmented reality	7,1%
Mobile software services	17%	Advanced manufacturing technologies	5%
Analytics/business intelligence	15,6%	Biotechnology	4,3%
Cloud services	12,1%	Nanotechnology	2,8%
Big data	11,3%	Semantic Web / Artificial Intelligence	2,8%
Internet of Things (IoT)	9,2%		

Source: (Staszkievicz & Havlíková, 2016)

These findings illustrate that Czech startups tend to offer new IT products and services and they have less interest in new technological solutions. However, 34.7% of respondents registered a trademark or patent. This indicates a certain level of innovation. Czech startups lag behind the global advanced startup scene. The real engine of innovation is at the fields of health, biotechnology, advanced manufacturing, robotics, IoT or transportation. The introduction of these innovations is more difficult. It increases the level of responsibility of owners and it reduces the chances of rapid growth and even survival (Hyytinen, Pajarinen, & Rouvinen, 2015). After all, the fourth industrial revolution challenges the current startup scene but it also creates opportunities to enhance it.

## **2 Methodology**

This research explores the current strategic role of startups in i4.0 implementation at national level. It discusses to the available strategic documentation. Therefore, the specific research question for this paper is: Do strategic documents to develop i4.0 include or consider startups as part of the strategy to the development of i4.0 in Czech Republic? The research reviews the strategic documents from the database of Strategic Documents of the Czech Republic (<https://www.databaze-strategie.cz>) administered by the Ministry for Regional Development. The research only includes documents related to entrepreneurship, small and medium enterprises, industry digitisation and similar topics. An intensive systematic search of keywords within these documents determines the inclusion rate of startups in the national strategy. The documents are strategic documents of the Czech Republic with the aim of i4.0 implementation or related topics. The research includes the most recent relevant documents up to March 2017 published by the government, government agencies or other national institutions.

The selected documents include explicit i4.0 documents but also documents with related topics in order to encompass the entire government strategic written expressions on the topic. This includes three documents with specific focus on i4.0. Five of them focus on digitalisation. There are four documents related to innovation. There is one document about competitiveness and the last one contains the national programme of governmental reforms. These documents encompass the current government strategy on i4.0, digitalisation and innovation.

The research determines keywords that allow the identification of the startup concept within the documents. The keywords include similar spelling words such as startup and start-up or spinoff and spin-off. Furthermore, the list of keywords contains startup concept related

words such as Business model, entrepreneurship, new company, small and medium enterprises, SME, among others complement the list of keywords.

All documents are written in Czech language. Therefore, the list of keywords comprises semantics, orthography and declination of the words to include any occurrence of the specific keyword within the text. For example: SME and SMEs; new firm and new company; entrepreneur and entrepreneurship. The list of keywords in Czech language includes 23 words with their possible declinations, norms and roots. The methodology ensures the keyword search even in the files with edition protection.

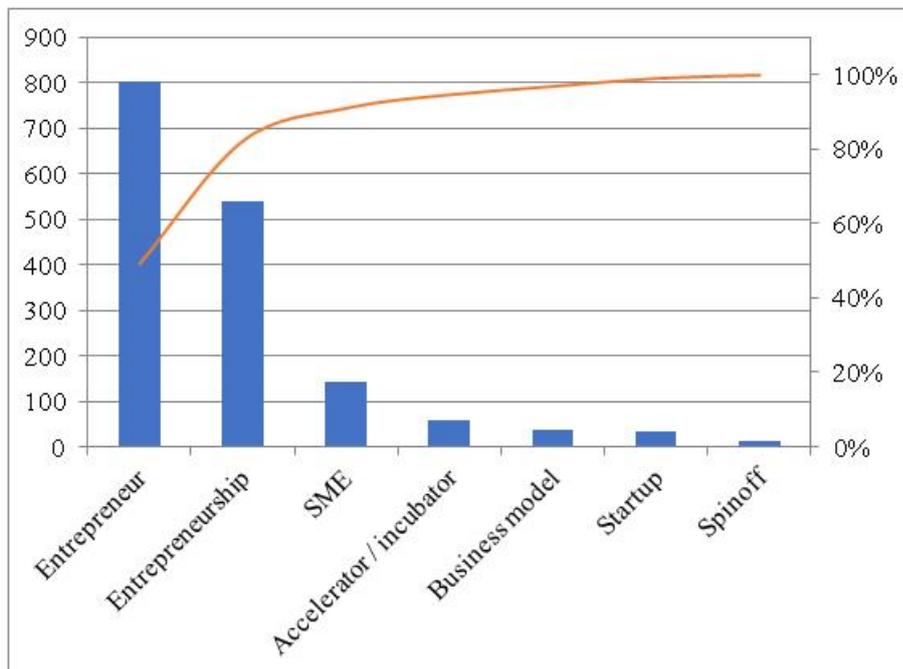
The research seeks for all keywords within the text of each document. The keyword count determines the occurrence of startup related concepts in each document. A list of keywords in English language summarises categories of the original list of keywords in Czech language. This facilitates a better interpretation of the data for this publication. This data allows the creation of a Pareto analysis. This provides information about the highest startup concept occurrence within the documents.

Furthermore, keyword density is calculated as the percentage of the specific keyword in the document. Additionally, keywords categories in English language at each document illustrate the occurrence of these different keywords. The combination of this information identifies the document with the highest appearance of startup related concepts. Additionally, the research reviews these keywords in relation with the context and content of specific documents. This means that the research includes both the meaning and the content of the words.

### **3 Findings**

There are 14 documents relevant for this research. They comprise 39,784 words within 1,574 pages of text. The research identifies 1,663 keywords within them. The keywords “startup” and “start-up” count 36 times. The keyword spin-off counts 14 times. The word “spinoff” has no occurrence. The top keywords are “entrepreneur” with 803, and “entrepreneurship” with 541. There are 6 proposed keywords absent among these documents. These belong to the category of new company and technology firms.

**Fig. 1: Keywords analysis**



Source: own findings

The keywords startup or start-up have higher occurrence in the documents “Action plan for the development of the digital market” (6.8%) and the update of the same document (6.5%). The document “The impacts of digitisation on the labour market in the Czech Republic and the EU” contains just one occurrence of the keyword (“entrepreneur”) and it has the lowest keyword density. The document “National Innovation Strategy of the Czech Republic” contains 50 pages and a keyword density of 1,6%. There are 12 keywords categories. The document “Industry 4.0 Initiative” aggregates 11 of them. The document “The impacts of digitisation on the labour market in the Czech Republic and the EU” has the lowest keyword density and it possesses just one keyword category.

**Tab. 2: Strategic documents on i4.0 (selection)**

Title Translation	Author	Publication Date	Pages	Words	Words/page	Keywords	Keywords density	Keywords Category
National Innovation Strategy of the CR	Ministry of Industry and Trade	2011	40	15,307	383	244	1.6%	9
National Innovation Strategy of the CR - Annex - analytical materials	Ministry of Industry and Trade	2011	99	34,682	350	444	1.3%	7
National policy of research, development and innovation of the CR 2016-2020	Office of the Government of the Czech Republic	2015	127	35,711	281	461	1.3%	8
The National Reform Program of the Czech Republic in 2016	Office of the Government of the Czech Republic	2016	55	22,127	402	268	1.2%	7
Digital Education Strategy 2020	Ministry of education youth and sports	2014	50	17,868	357	203	1.1%	5
Czech International Competitiveness Strategy 2012-2020	Ministry of Industry and Trade	2011	391	126,739	324	1407	1.1%	8
National research and innovation strategy for smart specialisation CR (National RIS3 strategy)	Ministry of education youth and sports	2010	170	68,463	403	696	1.0%	10
Action plan for the development of the digital market (October 2016)	Office of the Government of the Czech Republic	2016	59	19,594	332	176	0.9%	9
Action plan for the development of the digital market	Office of the Government of the Czech Republic	2015	32	10303	322	92	0.9%	9
Industry 4.0 Initiative	Ministry of Industry and Trade	2016	233	89172	383	599	0.7%	11
Czech Digital v. 2.0: The path to the digital economy	Ministry of Industry and Trade	2013	67	21916	327	124	0.6%	8
National Initiative Industry 4.0	Ministry of Industry and Trade	2015	41	10717	261	60	0.6%	7
National Initiative Industry 4.0	Confederation of Employers' and Entrepreneurs' Associations of the CR	2016	190	81407	428	173	0.2%	9
The impacts of digitisation on the labour market in the Czech Republic and the EU	Office of the Government of the Czech Republic	2015	20	5665	283	1	0.0%	1

Source: Authors

## Discussion

The interest of this research is the inclusion of startup concept in the strategic documents at the national level. The analysis of keywords at 14 different strategic i4.0 implementation documents provides insights to understand this inclusion. The total documents keyword density is 4.2%. The keywords with the highest occurrence are entrepreneur, entrepreneurship and SME. The documents Czech International Competitiveness Strategy 2012-2020 and National research and innovation strategy for smart specialization Czech Republic (National RIS3 strategy) contain the highest occurrence of these keywords. These documents include the

keywords to designate entities (similar as the word citizen), which are part of the entrepreneurs and business environment. The documents lack inclusion of the entrepreneurs and businesses.

The document accounting the third place in the list focuses on innovative entrepreneurship. The aim is to support the creation and growth of new businesses, especially in science-based fields. Other goals are to promote cooperation between companies, internationalisation, cooperation with public institutions, the expansion of financial instruments and investment incentives. A particular focus on startups is absent in the document.

Other documents with the highest occurrence of the keyword “startup” are partially focusing on the support of innovative digital projects. However, the high incidence of keywords describes the current situation and the support of CzechInvest.

## **Conclusion**

The keywords occurrence in the text describes the documents. The support to develop startups in the framework of i4.0 development is marginal or it has general overviews without specifics. Other concepts such as entrepreneurship, spinoffs or SMEs are also minor. Therefore, this research illustrates the lack of inclusion of the startup concepts in formal strategic government documentation. The marginal inclusion of the concept misses the opportunity to develop a robust implementation of the i4.0 initiative.

This paper focuses on the strategic i4.0 implementation documents of the Czech Republic. Further research should compare these findings with similar governmental documents in other countries, such Germany or the Central European region.

## **Acknowledgment**

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## **SOUTH MORAVIAN SME'S PERFORMANCE IN RELATION TO MATURITY OF LEADERSHIP: RESULTS OF A QUANTITATIVE RESEARCH STUDY**

**Lukáš Mazánek – Jan Pekárek – Josef Veselý**

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### **Abstract**

**Purpose:** The paper aims to clarify the ability of South Moravian SME managers to perform leadership skills. SME's need to know how to influence affective organizational commitment, defined as a voluntary attachment to the organization, using methods that are cost effective. Application of adequate leadership practice is one of the major factors of success in small and medium-sized enterprises in the UK and Europe. Lack of leadership is cited as a cause of failure in companies and risk to the national and regional economy as well.

**Design/methodology/approach:** We surveyed 112 manufacturing companies to obtain 77 questionnaire responds from South Moravian small manufacturing companies' CEOs and filtered the total of 48 valid SME's respondents. The total of 22 questions, mapped 4 groups of interest in the field of setting vision, enthusiasm, motivation, trust, talent, creativity and knowledge level perception of company CEO. Every question was rated from 1 – 5, when as higher value than higher perception of leadership was assumed. Questions were voluntarily possible to add with a short note explaining the value.

**Findings:** It was found, that there are two major clusters of companies. These with low to average leadership performance (with *L* approximately 70% of less) and these with high performance (with *L* more than 70%). Minimal performance was 9.1%, maximal performance was 98,2%. Only 6 of selected companies performed more than 80%. Nevertheless 5 of them showing low score (>3) in the same subquestion focused at whether leaders inspire others to dreaming about "what if".

**Research/practical implications:** Seven best-performing companies are very strong in evaluated leadership facets. In the future research pursue then explanation of the factors, which differs identified two clusters of companies, what differs those average from the best. We are going to conduct in depth interviews with CEO's of these best performing companies, and we expect, that the results will lead to better understanding how to enhance level of leadership perception. Concurrently applicable advices will be formulated, to enhance companies, having average leadership performance.

**Originality/value:** This paper fulfils an identified need to understand current leadership performance in South Moravian SME's. Leadership perception was analysed and described in 4 groups of interest (vision, enthusiasm, motivation and talent).

**Keywords:** SME's, talent, creativity, motivation, vision

**JEL Codes:** M12, L25

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## **Introduction**

Small and medium-sized enterprises (SME's), defined as organizations with less than 250 employees (European Commission, 2012; OECD, 2014), have become an increasingly important component of policy, both at the national and European level, in recent years (Unger and Heitzmann, 2003; Devins and Johnson, 2003). Indeed, SME's were recently described as "the most important segment of our economy" by the European Commission (Commission of the European Communities, 2008, p. 2)

Large organizations can usually offer better payment and more promising career prospects (Cardon and Stevens, 2004; Harney and Dundon, 2006; Nadin and Cassell, 2007). While the flexibility associated with size is often promoted, relatively little is known about working patterns within SME's (Sieglén et al., 2001; Tsai et al., 2007)

According Kotey and Slade (2005) because SMEs organize their human resources differently, often informally, the process of managing SME's differs from managing people in large organizations.

SME's have less ability to retain employees than their larger competitors. They need to know how they can influence affective organizational commitment, defined as a voluntary attachment to the organization, using methods that are cost effective (Mesu et al., 2015). Application of adequate leadership practice could be useful, according to Soriano and Martínez (2007), effective leadership is one of the major factors of success in small and medium-sized enterprises in the UK and Europe. Lack of leadership is cited as a cause of failure in firms and a risk to the national and regional economy (Thomas et al., 2016) as well. Therefore the aim of our pilot research is to identify the ability of South Moravian SME's managers perform leadership skills.

## **1 Data**

There was conducted the quantitative research among 112 manufacturing companies. The sample was randomly selected on the basis of willingness of CEOs to cooperate voluntarily with researchers, and its layout copies the representation of SME enterprises in the basic set of all SMEs in South Moravia. The sample selection was focused at the manufacturing sector in South Moravian companies.

During the three-months phase in 2016 (9/2016 – 12/2016) we asked 77 South Moravian manufacturing companies' CEOs and filtered the total of 48 valid respondents. Filtered parameters were:

- Is the company in category of SME?
- Is majority of questions (70%) answered? (If more than 30% of answers were blank, the questionnaire was filtered out.)

The total of 22 questions, mapped 4 groups of interest, which are depicted in table 1.

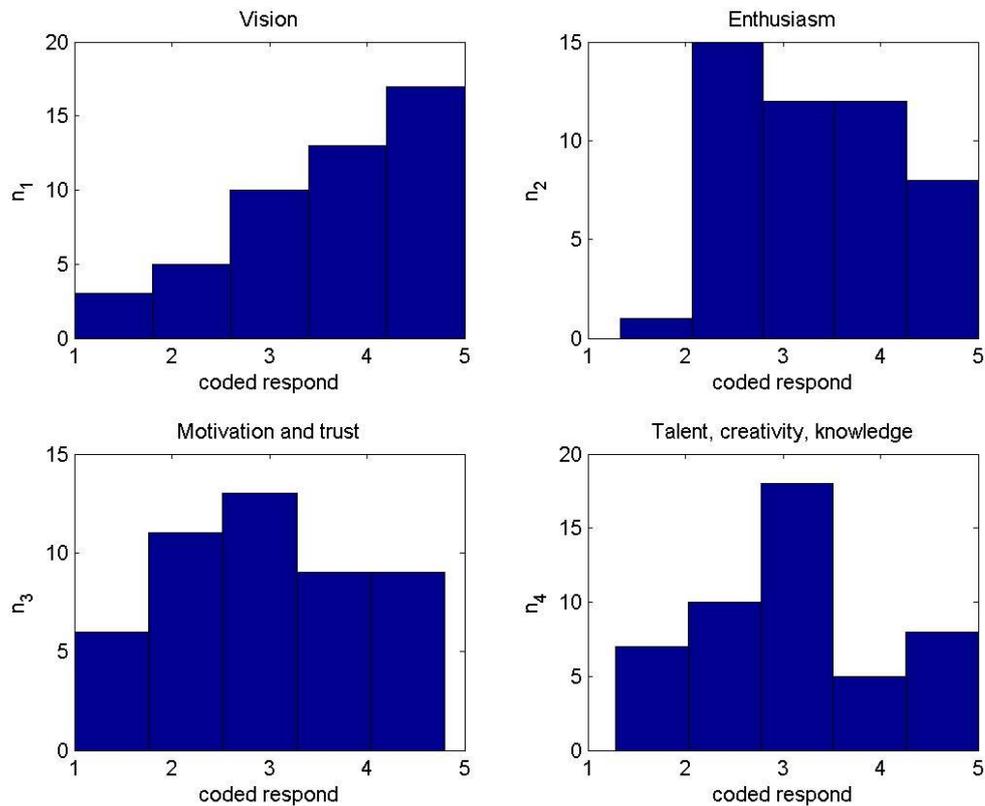
Each question could be answered on a scale from 1 to 5, where the respondents chose if each of 22 presented statements were completely true if the answer was 5 and completely false if the answer was 1. The values in between mean the statement is partially true. As truer the answer was, than the level of perceived leadership ability was stronger.

**Tab 1: Structure of researched fields**

Topic ID	Topic name	Number of questions
<b>1</b>	<b>Evaluation of leadership level in the company</b>	22
1.1	Vision	4
1.2	Enthusiasm	6
1.3	Motivation and trust	5
1.4	Talent, creativity, knowledge	7

Source: Own work, based on collected data

For each of the 4 groups an index was calculated as a mean of the values. Figure 1 shows individual histograms of the indexes for all selected companies.

**Fig.1: Individual histograms of the indexes**


Source: Own work, based on collected data

### 1.1 Interpretation of results in the field of vision

In general our respondents commented the approach they apply.

Here we see those comments of CEO's explaining why they perceive the evaluation in the field of vision as high level:

*"In our company, vision is understand as the key factor of existence."*

*"Our long-term goals and quality policy are posted in the production and non-production parts of the company and they are evaluated as well."*

As an important part of the vision our respondents mentioned the need of adequate internal as well external communication of the key thoughts and principles.

*"Vision is communicated at the extraordinary meeting"*

*"Company values are communicated through internet (company web sites) and notice-boards"*

*"We try to communicate especially our priorities whenever it is possible"*

## 1.2 Interpretation of results in the field of enthusiasm

When researching the level of enthusiasm in South Moravian SME's we were witness to three different points of view at this topic:

Perception from the angle of view that leaders are enthusiastic in their work.

Both of those comments are in line with positive understanding of company mission, which is usually understood as a basic leadership tool:

*"Leaders in our company are living through their work, they have found in it."*

*"Leaders have a very positive relationship with the company production (herbs and a healthy lifestyle)."*

Compilation of the highest evaluated opinions that leaders are spreading enthusiasm among others involves:

*"Leaders are trying to maintain a good atmosphere and encourage workers."*

*"Leaders act inspirative and are perceived as distinguished persons in our company."*

*"The company is founded on the family approach among workers, which enhance the enthusiasm."*

Those were really encouraging perceptions of actual enthusiasm level related to leadership skills.

When we were trying to get deeper and understand whether communication has ability as empower enthusiasm in researched companies we obtained those answers:

*"Every week there is dialog between management and the workers."*

*"Leaders requires a certain participation of workers in the management, but leaders have the final word."*

*"Leaders organize joint discussions on the proposals or solutions to problems encountered"*

## 1.3 Interpretation of results in the field of motivation and trust

Leaders contribute significantly to employee motivation and satisfaction – especially through adequate effective communication, empathy, personal engagement, small talk and informal corporate events, were among the most mentioned. *"They are trying to demonstrate that their work is important for the company and has a sense."*

When discussing the level of trust our respondents mostly agree that it is essential in small company and that everyone have to create conditions for confidential environment. Other words individual or a small group of people can easily disrupt this environment.

One of our respondent with high score mentioned that “leaders are leading by example (they always trust everyone)”

When discussing factors enhancing level of trust in a company there were mentioned as positive “family approach” and informal relationships among workers. *“Because we are rather a family company, is the effort as well on the side of workers to collectively participate in the prosperity of the company”*

#### **1.4 Interpretation of results in the field of talent, creativity and knowledge of employees**

The most of comments are in line with low and average evaluation of creativity related questions

Many times, there are mentioned responses in the meaning of: *“In our company there are only a little possibilities for creative work”*

*“The exact work procedure is designed, creativity is left to the designer or architect who strives to meet customers' wishes.”*

*“Every procedure has a fixed order and there is hardly invent something new. Even in the administrative the scope of work is rather stereotypical.”*

Interesting answer, we received from some of our respondent in the engineering industry. When he was considering statement “Leaders are able to inspire their teams and encourage creativity and innovation,” he said:

*“Nothing like that is happening in the company, it's hard to be applied to the engineering industry, but if anything from that takes place, it's very special.”*

*“As a turnkey production company, which in most cases is a routine work (except the constructors etc.) has no room for creativity.”*

Leadership and its impact on innovations was explored in the field of process and product innovations,

*“Our way is improving the tools, use of new materials, etc. improvement over time (empirically), consultation with customers etc.”*

*“Improving product is the main objective for our leaders, they try to reach it by listening to their customers and employees.”*

*“We strive for continuous improvement based on new experiences and unusual situations.”*

*“Leaders Themselves are not only managers, but also product developers.”*

*“In our company leaders understand that quality process is a major competitive advantage.”*

*“We strive for better communication, ease of production, reorganization of the production halls, new procedures etc.”*

As we see perception of the level of innovations and its relations to leadership. There is possible to see repeated pattern, which enhances leadership in more than this question and it consists of leaders’ product/process engagement and effective communication across the company.

Talent management was perceived as highly important for our respondents:

*“In our company is a strong emphasis on working with talents to discover, develop and support talented individuals.”*

*“I think that it is very important. Leaders should look for more new and young talents”*

*“We offer the practice for high school graduates, efforts to educate employees for future cooperation and in fact to grow our co-workers from the beginning.”*

## **Conclusion**

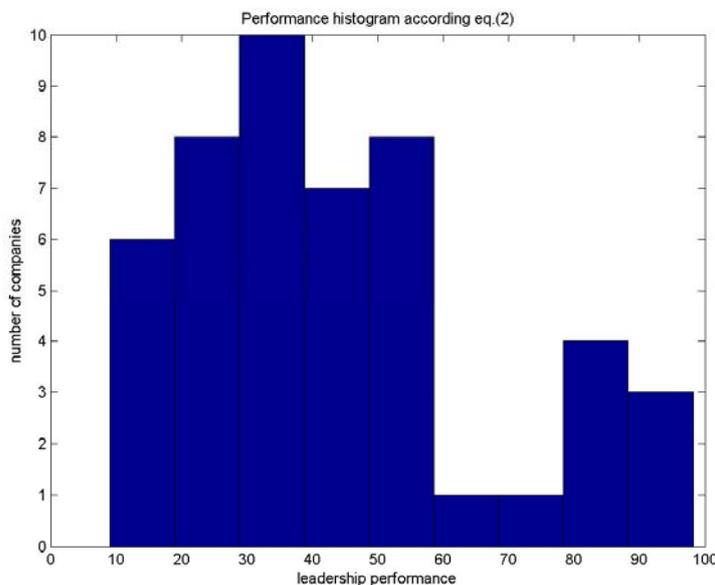
Considering overall performance in leadership of each company, it is possible to represent it as a radar chart, where each axis of the chart depicts the corresponding company’s answer, or alternatively, where each axis corresponds to an aggregated value in each group. In the first case the chart would have 22 axes, in the second case 4. Nevertheless, since the chart would have been used to compare the companies using the comparison of the total area of the chart, it is possible to think of it only as a number, i.e. a metric computed from the company’s answers. This metric can have arbitral form, but the basic one can be simple summation (1), which can provide a basic idea of the differences between companies. Alternatively, an intuitive interpretation of radial charts is comparison of their area after all, hence the more precise metric will be probably (2) as this is the exact area of resulting shape. For both cases  $n$  is number of answers (number of axes),  $a_i$  is an individual answer and  $L$  is percentage of leadership performance of the company. Note that  $L$  is calculated as a percentage of maximal possible leadership performance (all values are 5) in contrast to maximal real performance (which could be the highest performance in the dataset).

$$L = 100 \frac{\sum_{i=1}^n a_i}{5n} \quad (1)$$

$$L = 100 \frac{\sum_{i=1}^n a_i a_{i+1} \sin \frac{2\pi}{n}}{5^2 n \sin \frac{2\pi}{n}}; a_{i+1} = a_1 \quad (2)$$

Only 6 of selected companies performed more than 80%, when using metric (2) and number of statements  $n = 22$ . Minimal performance was 9.1%, maximal performance was 98,2%. Performance histogram for all companies is in figure 2.

**Fig. 2: Histogram of leadership performance for all companies**



Source: Own work, based on collected data

It is possible to conclude, that there are two major clusters of companies. These with low to average leadership performance (with  $L$  approximately 70% of less) and these with high performance (with  $L$  more than 70%).

Looking at the seven best-performing companies' profiles and their answers, we can conclude, that those companies are very strong in all of our evaluated leadership facets. Nevertheless 5 of them showing low score ( $>3$ ) in the same subquestion. This question is focused at talent, creativity, knowledge, and the subquestion discuss, whether leaders inspire others to dreaming about "what would be if..." In short qualitative answers respondents usually mentioned, that "this dreaming is not in competence of subordinates", that "they should focus on what is there, right here and right now instead of what could be if something happens". As well one of the answer has been "they focus at real and achievable tasks" Only the best

performing company of all argue that “*Dreams of individuals are take into the account through the individual motivating program*”.

In this pilot study we were analyzing the current leadership level in Southmoravian SME's. In our future research we see the right direction in explanation of the factors which differs identified two clusters of companies, what differs those average from the best. We are going to conduct in depth interviews with CEO's of these best performing companies, and we expect that the results will lead to better understanding how to enhance level of leadership perception and evaluation. Concurrently we could formulate applicable advices, which will help these companies, having average leadership performance enhance this ability among managers.

### **Acknowledgment**

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## CHALLENGES IN PROMOTING MIGRANT ENTREPRENEURSHIP: FIRST EMPIRICAL EVIDENCE FROM GERMANY

Hartmut Meyer – Anna Pilková

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### Abstract

**Purpose:** Migrants are known for their high affinity to entrepreneurship and record for substantial entrepreneurial activities in Germany. These activities are supported by various push factors of the labour market. Migrant entrepreneurship is also known for a high risk of failure because this group has problems meeting financial standards in Germany as well as to develop a market strategy in a highly competitive environment. The main goal of this paper is to present first empirical evidence of the entrepreneurial activities by prospective migrant entrepreneurs and their specific needs to promote migrant entrepreneurship in sophisticated economies.

**Design/methodology/approach:** The research is exploratory in nature in order to understand the challenges in promoting migrant entrepreneurship. By employing the GEM research model to analyse entrepreneurial activities and models of social migration/integration, the research aims to define specific variables migrants face while entering sophisticated markets. The data for the analysis has been generated in Germany by studying migration statistics provided by the German Office for Migrations, as well as 20 in-depth interviews of migrants, including an analysis of their social background by their CV.

**Findings:** This paper provides the first insights into the expectations and motivation of migrants towards entrepreneurship. In particular, the research shows quite clearly the development migrants have to undergo within a short period of time in order to change from a survival-oriented economy, characterized by an unreliable economic environment, to an innovation-driven economy. The major challenges for migrants is to build up the required managerial competencies in order to develop a market strategy and to meet the financial standards in Germany. The analysis of the interviews showed quite clearly that the potential migrant entrepreneurs are underestimating these entrepreneurial requirements. Research/practical implications: The results of the paper show a strong need for early entrepreneurial education. Thereby there is a need to develop entrepreneurial training and consultancy programs for better knowledge transfer, based on the migrant's entrepreneurial environment. Moreover, the paper also gives some insights into the migration policy to reduce push factors towards a necessity driven entrepreneurial motivation. The required entrepreneurial training should take place within the welcome and arrival stages of the integration process in order to avoid future business failure. Here one perceives responsibility by policy makers and authorities involved in the integration process to provide the necessary resources.

**Originality/value:** The paper allows the first insights into migration entrepreneurship. On the basis of the research model, as well as a newly created understanding of the survival orientated economy, this paper gives an understanding of the need to change the attitude of prospective entrepreneurs when entering entrepreneurship. The main added value of this paper needs to be seen as giving new insights into the entrepreneurial process of migrants as well as their entrepreneurial personality.

**Keywords:** Entrepreneurship Education, Germany, Migrant, Education, Integration

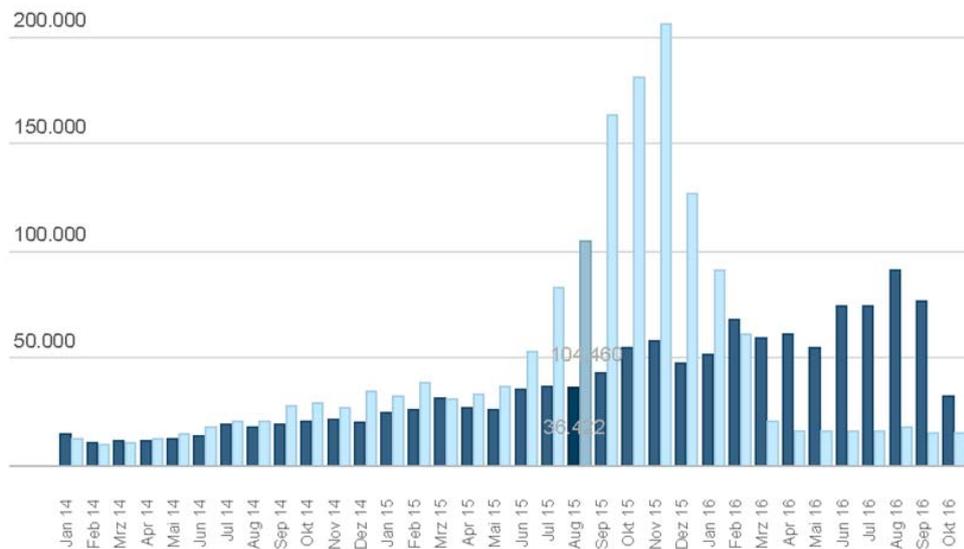
**JEL Codes:** L26, J78, N74, O38

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## **Introduction**

The integration of the migrants, in particular refugee migrants, has been a challenge for Germany, specifically over the last 3 years. Due to the civil war in Syria, more than 1 million refugees arrived in Germany in 2015, followed by almost half a million refugees in 2016. Figure 1 shows the situation in Germany from the end of 2015 to the beginning of 2016. During this time, the German authorities were primarily concerned with the registration process, which is still not complete as of today. On the other hand, the German labour market demonstrates a structural mismatch of qualified working forces (Brücker et al 2016) due to e.g. the demographic change as well as low entrepreneurial activities (GEM Monitor 2015). With the arrival of the refugee migrants there are expectations of additional resources for the labour market and later entrepreneurial activities.

The paper aims to study the situation that migrant entrepreneurs face while engaging in entrepreneurial activities, and to identify specific problem areas. The reasons for such a study have to be found at several levels. The German economy is known as an innovation-driven economy where knowledge is one of the key factors for economic success. Due to high demands placed upon applicants in the labour market, migrants face a number of obstacles while trying to integrate into the German labour market. As a result, there is a high risk of push factors towards entrepreneurship as an employment option as this type of employment offers low entry barriers. Hence at the individual level, there is a need to understand the motivation and image of entrepreneurship in Germany by migrants. On the other hand, there is a need at the institutional level to understand the specific requirements in order to offer target orientated assistance of consultancy in order to support the chances of success.

**Figure 1: AsylumRegistration and Application in Germany up to October 2016**


Source: Data Board by the BAMF EASY System, BAMF 2016

At the macro level the value of migrant entrepreneurship is mainly expected in two aspects. Within the German economy, a high number of smaller companies are seeking for succession possibilities (KfW 2015). Here migrants could fill the gap of missing successors in order to maintain the production capacities and employment opportunities. On the other hand, migrant entrepreneurs could support forthcoming trade relationships between Germany and today's countries of civil war. Here their entrepreneurial activities are regarded as key factors for social and economic recovery of their home countries where Germany could benefit from it.

The main goal of the paper is to present first information for the specific requirements needed to promote migrant entrepreneurship in sophisticated economies. In particular, the research will explain the challenges that refugee migrants face entering an entrepreneurial process in Germany. Thereby it is of interest to define the support migrants' need in order to develop entrepreneurial activities. Here it is important to understand the difference for entrepreneurs acting in a survival-orientated economic environment and a highly competitive environment like Germany (GEM Monitor 2015).

This research should give first insights into migration entrepreneurship in Germany. The main added value of this paper is in the attempt to define important variables determining the entrepreneurial process as well as their specific needs of migrants in order to develop a target orientated support.

## **1 Literature and Theoretical Background of the Paper**

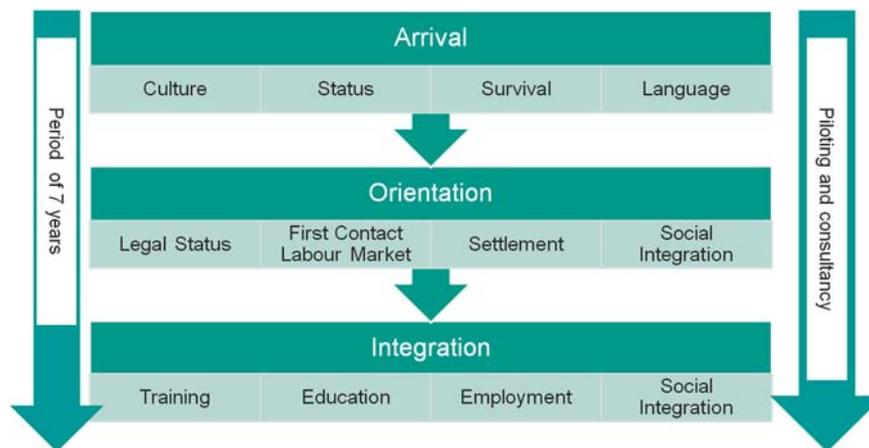
Nowadays migrant entrepreneurship is a topical subject not only for policy makers but also researchers. According to research studies, the rate of self-employment and entrepreneurship among migrants and refugee migrants is high. In Germany, they count for more than 50% of all entrepreneurial activities (KFW Research, 2015). The areas of their engagement are found in the area of gastronomy at 17%, trade at 20% and services at 19% of all entrepreneurial activities (Kay and Günterberg, 2015). On the other hand, there is evidence that points to a high discontinuation rate between nascent entrepreneurs and start ups. The main reasons are a restricted access to finance and a fear of failure (Kay and Günterberg, 2015). In particular, there are known Problems by migrant entrepreneurs to meet financial standards or to develop a market strategy in a highly competitive environment. However, migrant entrepreneurs have many positive effects to the labour market such as bringing new skills to the labour market (Waldinger et al, 1999; Hunt, 2011; Ottaviano and Peri, 2012), access and knowledge of markets in the home countries (Ghosh, 2005; Portes et al., 2002). Moreover, it could be measured that due to migrants the domestic demand increases, which results in creating jobs. There are known positive consequences on both employment rates and social security systems (Lacomba and Lagos, 2010).

The theoretical background of the paper is based on two pillars. The first pillar is to obtain an understanding of societal and economic integration of migrants. The second pillar is to interpret the task and challenges of the different economic environments to the entrepreneurial training and education in order to promote migrants as potential entrepreneurs.

In order to find an understanding of the requirements of social and economic integration, the model of the United Nation has been employed. This model has also been the basis of the German approach to integration (IAB Stellungnahme 4/2016 and BAMF 2016). According to this model, there are three major phases over a duration of 7 years that a migrant must go through until he is able to integrate. The beginning stage is experienced as the arrival phase. In this phase, the major task is to survive and register legally. Also, this phase is dominated by the effort to acquire the language and getting introduced to the culture of the host country. After settling down and being able to communicate in the country, the orientation phase begins. In this, the second phase, migrants make initial contact with the labour market and often find themselves confronted with the legal acceptance of their education. During this phase, further social integration takes place. In the last phase, integration itself is reached through training,

education, or perhaps even employment when the migrant's professional education is recognized. This is followed by further social integration. The specific point this model makes is that these phases need to be followed subsequently and the process takes place over a period of 7 years. This means that quick integration and immediate employment appear to be impossible. Hence there are a number of advisory and piloting services required in order to guide the migrants through this process.

**Figure 2: Phases of Integration according to the United Nation Model**



Source: own presentation on the basis of IAB and BAMF

In order to understand the effects of the environment on possible entrepreneurial activities, the research employed the entrepreneurial development stages according to Porter, (1990). This model for cluster economies is also employed by the Global Entrepreneurship Monitor (GEM) and other pieces of entrepreneurial research.

This model consists of three stages which are geared towards factor-driven, efficiency-driven, and innovation-driven economies. Between all stages, entrepreneurial activities and behaviour are influenced by different factors through the environmental development stage. Within this research, the model has been extended to include the phase survival-driven entrepreneurship. This stage should reflect entrepreneurial activities within an unstable environment, one without an operating institutional framework. The task is to survive by the given means which are available for trade or production.

**Figure 3: Economic Development Stages for entrepreneurship**

Survival Driven Entrepreneurship	Factor driven Entrepreneurship	Efficiency Driven Entrepreneurship	Innovation Driven Entrepreneurship
<ul style="list-style-type: none"> <li>• Dominated by the unstable environment. Production and to merchandise goods which can be obtained. Objective is to gain income and to survive as a communities</li> <li>• Issues: Civil war, political instability, arbitrariness</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Dominated by to exploit own natural resources and to build up businesses with rely mainly on labour</i></li> <li>• <i>Issues: Education, Institutions, Economic Stability</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Development of iindustrialization and an increased reliance on economies of scale, with capital-intensive large organizations</i></li> <li>• <i>Issues as Rationalisation, Import/Export, Social Security</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Knowledge and Service based economies. Highly sophisticated market and cut-throat-competition</i></li> <li>• <i>Issues: Globalisation, Demographic Change, Knowledge Worker</i></li> </ul>

Source: GEM Monitor 2015 with own admentments

The key point in this developmental stage is that prospective migrant entrepreneurs need to jump from a survival to an innovation driven economy. This means that they need to understand the change within the entrepreneurial behaviour in a very short time. In particular, the change from an unstable environment to a highly organized environment requires planned entrepreneurial behaviour. These expectations often cannot be met due to a missing entrepreneurial training and false interpretations of their own personal entrepreneurial capabilities (Kay and Günterberg, 2015). Therefore the specific task at hand for the entrepreneurial environment is to integrate both models into one comprehensive approach, thus allowing migrants to integrate successfully, as well as to succeed as an entrepreneur.

## 2 Research Methodology

The research is exploratory in nature in order to understand the challenges of promoting migrant entrepreneurship. The research methodology is based on understanding the situation rather than analysing it, e.g. the entrepreneurial behaviour or environment. By applying a recent understanding of entrepreneurial environments, diaspora entrepreneurship and social migration/integration, the research model encounters the variables of social integration as well as factors determining entrepreneurial activities (GEM Monitor 2015). The research has been organized in two major stages: In the first stage, demographics data of migrants have been collected so that a better understanding can be had of the personal characteristics of potential migrant entrepreneurs and their past experiences. This data has been generated by actual migration statistics from the German office for migrations (BAMF). In the second stage, 20 in-

depth interviews of migrants have been conducted. These interviews took place in the time period of September to November 2016. The respondents were randomly selected on the basis of registration files and they came from Syria, Afganistan, Iraq and Eritrea. The respondent was only male in the age group of 21 up to 35 years. These in-depth interviews also included an analysis of their social setting by their CV. The interviews were semistructured asking for their professional background, expectations as well as motivation to take up entrepreneurial activities. Also perceived images of their task as migrant entrepreneur in Germany have been asked. The respondents were selected randomly in collaboration with the local authorities in the area of Stade, North Germany as part of volunteer work to assist refugees in their attempt to find professional training or a professional job. The interviews were recorded and each single case was analysed according to the content method by Mayring (2000). This method allows mainly descriptive qualitative analysis in order to identify and define the variables of importance.

However, all data of this research must be evaluated with care, since most public data are not without error. For example, some refugees were counted twice in the event they had changed their initial place of residence (Brücker et al 2016). Also the interviews were hampered by language problems and accompanied by the respondent perception that the research interview would support the legal chances of residence. For this reason, when asked questions regarding their formal education or training, refugees often gave highly positive answers. It has also been determined that there are different perceptions of professional and educational terms, for example the term vocational training. In Germany, vocational training relates to a formal training scheme which the migrants often perceive as working within a company in order to acquire the necessary skills in specific areas.

### **3 Results of the Study**

Considering the **demographics** of migrants one finds in the public statistics that 73.5% of the applications for asylum were from people younger than 30 years; furthermore, more than 75% of the applicants were male. This follows suit in the sample of the interviews. In 2016, 63.9% of the migrant refugees had obtained the legal status of accepted refugee, which means that they are able to register as an entrepreneur. Thirteen percent of the migrant refugees stated to have a university degree and 12% can rely on a vocational training (BAMF 2016, Brücker et al 2016). Also, the respondents of the interviewees claimed to have had vocational training (60% of the respondents) or/and visited a university. The place of training was at 90% in enterprises

managed by relatives without any further formal education. Also, their prior entrepreneurial experiences were based on their family businesses. However, these experiences were also perceived as sufficient for the German market. Accounting requirements and formal governance of enterprises were mainly unknown. Their entrepreneurial experiences were mainly based on a daily struggle to organize merchantable products.

In the sample, 70% recorded **entrepreneurial motivation** to start up a business with the objective to gain own income as well as to prove the ability to comply with migration requirements. Official figures determining the entrepreneurial were not collected in public statistics. The main type of entrepreneurship that was stated were trade services between Germany and their home states. There is a strong desire to support the rebuilding of their home countries as well as to generate an income for their families. However, it could be observed that the respondent could be split up into two groups. The first group which was still applying for residence recorded on a stronger entrepreneurial motivation. Whereas the second group of respondents which have been accepted as refugees eased their entrepreneurial motivation and took a longer-term perspective. It seems that the acceptance of their legal status and the provision of public support had a significant impact on the entrepreneurial motivation.

Considering the **expectations towards entrepreneurship**, in 80% of the cases, rapid integration as well as social and economic freedom were expected. Entrepreneurship was valued highly by the respondents and treated as one major option for employment. However, there were only little perceptions to define unique selling points in order to provide successful service and to discover a market space. Most of them even regarded the migrants themselves as an own market. Only perceived legal requirements in Germany to start a business hampered their motives were also supported by the German authorities were expected.

With respect to **entrepreneurial experience**, these experiences have been restricted only to family-owned businesses, as the family membership was the only reliable source of income. This could be observed in more than 15 cases. Concerning the demands by financial institutions or authorities to develop a business strategy or business plan, it was found in over 70% of the cases that the respondent did not have a clear picture. This also applies to the understanding of German fiscal regulation. Awareness in developing managerial skills in order to meet competition through innovation and quality as a major feature of advanced and saturated markets didn't appear.

In most cases, one could only observe **time** constraints to getting started, sometimes with the expectation that the migrants be given financial assistance by the German government. In particular the group without been currently legally accepted as refugees had a strong motivation

to get started without a long-term plan. They also perceived to start with a low budget start-up while just start to merchandise and to develop a business incremental.

The results of data collection and the interviews showed quite clearly that all migrants were unaware of the process that they have to undergo during a short period of time in order to change their mindset from a survival-oriented economy, characterized by an unreliable economic environment, to an innovation – driven economy. In all interviews, we found out that the required changes of the structures within both economic environments were unknown. Moreover, all respondents felt that they possessed sufficient managerial competencies to meet competition and financial standards. Only in the follow up questions could one measure large discrepancies in understanding financial reporting or how to manage legal requirements. In all cases, they were unaware of the need for a structured market approach within a reliable political and economic system could be seen. On the other hand, networking competencies and the ability to organize information were also observed.

## **Recommendations and Conclusion**

With regards to the integration model by the United Nations, it is evident that there is a strong need for consultancy and advisory services, to guide the entrepreneurial motivation at a later stage for integration. This also means that there is a need for public investments in order to reduce push factors through a rapid clarification of the legal status and giving access to financial transfer of income. As the recognition of the legal status is played along with the access to regular transfer income, early perceived push factors towards the employment market or entrepreneurship eased up. Once this phase was reached, information concerning the quality of the professional training was corrected. Because the migrant refugees had a better command of the language and had first contact with the labour market, their professional skills were better evaluated. This had also considerable influence on the entrepreneurial motivation which has often only be postponed to a later stage of migration.

In particular, the results of the research confirm that early entrepreneurial education is invaluable. Thereby there is a need to develop entrepreneurial training and consultancy for better knowledge transfer on the basis of the migrant's entrepreneurial environment. Recognizing the need for entrepreneur education within the welcome and arrival stage is significant, this could channel entrepreneurial motivation in order to avoid future failures. The challenge is here, to address entrepreneurship in a comparative way of both environments as a chance without push factors of residence. Here a strict hand on approach by the institutions

managing entrepreneurship is requested. The results of the paper suggest that it is vital to recognize the motivation of migrant entrepreneurs and to support it through the provision of coaching possibilities. In light of the first interviews, future areas of research and initiatives should be conducted according to the following clusters:

**Table 1: Recommendations and future research**

Cluster	Recommendations and Issues
Entrepreneurial Personality	<ul style="list-style-type: none"> <li>• The need for early entrepreneurial education in order to avoid failures and misleading resources. Entrepreneurial education should be part of the language course.</li> <li>• In particular, the education should consist of a comparison of the two development stages of the economy in order to allow a development of entrepreneurs</li> <li>• To understand better entrepreneurial behaviour in survival driven economies for the design of training courses.</li> </ul>
Process of Entrepreneurship	<ul style="list-style-type: none"> <li>• The need for a hands-on-approach in the development of entrepreneurial activities.</li> <li>• To offer consultancy for the development of business plans and the correct evaluation of risk</li> </ul>
Social Environment	<ul style="list-style-type: none"> <li>• To open up consultancy and counselling services at an early stage for refugee entrepreneurs independent of their legal status.</li> <li>• Rethink the barriers to market entry towards refugee-entrepreneurship in order to avoid failures.</li> </ul>
Entrepreneurial Environment	<ul style="list-style-type: none"> <li>• To provide specific financial scheme for migrant entrepreneurship</li> <li>• To support networking activities between migrants and German institutions</li> <li>• To allow early access to consultancy in order to avoid misleading activities.</li> </ul>

Source: own work

Above all, the research confirms existing findings presented in the literature review that there is high entrepreneurial potential within the migrants, allowing for new chances in the market. But more of a structured approach must be applied to take advantage of it. On the other hand, the required financial resources need to be seen from a German standpoint as a long-term investment. If all of these processes are correctly implemented, a lot of business opportunities in Germany will appear in the future, once the situation in the migrants' countries is fixed and has been changed.

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## USING COMPETITIVE TECHNICAL INTELLIGENCE PATENT SEARCH METHODS TO UNCOVER AUTOMOTIVE INDUSTRY TRENDS

Zdeněk Molnár – Jan Černý

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### Abstract

**Purpose:** Patent information is widely known as a valuable source for Competitive Technical Intelligence (CTI) focused on competitor activity analysis in the technological field. Moreover, patent classification schemes provide us with a unique possibility to discover industry trend directions and key players in a particular field. This paper aims to describe the importance and use of a patent classification for CTI purposes directed towards the automotive industry.

**Design/methodology/approach:** The authors have used the Global Patent Index bibliographic database to present search syntaxes with International Patent Classification codes to uncover the key players and trends in the automotive industry focused on forms of protection against, or prevention of injuries to drivers, passengers or pedestrians in the event of accidents or other traffic hazards.

**Findings:** The patent classification plays an important role in narrowing down a specific patent search for Competitive Technical Intelligence purposes. It also specifies the innovation directions for a particular technology. The results of this paper show the ten main innovative companies in the field of road safety between the years 2014 and 2016 based on the searches, and indicate that Toyota is the leader in vehicle safety innovation in this period. We have also determined the ten main product invention categories, and that occupant safety arrangements or fittings lead current industry trends.

**Research/practical implications:** The paper represents implications for CTI advanced search methods and activities leading to innovation. The search process can be applied in other technology fields.

**Originality/value:** This paper proposes a method for effectively using patent information for CTI purposes focused on the automotive industry.

**Keywords:** Competitive Technical Intelligence, patent information, patent classification, search methods, intellectual property, automotive industry

**JEL Codes:** O31

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## **Introduction**

Competitive Technical Intelligence (CTI) as a subset of Competitive Intelligence can be defined as collecting, analyzing and disseminating data, information and knowledge from an external company environment where technology is a common aspect (Coburn, 1999; Porter, Schoeneck, Frey, Hicks, & Libaers, 2007). The main tasks of CI focus on the following technical intelligence topics: Strategic planning of R&D, Early Technical Warnings (ETW), Key players, Commercialization. Patent information is one of the crucial tools for analysis of the competitive environment, as well as for determining trending technologies and disruptive innovation activities. Moreover, patent classification schemes are essential when performing competitive intelligence secondary search.

For example (Kwon, 2012) analyzed the global green car field through the patent activity index, technology distribution by the patent applicant's nationality, and patent levels, where patent classification codes were among main input query values. (Jürgens & Herrero-Solana, 2017) used patent classifications to determine nanotechnology trends including identifying how the schemes help to anticipate the content analysis problem in this technology field, because keyword search does not fulfill information needs regarding nanotechnology interdisciplinarity. The importance of patent classification in connection to competitor analysis was suggested by (Park & Yoon, 2017). They discovered that competitive level is determined by the number of patent application in specific IPC code and if the small number of companies are significantly active in specific field, it is considered as competitive. But regarding CTI an important direction is also given by technology life-cycles. According to (Leydesdorff, 2015) they can be indicated by the variety of patent classification.

We can effectively use patent classifications for gathering for all four CTI topics mentioned above. Strategy planning information needs focus on industry trends, commercialization departments monitor the process of the ageing of each of the inventions, ETWs bring information about new classification notations as brand new technology field information signals, and last but not least we can extensively analyze the key player activities in detail (Pičman, 2009; Porter et al., 2007).

For the purposes of this study we have chosen to analyze International Patent Classification (IPC). This will then be used in the Global Patent Index bibliographic database that allows us to build search syntax by using classification codes. We will work with the specified field of innovations – protection and prevention during possible negative traffic events.

## 1 IPC and its Research Scope

The first version of the IPC went public in 1968, and after the Strasbourg Agreement, which came into force in 1975, it became the common classification system for patent documents of inventions, including patent applications, utility models and utility certificates (WIPO, 2015). The IPC has several functions (WIPO, 2015). Firstly, it is a powerful tool to determine the novelty and to evaluate the inventive steps and non-obviousness that affect the patentability of each invention. Furthermore, it is considered as a powerful search tool for retrieval of the required scope of patent documents. Secondly, it facilitates access to the technology and legal information contained in patent documents. Last but not least, it is a must-have tool for conducting a state-of-the-art search and plays a crucial role as the basis for generating information-rich statistical analyses.

### 1.1 Structure of the IPC

In this part we present the structure of IPC as a complex and structured classification through the levels in its hierarchy (WIPO, 2016), (WIPO, 2015).

The IPC is divided into eight sections that represent the highest level of a hierarchy. A section is put together with **a)** the Section symbol through the letters A – H, **b)** the Section titles which determine the broadest field of inventions, and **c)** subsections, which are the inner parts of sections without a specific code. The sections are further divided into Classes, and these are represented by a two-digit code and Class titles that show the scope, and in some cases by a Class Index that contains information about the update (e.g. **B60 VEHICLES IN GENERAL**) The Subclasses then represent a further structured class and they are the first specifying element of a given technical field (e.g. **B60R VEHICLES, VEHICLE FITTINGS, OR VEHICLE PARTS, NOT OTHERWISE PROVIDED FOR** (fire prevention, containment or extinguishing specially adapted for vehicles A62C 3/07)). The IPC Groups works as the extension of the Subclass and can be distinguished as **a)** The Main group with a one to three-digit number, stroke, and the number 00 together with the title of the Main Group (e.g. **B60R 22/00** Safety belts or body harnesses in vehicles), and **b)** The IPC Subgroup is represented by two or three digit numbers together with the Subgroup title. Before the example of a subgroup we also need to discuss the special hierarchy dot system in each of the Subgroups that precedes the Title of the Subgroup. The Subgroup with one dot is the head of the following subgroups with two to a maximum of six dots. Consider the Subgroup **B60R 22/34 (Belt retractors, e.g. reels)** and the

Subgroup 22/343 **with electrically actuated locking means**. The second Subgroup here should be read as **Belt retractors with electrically actuated locking means**. The important fact is that we must consider determining a hierarchy level by dots, not by Subgroup number.

## 2 Using Patent Systems for Key Player and Industry Trends Search

According to the World Health Organization (WHO) the number of traffic accidents have stagnated since 2007 relative to a 4% increase in world population and a 16% increase in motorization. In 2013 there were 1.2 million traffic accidents with over 50 million injuries. Moreover, traffic accidents play a major role in the mortality rate of young people aged between 15-29 years (WHO, 2015).

Nevertheless, the plateau in the number of accidents shows that the adopted measures in developed countries have saved lives and the process of new measures could be considered as efficient, e.g. Europe has the lowest mortality rate – 9.3. per 100 000 population (year). By contrast, the poorest statistics are found in the African region, where the mortality rate is 26.6 per 100 000 population (WHO, 2015).

The situation is even worse when we analyze pedestrian, cyclist and motorcyclist death rates. These make up nearly half of all deaths on the roads in the African region. Another negative number comes from the Americas, where motorcycle accidents rose from 15% to 20% of total road traffic deaths if we compare 2010 and 2013 (WHO, 2015). The United Nations has brought a new initiative called the 2030 Agenda for Sustainable Development (United Nations, 2015) and its two parts relates to improvement of road safety. Two targets in the 2030 Agenda are to halve the number of global deaths and injuries from road traffic accidents by 2020 and by 2030 to provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations: women, children, the disabled and the elderly.

Safe vehicles play a critical role in reducing the death and injury rate in terms of road safety and in past years the situation has led to implementing more safe elements into cars as the consumer demand for safer cars has increased. Moreover, the process of considering these elements as obligatory parts in vehicles has only just begun in some countries. Nevertheless, vehicles sold in 80% of countries do not meet the safety standards (WHO, 2015).

In view of these circumstances we can expect that the competitive environment in the field of vehicle and road safety elements will become even stronger and the demand for patent protection services and patent information services will be more important.

## 2.1 Search preparations

The purpose of this chapter is to design a patent search syntax with IPC codes relating to road safety and to reveal the latest technological developments in this field. Before we build a state-of-the-art search syntax with the IPC codes related to traffic safety elements we also need to establish a keyword set describing a given search problem (see Fig. 1).

**Fig. 1: A content analysis of the search problem**

Entity	Global Patent Index
Safety field	prevention, protection, injury, death, safety, road safety, guard, accident
Traffic participants	vehicle, car, motorcycle, motorcycle, motorbike, motorbiker, pedestrian, passenger, driver, truck, lorry, cyclist, biker
IPC codes	B60R 21/00, A62C 27/00, B64G 1/16, B65G, B65G 67/00, B66C 23/36, B66F 9/06, F16M 3/00, F17C 1/00, F25D4.

Source: authors

We have chosen the Global Patent Index (GPI) database (EPO, 2014) for our example, where we will perform a search with a specific syntax. The GPI as a bibliographic database provides unique insights into the more than 101 million patent documents.

We have analyzed the query syntax possibilities and the GPI works with the following search tools (see Fig. 2):

**Fig. 2: Global Patent Index Search Tools**

GPI Search Tools	Values
Boolean operators	AND, OR, NOT, ANDNOT
Proximity operators	The proximity operator /Xw implies the distance between two terms regardless of the order where X is the number. If use +Xw entry, the two terms must be in the same order within a given distance.
Arithmetic operators	= equal to value in the field code  >=, <=, <, > are mainly used in date field codes.
Wildcards	* (asterisk) implies zero or more characters and can be used in any part of the term.  # (hash) implies for one mandatory character  ? (question mark) implies for one or zero character
Other	Brackets [] are used for a date range.  Parentheses () affect the order of how the logic sets will be searched.

Source: EPO

## 2.2 Latest developments search in the road safety field

Firstly, we perform a search experiment with all the keywords separated into the sets given above in Fig. 1 We suggest this syntax:

*WORD = ((vehicle? OR car? OR motorcyc\* OR motorbike\* OR pedestrian? OR passenger? OR driver? OR truck? OR lorr??? OR cyclist? OR biker?) AND (prevent\* OR protect\* OR injur\* OR death? OR dead?? OR safe?? OR "road safety" OR guard? OR accident?))*

We have over 600k results.

We must definitely narrow the search with a date limit. Searching for the latest developments means setting the date range of patent application publications between 2014 and 2016.

*WORD = ((vehicle? OR car? OR motorcyc\* OR motorbike\* OR pedestrian? OR passenger? OR driver? OR truck? OR lorr??? OR cyclist? OR biker?) AND (prevent\* OR protect\* OR injur\* OR death? OR dead?? OR safe?? OR "road safety" OR guard? OR accident?)) AND PUD [2014,2016]*

The result set now contains over 141k documents

The importance of IPC usage comes at this point when we add it to the existing search syntax as a significant specifying factor.

*WORD = ((vehicle? OR car? OR motorcyc\* OR motorbike\* OR pedestrian? OR passenger? OR driver? OR truck? OR lorr??? OR cyclist? OR biker?) AND (prevent\* OR protect\* OR injur\* OR death? OR dead?? OR safe?? OR "road safety" OR guard? OR accident?)) AND PUD [2014,2016] AND IPC = ("B60R 21/" OR "A62C 27/" OR "B64G 1/16" OR "B65G" OR "B65G 67/" OR "B66C 23/36" OR "B66F 9/06" OR "F16M 3/" OR "F17C 1/" OR "F25D")*

This set with IPC codes consists of 7 364 key patent families. We have chosen the first ten companies and will try to use different forms of their names in another search. The reason for this content analysis step is to get the most accurate number of patent applications for a particular company.

### 3 Results

The following list (See Figure 3) represents the main innovative companies in the field of road safety between the years 2014 and 2016 (December) based on our searches.

**Fig. 3: The key innovating companies in the field of road safety**

Company Name	Number of patent applications (2014 – 2016)
Toyota	244
Hyundai	227
Autoliv	185
Bosch	120
Denso	120
Daimler	84
Toyoda Gosei	84
Ford	83
Fuji	78
Honda	67
Baic	60

We can go further and analyze what kind of specific technology a particular company has been developing. The GPI data based upon our last search gave us the IPC codes analyzed in the following table (See Figure 4).

**Fig. 4: Industry trends technology analysis through the IPC codes**

IPC Code	Number of documents	Description of invention
B60R 21/02	569	Occupant safety arrangements or fittings.
B60R 21/01	332	Electrical circuits for triggering safety arrangements in case of vehicle accidents or impending vehicle accident.
G08G 1/16	277	Anti-collision system.
B60R 21/34	251	Inventions protecting non-occupants of a vehicle, e.g. pedestrians.
B60R 21/0134	200	Arrangements or fittings on vehicles for protecting or preventing injuries to occupants or pedestrians in case of accidents or other traffic risks responsive to imminent contact with an obstacle.
B60R 21/013	198	Electrical circuits for triggering safety arrangements in case of vehicle accidents or impending vehicle accidents including means for detecting collisions, impending collisions or roll-over.
B60R 21/015	171	Electrical circuits for triggering safety arrangements in case of vehicle accidents or impending vehicle accidents including means for detecting the presence or position of passengers, passenger seats or child seats, e.g. for disabling triggering.
B60R 21/207	152	Arrangements for storing inflatable members in their non-use or deflated condition; Arrangement or mounting of air bag modules or components in vehicle seats.
B60R 21/0136	149	Electrical circuits for triggering safety arrangements in case of vehicle accidents or impending vehicle accidents including means for detecting collisions, impending collisions or roll-over responsive to actual contact with an obstacle.
B60R21/231	122	Inflatable members characterized by their shape, construction or spatial configuration.

Subsequently, the GPI provides us with the possibility of characterizing the specific inventions of each searched company according to a given IPC code. We have chosen Toyota and the IPC code B60R 21/02. Our syntax for this example should be built as follows:

*WORD = ((vehicle OR car OR motorcyc\* OR motorbike\* OR pedestrian? OR passenger? OR driver? OR truck? OR lorr??? OR cyclist? OR biker?) AND (prevent\* OR protect\* OR injur\* OR death? OR dead?? OR safe?? OR "road safety" OR guard? OR accident?)) AND PUD [2014,2016] AND IPC = ("B60R 21/02") AND APP = (toyota\*)*

Seven documents from Toyota describe the company's latest developments in occupant safety arrangements or fitting (B60R 21/02). These are:

1. *Rear Seat Occupant Protection Device of Vehicle*
2. *Vehicle Body Structure*
3. *Occupant Protection Device for Case of Vehicle Side Collision*
4. *Automobile Front Pillar Bottom Structure*
5. *Right-Foot Protection Structure*
6. *Impact Absorption Structure*
7. *Glove Compartment Box with Tear Seam*

We can perform a deep technical analysis of all these inventions through the full accessible patent application details and map a competitive environment in this field.

## **Conclusion**

The International Patent Classification System is a global, regularly updated scheme that provides unique insight into different technology fields. In the first part of this paper we discuss the structure, function and usage of this system and its framework together with search possibilities of particular IPC codes for specific technology as the initial preparation for patent searches.

The second part describes an example of patent search for Competitive Technical Intelligence secondary information research activity purposes. This part also analyzes the search process for the given topic of forms of protection against, or prevention of injuries to drivers, passengers or pedestrians in the event of accidents or other traffic hazards for automotive industry purposes. We have focused on key player and industry trend analysis.

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## TECHNOLOGY AND KNOWLEDGE TRANSFER AS THIRD MISSION ACTIVITIES AT THE SLOVAK UNIVERSITIES

Danka Moravčíková – Štefan Rehák – Martina Hanová – Libor Vozár

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### Abstract

**Purpose:** This paper deals with issue of the impact and relationship between universities and regions. The authors identify the third role and related tasks for academic education and research in context of the regional development. They describe and compare the activities and contribution of the Slovak universities in the field of knowledge and technology transfer. The study discusses also the specific problems of cooperation between universities and regions.

**Design/methodology/approach:** The paper reports selected results of a survey carried out for The Ministry of Education, Science, Research and Sport of the Slovak Republic within the project “Strengthening the Impact of Higher Education in the Regions”. Two thirds of universities in Slovakia participated in the questionnaire survey. Qualitative information was obtained from eight focus group interviews with representatives of regional authorities, employers, academic representatives and NGOs representatives from four aggregated regions (Bratislava, West, Middle and East Slovakia).

**Findings:** This paper offers an empirical picture of initiatives connected with universities’ concern about the needs of the future employers, support of entrepreneurial activities and innovative entrepreneurship in the region. The authors point to the fact that in developed countries, firms pull the new research results from universities, while in Slovakia there is rather a push effect when universities attempt to push their research results into reality of commercial firms. They mention that the dividing line between applied research and innovations are not at all clear and also point to weaknesses in the activity of universities concerning intellectual property rights protection.

**Research/practical implications:** The authors provide case studies of four Slovak regions highlighting the opportunities, barriers and challenges in surveyed issues. They formulate also concrete policy recommendations. Presented information and findings need further examination through a broader analysis, but they also emphasize the importance of better understanding and explanation of the third mission of universities in the Slovak context.

**Originality/value:** The paper represents a specific approach of studying third mission activities of universities and contributes to discussion of transferring the academic knowledge and technologies by empirical outlining these activities.

**Keywords:** technology transfer, knowledge transfer, universities third mission

**JEL Codes:** O30, R11

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## **Introduction**

Higher education institutions are considered as one of the most important source of knowledge in the economy and governments deal with the way in which it is possible to mobilise their potential for economic development (Arbo & Benneworth, 2007). We can identify three groups of activities, by which the universities influence the regions in which they are located. Education and research are those two traditional activities, which improve human capital and technological level of the economy. In recent years, emphasis is put on an active engagement in regional development, which represents the third group of activities (Etzkowitz & Leydersdorff, 2000; Chatterton & Goddard, 2000; Arbo & Benneworth, 2007). While the first two missions of universities are aimed mainly at improving the economic development, the third mission extends the role of universities towards broader aspects of regional development – development of the quality of life of the local people or improvement the efficiency of public services.

Universities support the development of the region in such case, if their activities are connected with the needs of manpower, businesses and inhabitants of the region. Space is therefore the key aspect. If the universities e.g. do not reflect the needs of manpower or businesses in the region and provide education mainly for the people from outside the region, who will, after graduating, leave the region, such education has only a limited impact. Similarly, we can analyse the way in which the research and development carried out at the university influence a technological development of the region and innovations in regional businesses. Decoupling of research and development from the needs of regional businesses means that the economic effect from investments into research and development takes place either outside the region or does not take place at all. Third group of activities represented by community development has the closest link to regional development. It leads to development of cultural and civilised society in the region and includes the range of activities in the field of marginal groups and development of culture, sport, environment, etc.

### **1 Assessment of the Impact of Universities on Regional Development**

Several towns, regions, states and international institutions try to find out the way in which the universities contribute to regional development and identify the mechanisms, policies and strategies of involvement of universities in local and regional development. They also try to describe the motivation and barriers of involvement of universities into cooperation. OECD publication (2007) “Higher Education and Regions: Globally Competitive, Locally Engaged”

aims to explain the importance of universities for development of regions in global economy and points out that the universities represent the key factor that affects the local availability of new knowledge and technologies. In 2011, European Commission has published a guide “Connecting Universities to Regional Growth”. It was aimed to help public authorities to encourage the active involvement of universities and other higher education institutions into regional innovation strategies for smart specialisation and into cooperation with research centres, businesses and other civil society partners. The issue of better involvement of universities into regional development is also the part of Europe 2020 Strategy, which emphasizes the role of innovation in intelligent, sustainable and inclusive growth. Regions as the venues of interactions among public authorities, businesses and civil society are an important place for innovations. According to this guide, universities bring the development of the region in four fields: research and innovations; business and corporate development; human capital development and strengthening of social equality.

This paper represents selected results of a survey carried out by the authors for The Ministry of Education, Science, Research and Sport of the Slovak Republic within the project “Strengthening the Impact of Higher Education in the Regions”<sup>28</sup>. For the purpose of this study, which examined the activities of Slovak universities in the field of regional development in SR, the authors suggested to divide the activities of universities into three areas - education aiming at improving skills and increasing qualification of the labour force, research oriented at technological development and innovations in companies, community development aiming at improving social cohesion, quality of life, environment and a better functioning of institutions. By means of an electronic survey by questionnaire targeting 35 universities in SR, the authors mapped the activities of universities in SR in the field of regional development in above mentioned three areas. The questionnaire (together with the support letter from The Ministry of Education, Science, Research and Sport of the Slovak Republic) was distributed in the printed and electronic way, too. Statutory representatives were responsible for answering, the rectors delegated relevant members of the university managerial board to fill the questionnaire. Two third of questioned universities actively participated in the survey with a clear dominance of public universities. Standard statistical methods were used for the data analysis. The authors concentrated on four Slovak regions: Bratislava, Western Slovakia, Central Slovakia and Eastern Slovakia. In each region the authors/researchers organized two focus group interviews consisting of representatives of regional authorities, employers from the region, representatives

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<sup>28</sup> The full text of the study in the Slovak language is available at <http://www.minedu.sk/projekt-posilnenie-ulohy-vysokych-skol-v-regionoch/>.

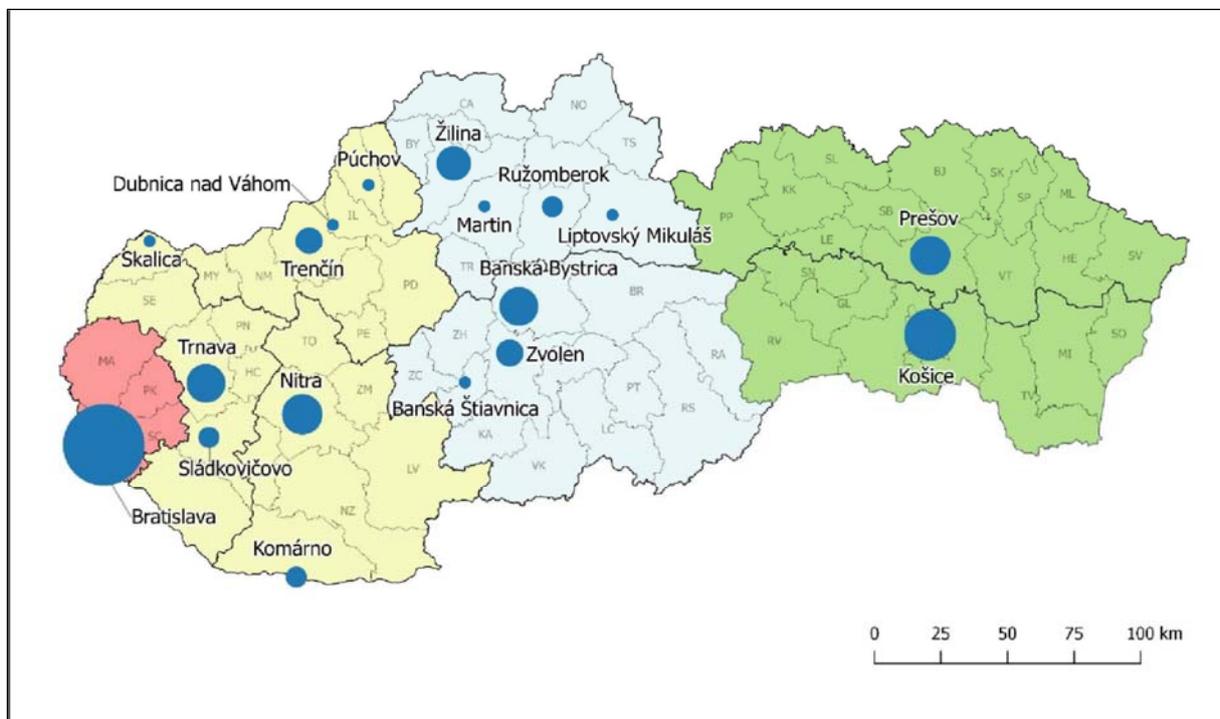
of universities and of non-governmental organizations focusing on the regional development. The discussions with these groups lasted around ninety minutes, and topics for discussions were known beforehand and concerned generally cooperation between these groups of stakeholders. The qualitative statements of the representatives of universities, companies and other organisations regarding mutual cooperation and potential contribution are interpreted in section 2 of this paper.

### **2.1 Regional Dimension of Higher Education in the Slovak Republic**

Currently, there are 35 higher education institutions with 115 faculties in Slovakia. Altogether 20 higher education institutions have a character of public university, 12 are private and 3 are state universities. Compared to 1989, the number of universities and their faculties has increased threefold. Altogether 19 towns can be considered as university town, i.e. the town which is a seat of at least one faculty. The largest centre of university education is Bratislava, the second largest is Košice and Nitra and Prešov are on the third place. Outside the university towns, universities provide education also in other towns using their detached workplaces. Regional dimension shows that approximately 38% of students are studying in Bratislava Self-Governing Region. The second largest centre of higher education is Košice Self-Governing Region (13 %) and Nitra Self-Governing region is on the third place with 11%. Since the regions are different in terms of their size, number of students is calculated per 1,000 inhabitants of the region. In short term, large share of university students in the region brings positive features from the aspect of higher demand for goods and services and short-term increase of labour supply in the region. Also in this case, universities in Bratislava Self-Governing Region have the biggest share. Nitra and Košice Self-Governing regions follow with a significant gap. Universities in Trenčín and Prešov Self-Governing regions have the lowest share. The growth of the importance of higher education in Slovak economy is not connected only with number of students. At the same time, the growth of the importance of universities as research institutions can be observed. Compared to 2002, the amount of funds for research and development increased from EUR 19 million to EUR 230 million in 2014. This growth was significant mainly after 2010. Nowadays, the share of universities on expenditures for research and development is 34.4%, while in 2002 this share was lower than 10%. Massive growth of the universities' share on expenditures for research and development was mainly due to the entry of Slovakia into the EU in 2004. However, relative importance of universities in funding of research and development was slightly decreasing after 2011 as a result of increase of expenditures of the business sector. Increase of the universities' importance in research and

development is uneven. There are significant differences among regions both from the aspect of capacity distribution as well as from the aspect of outcomes and productivity of research and development within Slovak regions. From the regional point of view, Bratislava Self-Governing Region is dominant in the field of university research, since it gathers more than one third of all research and development capacities of universities in Slovakia (5,404 employees). Košice Self-Governing region is on the second place (2,394 employees) and Žilina Self-Governing region is on the third place (2,182 employees).

**Fig. 1: Location of Higher Education in Slovak Republic**



Source: own processing

## 2.2 Activities of Slovak universities in the field of regional development

The questionnaire survey showed an increasing trend in a number of faculties or universities that implement their own initiatives in the field of the needs research of potential future employers of their graduates in time frame 2012 – 2014 (Fig. 2). It can be assumed that this trend is affected both by ongoing whole-society discussion on the quality and applicability of graduates of Slovak universities in the context of the labour market needs and by the efforts leading to approximation of academic and business sector as well as the activities of businesses towards the education of future graduates or employees (Fig. 2).

Higher education institutions carry out associated activities that include the adaptation of content of the study programmes based on the communication with practice and efforts to

adapt the study programmes according to its requirements. When asked whether universities or their faculties conducted the transformation of their educational programmes in cooperation with practice within last three years, 12 out of 16 universities (respectively 39 out of 73 faculties) answered positively.

**Fig. 2: Needs research of future employers – number at the level of faculties and universities in years 2012-2014**



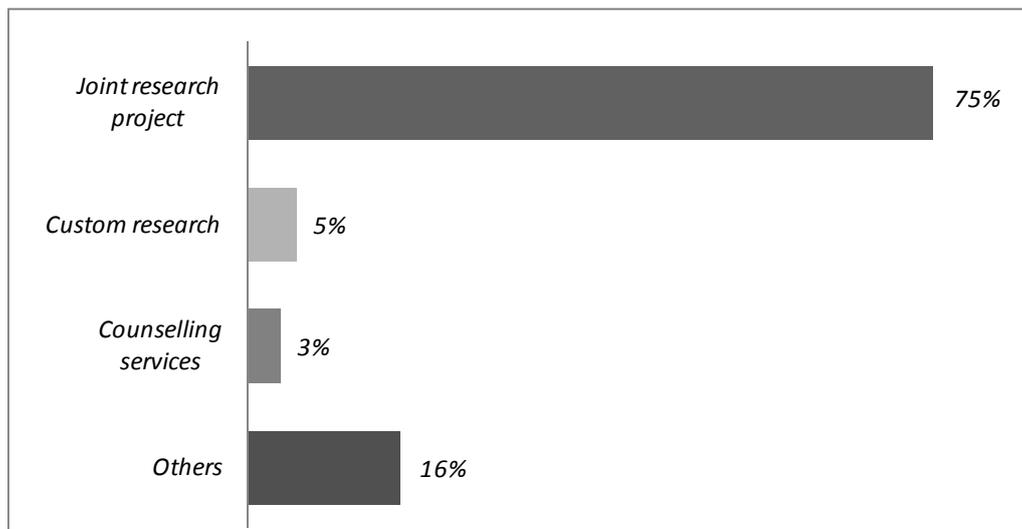
Source: own processing based on questionnaire survey

Business incubators were and are created at the universities mainly within the projects of science parks. Their success and lifetime is very diverse and depends on a number of external factors. Some of them act as independent institutions. Regular events such as career days, presentation days, days of graduates, university labour markets, etc. represent another type of activities related to entrepreneurship and employment. Several schools run various career centres, counselling and information centres or portals for students and graduates offering guidance, scholarship programmes, mediating jobs and offering internships or career counselling. Some of these activities are organised directly by the universities, the other ones are provided by private companies and agencies. In such cases, universities provide support in the form of presence of the students, professional background, human resources, etc.

Cooperation between academic sector and practice is necessary and should be a key part of the universities' research activities. Due to the specific situation in Slovakia, it is necessary to consider sensitively the feasibility and applicability of cooperation models that are successfully applied abroad. Scientific potential of universities is indeed significant, but forms of its use are more individualised than institutionalised. It is often that topics of research

cooperation are adapted more to the existing funding schemes than to the real practice needs. Cooperation in developed countries with knowledge-based economy is usually based on the “pull” principle, where the companies are intensively looking for the new outcomes from research and development activities of the universities. But in Slovakia (and other EU countries), this principle is replaced by the “push” effect, where the universities and research institutions try to promote and apply their outcomes in practice.

**Fig. 3: Forms of cooperation between universities and practice**

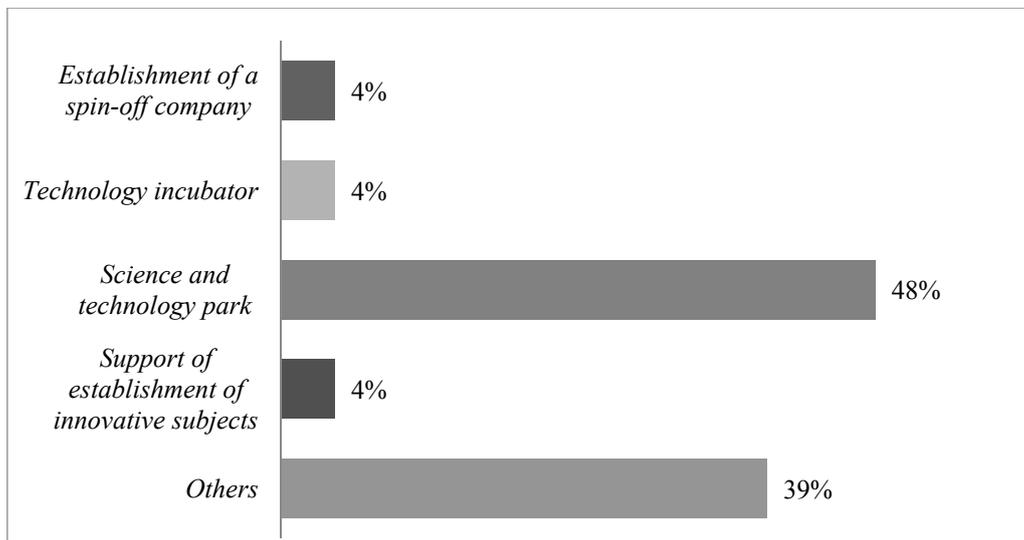


Source: own processing based on questionnaire survey

In relation to academic research and development, innovation can be defined as the final implementation stage of the process: basic research – applied research and development – innovation, where the boundaries between individual stages are not always clear. This concerns in particular the interface between applied research and development on the one hand and innovation on the other hand, since the innovation process does not always take place in a given subject. Questionnaire survey shows again the evident predominance of building of university science parks. This is related to socially and politically defined strategy of Slovak society in this sector. In order to establish 8 science parks at Slovak universities, the total amount of EUR 280 million in form of non-repayable grant was allocated from EU funds within Operational Programme Research and Development and from the state budget in 2013. Universities had co-financed these projects using their own resources in the total amount of approximately EUR 15 million. The issue that universities with science parks (and excellently equipped workplaces) currently address is how to ensure their day-to-day running, their use for applied research and, strictly spoken, their survival. Examples from abroad clearly show the need of multi-source

investments into research infrastructure including human capital and on multiple levels (state, regional and local). At the same time, return of these investments cannot be expected in the short term.

**Fig. 4: Forms of support of innovative entrepreneurship**



Source: own processing based on questionnaire survey

This approach represents the real implementation of principles of knowledge-based economy (or society with knowledge-based economy) into social practice. But in Slovakia, this is so far present only at the declaratory level that does not give universities the opportunity to demonstrate their practical skills and quality. Instead they have to address the bureaucratic administration of projects' sustainability more than their real operation for the needs of the region and the whole society. Patenting, licensing and commercialisation of intellectual property and commercial use of facilities in the Slovak academic sector are the fields, where there is a confrontation between academic and business sector. It is not only different "vocabulary" or "communication language" that complicates the interaction between these sectors, but there are also problems related to national legislation and conditions of sustainability monitoring of so called euro-projects (commercialisation as a goal of project activities versus non-profit principle as a goal of sustainability).

### **3 Reflection of the third mission of universities: regional profiles**

Universities in Bratislava are more focused on their national and international status than on their regional position. They aim to retain their "national identity" and develop their image of national and international universities. Activities in favour of the region are not implicitly

incorporated in their strategic documents. Their cooperation with Bratislava-Self Governing Region is not visible as well.

Universities located in the regions of the western part of Slovakia have the activities related to their third mission usually enshrined in their strategic documents. Its declaration is assessed very positively, but at the same time universities point out the fact that there are no concrete measures, support tools and financial resources for its implementation. Actors perceive it mostly depending on their orientation, number of students, period of existence and demand of environment in which they are active. In case of longer established universities, such activities are traditionally carried out without being classified as an additional task or a third mission. Transfer of science and knowledge into practice and so-called service for region are considered as the main activities related to the third mission. These activities are usually interlinked with the character of the university and the specific mission resulting from it. Mainly due to the method of financing of higher education, the orientation on education and research currently prevails. This method forces universities to implement only specific activities and restricts the range of potential activities. Universities and their faculties are focused differently and this is reflecting also in varying extent of participation at the activities related to fulfilment of the third mission. This is very strongly conditioned by the interest and declared need for cooperation from potential clients, who want to cooperate with universities in the fields that they primarily consider as active, competent or of a good quality.

Understanding of the third mission of universities and their competence in the process of regional development should be much more intensive in the Slovak conditions. Universities as important development actors have their position in the regions and their role should be defined more clearly in strategic documents at both regional and national level. Economic structure and specialisation of the region and character and profile of the universities (or faculties) located within it should be reflected. As stated in their long-term development plans, both technically and socially oriented universities in self-governing regions of central Slovakia are interested in popularisation of education, science and research. It can be therefore concluded that they both subconsciously and consciously understand their third mission. Its extent is limited by sources and capacities of each university and how can these activities enhance their competitiveness. At the same time, however, arises the question in what extent should the competitiveness of universities be understood: in regional, national, international? Although local authorities consider universities as partners for the regions and systematically seek to declare it, an attitude of the public is a society-wide problem. The public usually does not

perceive tertiary education institutions as “natural authorities”. This is totally different compared to the model of traditional universities and value of education in other countries.

In the region of eastern Slovakia, the role of the third mission of the universities is perceived very intensively. If we compare the atmosphere of group discussions, we can even say that here it is the most intensive perception. Universities from this region consider the third mission as a natural part of their existence, whose main purpose is to be high-quality and thus competitive educational institution. They use the term “regional engagement” and link it with the key task of strengthening regional and institutional identity. This term is used for linking education with needs from practice as well. The basic issue is also to clarify the added value of position of “universities out of Bratislava” in regional development, where the need for closer links among actors is more significant. Universities acting in regions out of the centre have to engage in the region but at the same time are closer to its needs. They also affect the public opinion in the region. Not inconsiderable dimension is the economic dimension associated with the purchase of goods, services and the consumption in the region. Universities have an economic impact on the creation of regional GDP as well as on the inflow of subsidies from EU Structural Funds and, indirectly, also on regional (un)employment. Support of creation of the new career opportunities for graduates in the region means a big challenge for highly specialised universities as well. Attractiveness of higher education is strengthened particularly in the spatial context at the axis of regional centres Košice and Prešov. Universities from this region played an irreplaceable role in development of regional innovation strategies for smart specialisation. This was necessarily connected with understanding among regional and local authorities and universities (and not only among their top representatives) in the region. Within this cooperation in favour of the region, both parties had to be proactive and initiating and not passive and “waiting” for suggestions. An important goal is to further extend the scope of the universities farther from the district centres (Košice and Prešov) and make the whole region more attractive.

## **Conclusion**

With a population of approximately 5 million inhabitants Slovakia represents a small economy, which is however characterized by big regional differences. The higher education system in SR is affected by two principal factors – the heritage of a centrally planned economy and the subsequent transformation process. The natural connection between universities and regional companies, the civil society and other regional stakeholders is in the process of creation.

Universities are not inevitably attached to their immediate environment and the degree of cooperation significantly differs among the regions. On the other hand, universities carry out a wide range of activities, which go beyond their narrow specialization in technological development and orientation at economic growth. At national level the key institution is the Slovak government and the respective ministries. With regards to the relatively new area it is in the first place important that the government declare its interest in the development and support of an active participation of universities in regional development. A higher degree of cooperation among the regional stakeholders is conditioned by their mutual communication regarding the needs and possibilities and therefore it is necessary to promote the creation of communication platforms. The second area is general institutional support with the objective to fulfil the mission of the university that is defined together with the regional stakeholders the regional self-government and potential customers of the outputs of universities. The current system of accreditation of study programmes focuses on the internationally accepted scientific productivity of staff, which however does not necessarily provide for universities' adapting to the needs of the Slovak regions. The local and regional self-governments represent natural partners for universities, yet the forms and the scope of cooperation with universities vary significantly. Direct financial support of universities by the self-government does not take place as it is only primary and secondary education that lie within the competencies of the self-government. A potential area of cooperation is in particular the preparation of strategic documents and analytical materials for self-governments.

Continuous and intensive communication between academic and business sector as well as the establishment of adequate and stable infrastructure to implement various forms of joint activities is a key factor of successful linking between academic sector and economic practice. Despite the different motivations and expectations of both categories of actors, it is essential from both state and public administration to establish mechanisms and schemes to motivate both sides for more intensive cooperation.

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## **WINE MARKETING: THE CASE OF MICRO AND SMALL WINE COMPANIES IN THE CZECH REPUBLIC**

**Anastasia Murínová**

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### **Abstract**

**Purpose:** Wine marketing is one of the main reasons of survival and development of micro and small wine companies, that have own rules and advantages which allow to stay in that upcoming craft. Micro and small companies is a major part of wine business in the Czech Republic. The purpose is to understand the specifics of wine marketing perception and find out which marketing tools most affect the success of the wine company within the framework of case study.

**Design/methodology/approach:** A brief comprehensive review of recent scientific literature and articles published predominantly in marketing oriented journals was carried out followed by a qualitative case study. The concerning research part has the form of a case study. There a survey was conducted, namely the face-to-face structured interviews, which belongs to the verbal form of questioning methods commonly employed in qualitative research. Open-ended questions were used in this study that is approach of grounded theory. The qualitative content analysis was carried out for analysing obtained data.

**Findings:** The research determines generalized understanding of wine marketing in the Czech Republic within micro and small wine companies from the theoretical and practical view. The most important and useful marketing tools were detected and confirmed by respondents' quotations in the framework of case study. This study shows that respondents basically understand the definition of "wine marketing" in narrow image as a mean of promotion. The main purposes and influence of wine marketing on the business success were discovered within the framework of conducted case study.

**Research/practical implications:** This study focuses on a creation of framework for further research for application wine marketing principals within the context of micro and small companies located in the South Moravian region in the Czech Republic. Results of the study are useful for both theorists and practitioners. Conclusions and that grounding can be as a platform for the development of further in-depth theoretical model of wine marketing. Representatives of the wine business might be interested in conducting a comparative analysis of the activity and the possible use of a well-functioning marketing tools.

**Originality/value:** This paper reflects the perception of selected wine marketing of wine business representatives in the South Moravia region in the Czech Republic. The admitted practical applications of wine marketing tools are equally beneficial.

**Keywords:** wine marketing, marketing tools, micro and small business, family business

**JEL Codes:** M3, L26, L66

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## **Introduction**

The current time can be called as turbulent time. People need a lot of information as soon as possible with help of modern technologies. Speed, dynamics, the latest technology- that all affects not only humans, but also companies. If people want something new, companies are forced to develop new products and technologies. Because nowadays, companies place a great emphasis on the relationship with the customer and the satisfaction of his needs. Furthermore, it is quite important to realize, that today the market is oversaturated by great variety of companies. Therefore, the market competition is high. A lot of micro and small companies terminate its activities, because they are overwhelmed by large companies. Each company should follow not only customer needs but although its competitiveness. It is relevant to find out companies' strengths and weaknesses. Based on that, company should focus on elimination of weaknesses. The company can form its image and direction of development based on competitive advantages. This is one of the functions and activities of marketing.

One of interesting area is viticulture and wine marketing. Because this is one of the oldest process, which has long reach history around the world. Marketing in wine area is particular and sophisticated. The vast majority of founders-winemakers across the world were small independent producers including in the central Europe, they had experienced a lot of economic, political and social posers (Bruwer, 2010), (Terblanche, 2008). These comprise modification worldwide production and consumption patterns, severe competition, notably from New World producers and rising control (Thomas, Painbéni, & Barton, 2013). Presently winemakers are divided into different groups according to business size, production, wine regions and etc. Based on that, marketing tools are different for various winemakers.

Consequently, perception of wine marketing and determination of basic marketing trends of the small wine business are main objectives of this study. Due to the lack of research in this field in the Czech Republic, we have focused on case study that represented several Czech small wine companies in South Moravia region. Czech wine industry is now part of industry which is rapidly developing and gaining momentum. It is particular part to the Czech wine industry given the significance of viticulture and winemaking for the agricultural economy of the Czech Republic, illustrated by 17,600 hectares of vineyards within the country with 18,500 registered grape growers (Rozbroj, 2014). According that context, this paper investigates how it is still probable for a micro and small companies to craft and growth sector in a successful industry through wine marketing (Jones, 2011) (Rozbroj, 2014).

## **1 Marketing in the wine industry**

### **1.1 Theoretical background**

Existing study on entrepreneurial marketing in the wine industry is limited. Nevertheless, the exploratory research on New Mexico winemakers as entrepreneurial marketers was carried out by Ray Chaudhury et al. (2014). This authors detected introductory maintenance for a few dimensions of entrepreneurial marketing. That detentions are pursuing opportunities, proactiveness and innovation, value creation via customer participation, and collaboration through the sharing of resources (Ray Chaudhury, 2014). Notwithstanding that, validated scale on the Entrepreneurial marketing dimensions has not been existed until in 2013 Fiore at al. extended previous research on entrepreneurial marketing by means of empirical study's presentation on the EM characteristics of North Carolina winemakers (G. D. Shows, 2016). This research is based on the qualitative work of Ray Chaudhury et al. (2014) by verifying through quantitative research the entrepreneurial characteristics of wine merchants, including their acceptance of innovation (idea seeking), and their partisanship to long term customer relationships (customer intensity) (G. D. Shows, 2016). According to conducted research, these two dimensions were detected to be positively related to the winery's satisfaction with performance. Moreover, authors found, that if wineries are more innovative (open to new ideas), so that "wineries were associated with a positive percentage sales change" (G. D. Shows, 2016). Although more value creation orientated wineries were associated with positively rewarded by consumers resulting in a positive change in sales (G. D. Shows, 2016).

Czech wine industry faces extremely competition as on national as on global level. Valid marketing is crucial for solving that issue (Thach, 2006). Wine consumers become more and more spoiled. Because they become more well-informed and penetrating over the years. One of the reason is growing social differentiation: "*older people from upper middle class or higher socio-economic groups increasingly consume a large proportion of the wine market.*" (Demoissier, 2011) That consumers prefer to buy limited quantities but orientate on quality so buy more expensive wines. As a result, there is a growing globally trend towards "*drinking less but better.*" (Mintel, 2010)

Wine market has not passed the increasing significance of product differentiation due to globalization, in spite of wine market is considered as a complex one for consumer decision making (Thomas, Painb ni, & Barton, 2013). In comparison with other mature industries, wine industry differentiation "*becomes the small winery's major opportunity.*" (Duquesnois &

Gurařu, 2010) Nevertheless, differentiation is already implemented in the Czech Republic via regional differentiation.

Giving the actual context within the Czech wine industry, the challenge for micro and small wine companies is therefore twofold: to defend current positioning through brand differentiation and the manipulation of product-market development opportunities.

## **1.2 Wine marketing perception: Case study from the Czech Republic**

A qualitative exploratory research was conducted in form of case study. The aim was to understand the specifics of wine marketing perception of selected Czech wine companies. The results allow to formulate research questions and hypothesis in the future. There was a set of six questions: 1. What is wine marketing from your point of view? What is its purpose? 2. What kinds of marketing tools do you use? 3. Do you think there is the connection between using of marketing tools and your business success? 4. Which marketing tolls do have a greater influence on success of your company? 5. Are you a family business? 6. Do you use name “family business” in a way to attract customers?

15 representative persons of wine business were asked to answer on the above-mentioned questions. The survey was conducted in September-October 2016. A prerequisite for being chosen was participations in historical folk wine festival “Slavnosti vína” in South Moravia Region in the Czech Republic as active representative of micro or small wine business. Choosing such representative for an interview was carried out randomly. From that 15 representatives only 7 answered a questions properly.

One of representative was an owner of wine business, two of them were family members of wine business owner, and four were well informed agents of representative wine businesses. All of them represent micro and small wine business with no more than 50 employees according to Amadeus database and confirmation of their own (Amadeus database, 2016).

Respondents: R1: Business agent of wine shops’ chain (Respondent A); R2: Family member of family wine business (Respondent B); R3: Agent of wine business (Respondent C); R4: Agent of wine family business (Respondent D); R5: Agent of wine family business (Respondent E); R6: Owner of wine family business (Respondent F); R7: Family member of wine family business (Respondent G).

There a survey was conducted, namely the personal face-to-face structured interviews, which belongs to the verbal form of questioning methods commonly employed in qualitative research. Open-ended questions were used in this study that is approach of grounded theory.

Recorded interviews were the earliest transcribed, printed and then analyzed. All response have been processed through qualitative content analysis in the following chapter.

## 2 Results

### 2.1 What is wine marketing and its purpose according to Czech wine business representatives?

A few regularities can be observed in wine marketing perception, based on the statements of respondents. *“This means propagation of products.”* (Respondent A) *“I would say, it contributes to products propagation”*. (Respondent F) *“It is demonstration that business makes qualitative wine and sell it for a reasonable price.”* (Respondent B) *“It is the toll to inform customers that we exist and where to find us.”* (Respondent G) *“Marketing needs to increase customer awareness about that products.”* (Respondent F) According to that respondents, the product propagation is a main feature of wine marketing. Therefore, they mentioned the tool to stimulate the organization of public opinion, to provide a benevolent fame for business and its products.

Respondents C and D reflect on the task of sales increasing in the wine marketing framework: *“Currently, we perceive wine marketing as a toll for increasing of sales”*. (Respondent C) *“Marketing is a set of tools, which can help to develop business, increase sales of wine and its distribution.”* (Respondent D) Respondent C although mentioned that wine marketing can aim for the dual purpose and gave the reasons: *“It can have bilateral aim: brand propagation or sales increase. Also there can be intersection between this objectives. I think, it depends on faze of business development.”* (Respondent C)

Demonstration the openness, honesty and company values as an instrument of wine marketing was summarized by participants: *“It is hard to explain, but I can argue that it is the tool by which I can show people what we do, what we offer to customers, how we make business, how we make wine with the soul.”* (Respondent E) *“It is way to express company values and allow people to differ us from big companies, show them that we are the same people who makes their job with love.”* (Respondent E) In discussion the first question- formulation wine marketing based on the respondents’ opinion, they mentioned that it is connected with the propagation of product and brand, for example, within increasing of customer awareness. Some of them make accent on making of association their products with good quality. The way they achieve increasing of wine sales is connected with application of marketing tools. The need of

company to present itself aboveboard and demonstrate intern motivation and advantages was mentioned by several respondents.

## **2.2 What kinds of marketing tools are used by representative of Czech wine business?**

According to all respondents, the self-presentation on different mass different fairs and festivals is the most popular tool to express yourself as a business and increase public awareness about your products. *“We always try to participate on such mass action as today.”* (Respondent A) *“In our company we use marketing tools in the framework of self-presentations at different fairs and festivals such as “Vinomania”, “Svatomartinský košt” etc.”* (Respondent B) *“Usually as a marketing tool for us is self-presentations on fairs and festivals.”* (Respondent D) *“We prefer self-presentations on similar actions as today “Slavnosti Vina.”* (Respondent F) *“Different mass action as today is also good mean for marketing.”* (Respondent G)

Although respondents A, D, G mentioned self-presentations on wine-degustation in some extern place or in their own wine shop. *“Our customers can find all needed information about us and our products in our wine shop.”* (Respondent A) *“We also understand presentation of our business and products in the wine shop as good marketing tool.”* (Respondent D) *“As marketing tool we can give an example as wine degustation, where customer can consume our products, ask questions and know us closer.”* (Respondent G)

When we look closer at the particular marketing tools focused on external presentation, our respondents mentioned the following option of print and outdoor advertising: *“On occasion we use printed advertising campaign before some competitions.”* (Respondent C) *“Sometimes we use also billboards.”* (Respondent A) *“We use outside billboards to attract new customers.”* (Respondent D) To enhance the ability to find and connect with the company, almost all our respondents commented presence on the Internet and using online advertising as an essential tools in today's time. They noticed that it help them to attract new customers and be in touch with regular customers, inform them about promotions, organizations, wine tastings. Many of them named Facebook as one of the most popular resource for information exchange: *“We are trying to use internet resource as a tool for increasing of customer awareness and communication with our customers. Currently I have been working on improving two-way communications with customers through Facebook.”* (Respondent A) *“Facebook page helps us to promote our product brand.”* (Respondent D) *“We think that Facebook and our web-page helps us to increase customer awareness and communicate with them.”* (Respondent F) *“We think that Facebook and our web-page helps us to increase customer awareness and communicate with them.”* (Respondent F) *“Facebook is a good mean for marketing.”*

(Respondent G) One of respondent referred about Facebook in following context: *“We do not have yet Facebook page, but in the future we plan to create account there.”* (Respondent B)

Broadcast advertising for one of respondents is a mean of pay attention on their product and preparing for some big events for one of the respondent. But that mean needs extra financings, thereby it is not regular tool: *“If we have extra money we can invest them to radio campaign.”* (Respondent C)

Respondents C and E notice that product design process is using in depth in their company. They pay attention on bottle label creation as a tool that sells the product: *“We pay great attention to bottle label, because it is orientation for customer. We try propagate our label. For example, my festival neighbor has not attractive, interesting label, thereby he does not have success today.”* (Respondent C)

Respondent E mentioned that only combination of marketing tools can help to achieve results: *“We use different methods to attract customers, for example, creating good bottle label, participations on various actions, also we use Facebook to facilitate ways to find us. Today's is modern technological times, so we need to use that communication methods that prefer our customers. It is necessary to use many of tools to reach your goal.”* (Respondent E)

The second question was aimed at particular tools of wine marketing which are used in the respondents' companies. All respondent identified advertising as a toll of wine marketing. They use online advertising via company web sites, social networks, particular Facebook. Some of them use radio, billboards and printed advertising before major events, where they participate. Mass events, such as fairs, festivals, and degustation were also mentioned as an ideal place for company self-presentation, where customers can become better acquainted. Several respondents noticed that bottle label pay first customer's attention, so that kind of not-verbal presentation is very crucial in product design process.

### **2.3 Does exist the connection between using of marketing tools and wine business success?**

*“Certainly we observe that connection”.* (Respondent A) *“Marketing tools' using increase our sales.”* (Respondent B) *“Of course, thanks to marketing, we created well-known brand on the wine market and enhance sales due to that famous brand.”* (Respondent C) *“Yes, we thank marketing allows us to attract new customers and their awareness about us grows.”* (Respondent D) *“Undoubtedly! Otherwise, it would be very difficult to let know about us, our company, our history and our products. Our goal is to convey to the end customer our idea of a good wine. We need to create a good vision of our product and the brand. We want to attract*

*the customer, let him taste our wine and pass information about us on friends. Although marketing let us increase our sales, of course. We try to sell the biggest part of our stock during festivals and other events. It works.”* (Respondent E) *“Yes, it exists. In this way, more and more people get informed about us. Usually we sell everything what we prepared in similar event as today, so I can claim that it helps us to increase sales.”* (Respondent F) *“I would say, yes.”* (Respondent G)

In this third question it was examined whether the companies, where our respondents work observe the connection between using of marketing tools and their business success. All of them responded positively. The most common answer was that marketing contributes to increase company's sales. For several respondents event marketing is a tool, where they can sell impressive part of the products' stock. Some respondents mentioned that sales' increasing was a result of brand popularization after marketing tools' use. The majority of respondents indicated that marketing facilitates company to introduce itself and get in touch with customers. Thereby companies increase customer awareness about them, their brand and products.

#### **2.4 Which marketing tools do have a greater influence on wine company success?**

For almost all respondents key marketing tool which positively affects the business success is self-presentations where is closer contact with final customers: *“I think the best way to propagate our wines is participations in different events. I would name wine festivals such as “Svatomartinský košť” and “Slavnosti vína” as the most affecting our company prosperity.”* (Respondent A) *“The wine festival “Slavnosti vína” has a greater influence on our success.”* (Respondent B) *“Different event help us to introduce us and find new customers, sell them our wines.”* (Respondent D) *“For us the most significant marketing tool is self-presentation on such mass events. Because we are small company, we cannot allow to be a part of big chain shops and gas stations. We do not need further several sellers who will raise the final price in several times. Our business will never have such manager, who will be in the big shop and sell our wine for whole republic, we do not capacity for that. We understand the marketing in different way, we need to get to the endless customer, to be in contact with customers, who taste our wine. Our company orientates on such customers, who do not search some exclusive Italian or Moldavian wines. We orientate on people, who want local Moravian wine, who search for winery, which independently produces wine and sell it to final customer.”* (Respondent E) *“The biggest results we observe after participations in wine festivals and fairs.”* (Respondent F) *“Show impacts on our success. That means, we try to make show everywhere, present ourselves as better as possible. Decorations, national costumes, traditional wine customs help us attract*

*customers and increase our sales. Usually we use that kind of self-advertising on presentations, fairs and festivals.”* (Respondent G) Respondent F added that such kind of event as “open cellars”, where customers can look deeper to business history and become better acquainted, also influences on their success. *“Moreover, we see that “open cellars” play important role, that marketing event influent on company’s success.”* (Respondent F)

Thereby, that respondents claim that the biggest impact of their success is due to self-presentations on various events. It can be reason that small wine businesses are not able and willing to put their products on the shelves of large retail chains, they aim on final customer. Besides that, such festivals and fairs allow small wine business representative sell a majority of their stock and avoid additional extra investment in propagation.

Respondent A notes one more useful tool for their company, where they can present themselves and directly communicate with customer: *“Propagation of our wines in the wine shops is more productive than advertising on Internet, particularly on Facebook.”*

Respondent C is sure that product design process, especially creating expressive, sapid and memorable bottle label, has the greatest effect on wine business success: *“First of all, the bottle label, as I mentioned, is the crucial for wine business. We see a customers’ reaction on our bottle, they like it, the label magnetizes them. Thereby, they want to try our wine and after you can offer them to look at your web-page, follow you on Facebook. So first is the label after we use other tools.”*

Advertising on Internet, especially on Facebook, impact on business success according to respondent D. Thereby, customers have convenient instrument with which they can follow actual information about the company and its plans: *“Facebook also plays important role for us, our customers find us by name and share different information to their friends.”* (Respondent D)

According to Viana (2016) the use of marketing tools affects sales. Factor number one as a reason people buy wine is based on recommendations and testimonials, revealing the bloggers, digital magazines and social media.

## **2.5 Do wine business use name “family business” as a marketing tool?**

According conducted interviews, from 7 respondents only 5 were representative of wine family business. Their answers are following: *“Of course, we use name “family winery” because it is true, and we are proud of it!”* (Respondent B) *“Yes, we are family business, so we put this name and on our bottle to show people that we are the same usual people as they are.”* (Respondent D) *“We use that name, because today in the Czech Republic people do not keep track of the*

*company size. Because big wine companies orientate on quantity and forget about quality. That situation cannot be in small wine business. "Family business" name is based on true, because our family make that wine for 60 years from generation to generation.*" (Respondent E) *"No, we do not use that. But if customer asks we tell him that whole family participate in winemaking process."* (Respondent F) *"Certainly we use that name everywhere. We write it on our bottle's label, leaflets and web-page."* (Respondent G)

As it can be seen according to answers, all respondents, who represent family companies, use the name "family business" to attract customers. The reason is that customers associate family company with a company, which focuses on quality and not on quantity. Companies try to demonstrate that their worker are on the same wavelength as their customers.

## **Conclusion**

Wine accompanies human since the beginning of his existence. Wine for many cultures is important commodity and its importance did not lose over the centuries. But today on wine market there is an incredible variety of wine which can put the customer in a difficult position. Moreover, wine producing and selling companies have not less issues. Wine industry is complicated and high competitive. A lot of external uncontrolled factors influence the wine company, especially legislative, political and natural factors, such as unpredictable weather. Nevertheless, micro and small wine companies still alive and developing, they have own rules and advantages, that allow to stay in craft and growth sector in a successful industry. According to literature, one of the reason is the using wine marketing (Jones, 2011) (Rozbroj, 2014).

The mission of that research was to create basic foundation for future research in the field of application wine marketing principals within the context of micro and small companies enabled in the South Moravian region of the Czech Republic. By process of acquired research results, it is able to explain practical understanding of this theme.

Case study based on open-questions interviews has shown that almost all respondents understand wine marketing as mean of promotion. They associate advertising as the main marketing tool. The purpose of wine marketing, according to respondents, to enhance customer awareness about the company, brand and product. Although one of the aim of wine marketing for respondents is increasing of wine sales. Several respondents mentioned that demonstration of intern motivation and advantages of the company and its products is way of good marketing approach. As a tool of wine marketing all respondents noted self-presentation on different events, they claimed such kinds of participation allows customers become better acquainted.

As a not-verbal presentation some represents mentioned bottle label, which pay first customer's attention. Representors said that they use online advertising through company web sites, social networks, particular Facebook. Several use radio, billboards and printed advertising before major events, where they participate. Interesting results occurred during respondents' answers analyzing: all respondents maintain that there is a connection between using of marketing tools and their business success. The majority noted increasing of company's sales as a result of marketing contribution. Interesting remark was made by one of respondents, that increasing of their sales was based on growth of brand awareness and only after company was capable to enlarge its sales. Although it was noted that event marketing allows companies to sell meaningful part of the products' stock and contributes to introduce itself and get acquainted with customers. Thereby, customer awareness about them, their brand and products is increasing. One of the research goal was to investigate which marketing tools have a greater impact on wine companies' success. According to research results, key marketing tool for wine companies is event marketing, particularly self-presentations where contact between the company and customer is maximal. The reason is that small companies cannot afford to be a part of supermarket chain's supply. Small wine companies intend to reach the final customer who deliberately chooses a local producer, associating it with the reliability and quality, thus is showing customer's confidence in that company. Product design process, especially creating expressive, sapid and memorable bottle label has the greatest effect on wine business success according to several respondents. Because the customer has a motley diversity of wine producers on the market and one of the basic elements of customer orientation in that manifold is budding, decoying bottle label. Thereby, it makes sense to pay attention on that kind of not-verbal presentation. As one of the most affecting marketing tools on business success, was mention online advertising, especially on Facebook. It is connected with that some respondents founded on affirmation that today the company needs to follow modern ways to communications with customers and use that kinds of which are convenient for customers.

Customer satisfaction is basic word of any company today. That is the key for success. Micro and small wine companies are not exceptions to that rule. During the interviews the phrase as "satisfied customer" was mention oftentimes. They claim if the customer is satisfied, he demonstrates brand loyalty and in the next purchase will reach the same wine brand. On the wine market is high competitiveness, thereby, if customer is not satisfied by purchase, it can be cause of purchase of the different brand.

Looking close to research results, it can be perceived that there is a positive future of micro and small wine companies' development. First of all, according to this research,

customers support local producer basing on internal convictions associating small wine companies with reliability and quality. But the most sapid investigation is confirmation that information by wine companies' representative. Micro and small wine companies distinguish themselves from big wine companies by mean of quality orientation and inserting souls into production. Besides that, micro and small wine companies orientate to final customers, they want to be in close contact with them.

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## ENVIRONMENTAL RESPONSIBILITY IN MARKETING ACTIVITIES OF COMPANIES

Zdenka Musová – Hussam Musa

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### Abstract

**Purpose:** Current negative course of events in the environment influences the activities of companies, as well as the behaviour of consumers. Companies are forced to take these trends into account also in the marketing activities. Consumers also treat the environment with higher responsibility. The behaviour of companies and consumers is closely connected. Consumers, while they are making purchase decisions, react to various stimuli from the external environment, including marketing stimuli of companies. In that context, the aim is to define the environmental marketing and examine consumer perception of it with an emphasis on particular tools of marketing mix.

**Design/methodology/approach:** Secondary data analysis is supplemented by selected results of the preliminary questionnaire survey from March 2016, through which we determined whether the environmental efforts of companies have a sense of consumers and whether consumers are adequately responding to them. Structured questionnaire was designed to elicit responses about the effects of various environmental marketing tools on consumer purchase behaviour and its perception from 420 respondents from the Slovak Republic.

**Findings:** The selected outcomes of the preliminary questionnaire survey focused on examination of consumers' environmental behaviour and reactions to environmental initiatives of companies are presented. We found out that the environmental awareness of our respondents is low. They recognize environmental activities of companies only partially and they rarely take them into consideration when making buying decisions. This reality may seem discouraging for the environmentally oriented companies and may lead to less responsible behaviour of them in the field of environmental protection.

**Research/practical implications:** Rising concerns about our planet's future mobilize all market participants towards active protection as well as the removal of existing damage. Responsible marketing managers, who assess all their decisions with respect to the environmental impact, are no exception. We summarize the basic recommendations for companies focused on improvement of their behaviour concerning creation of an environmental marketing mix respecting needs and desires of the developing segment of environmentally responsible consumers. The achieved results will be the basis for a more detailed examination of the issues for the subsequent representative research.

**Originality/value:** The results of our survey confirmed that responsibility for solving current long-run environmental problems must be taken not only by the companies but also by consumers themselves. If behaviour of both partners is responsible, the relationship will be beneficial for both market participants. This paper fulfils a need for advancing knowledge on implementation of environmental responsibility in marketing activities and provides a practical framework for responsible and environmentally-friendly (marketing) managers.

**Keywords:** environmental marketing, environmental marketing mix, consumers' perception

**JEL Codes:** M14, M31

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## **Introduction**

Increasing concerns about the planet's future of the planet mobilize people towards activating their approach to environmental protection and elimination of the damage caused. Simultaneously it is motivation for companies to deal with these problems and to implement environmental considerations into their corporate strategies. Issue of pollution and environmental protection are important to such extent that they are considered by marketing managers too. Environmentally responsible marketing managers consider every single decision also from the point of view of its impact on the environment. This implies mainly application of environmental marketing tools within which the environmental responsibility is a part of all marketing decisions through all phases of the product life cycle – beginning with its development, through its market placement, possible utilization, up to eventual disposal after the end of its lifetime.

### **1 Theoretical background**

Although the environmental problems have been significantly deepening in past decades and many of them has acquired a global character, their solution was not often awarded by adequate attention. Marketing and management were initially criticized for its incompatibility with the "green" issues because they suggest methods and approaches that meet the needs of consumers and maximize business profits, they do this at the expense of the environment (Levy, Zaltman, 1975; Peattie, 2001). Nowadays, both disciplines are yet considered as an integral part of the solution to environmental problems. Supporters of environmentalism have been striving for a long time to ensure the objective of marketing systems to be not only to increase consumption, greater choices and richer supply for customers, but rather the increase of the quality of life, especially the quality of the environment (Poliacikova, 2007).

First works dealing with these issues are coming from Kotler and Levy (1969) who first introduced the concept of social marketing management. Their "pioneering" article subsequently encouraged the exploration of environmental issues within the topics as "social marketing" (Lavidge, 1970) or "social responsibility and marketing" (Kotler, Zaltman, 1971). Most of these efforts were subjected to criticism of the moral role of marketing in the society and contributed to changing general definition of marketing in order to be reflecting greater sensitivity to environmental issues (Crane, Desmond, 2002).

From the point of view of marketing marketing, which takes into account the environmental criteria, terms "green", "ecological", "environmental" and "eco marketing" are

interchangeable. Nowadays, we can meet with different definitions of environmental marketing. Based on the definitions of marketing in general and definitions of environmental marketing introduced by various authors (e.g. Peattie, 2001; Majerova, 2015) we can define environmental marketing as a process of planning, implementation and control of product development, pricing, marketing communication of a product and its distribution (including take-back and disposal, respectively recycling) while customer needs are satisfied, the company achieves its objective and all processes are environmentally compatible with the ecosystem.

Environmental product is considered to be crucial tool from all marketing tools. Product is often the cause of the environment pollution, but it can also be the tool reducing the negative impact on the environment. It's defined as a product with positive impact on the environment and natural resources through the entire product life cycle. It is a quality product with a long lifespan, made of non-toxic materials with the use of energetically effective production processes and supply, packaged in as little recyclable material as possible, not being tested on animals (Miklencicova, 2016).

Price of environmental product is usually higher than the price of their environmentally less suitable substitutes. Respecting the requirements of environmental protection leads, on one hand, to increasing of company's costs (higher costs on research and development, new sustainable raw materials and energy resources). On the other hand, these increased costs can be offset by savings from lower material and energy consumption, package reduction and lower disposal costs.

An important corporate marketing decision is the selection of environmentally suitable distribution of a product, by keeping the basic principle of optimizing the amount of transported goods, reducing the distance between production, storage and trade, selecting of appropriate transport modes and vehicles, that reduce burden on the territory as much as possible, and that are safe in terms of risk prevention in accidents. The important role in physical distribution plays the development of environmental transport and removal systems, and green logistics (Mala, Musova, 2015).

The role of environmental communication policy is to support the consumption of environmental products and to create a public awareness of the need for environmental protection. Just comprehensively and truthfully informed consumer is inclined to buy environmental products.

## **2 Environmental marketing stimuli and consumer behaviour**

Every consumer is making purchase decisions through which the meets personal needs and wishes almost on a daily basis. Today's consumer holds an important position in the market. His sovereignty increases and he has a great choice from a wide range of product offer. Factors and influences motivating consumers to make purchase decisions, create a large complex and it is not easy to understand them. In the classical model of motives and reactions are marketing initiatives in the form of marketing tools of great importance.

We assume that properly compiled marketing mix with the environmental dimension should represent an adequate response to the needs and desires of consumers and should consider as much aspects of their decision-making process as possible. Companies can significantly influence behaviour and choices of consumer by a socially responsible environmental behaviour, as well as offer of environmental products and other marketing tools. In the final consideration they are the consumers, who decide whether and how they will react to these suggestions. Based on these assumptions, we just saw a great opportunity in exploring the reactions of consumers to environmental impulses of companies. Our effort was to determine whether consumers register environmental marketing behaviour of companies, how much attention they devote to this behaviour and whether they evaluate such behaviour sufficiently (e.g. by preferring environmental products).

### **2.1 Methodology of survey**

Preliminary questionnaire survey presented the first phase of a broad research focused on the research of environmental responsibility of selected market subjects. The subjects of our survey were randomly asked consumers in Slovakia. Our aim was to have equal groups of respondents in terms of gender. The age structure of the sample based on life cycle stages (young people/students, young couples forming families, full nests, empty nests). After the verification of questionnaires, 420 respondents could be included in the survey sample. Respondents were asked mainly by email and social networks (in March 2016), and a part of them were approached personally (respondents of older age categories).

While constructing the questionnaire, we have taken into account the results of the analysis of secondary data. The questionnaire had three parts – general part (questions were focused on determining the interest of consumers about the environment and their environmental responsibility). The second, key part aimed to determine the influence of various environmental factors (including the influence of marketing tools) on purchase behaviour of

consumers. The last part of the questionnaire served to find out socio-demographic information about the respondents. Various types of questions were utilized, mainly closed questions (simple, multiple choice), open questions and scaling questions.

Considering the aim of our research was to determine the baseline situation for the needs of the following, more detailed research (data collection is currently undergoing), we have not focused on achieving representative results. During the evaluation and analysis of our findings, we have only used basic methods of statistical processing (descriptive statistics) and Chi-Square Test. In the following part, we will present only selected relevant results.

## 2.2 Selected results of survey

In the first (general) part of survey we were interested in consumer attitudes towards environmental issues. Despite of often great interest of consumer in the issue (and their positioning as an environmentally responsible) only a small proportion of their attitudes is transformed into effective demand. This fact was confirmed also in our survey – most of respondents (42%) occupied so-called selective approach (they manifest environmental responsibility in some activities or while purchasing). Up to 26% reflected insufficient interest in solving environmental problems. Only 9% of our respondents expressed an active approach to these issues. We were interested in the fact, if environmental attitudes of our respondents are connected with their gender and age. The verification of our hypothesis (null hypothesis  $H_0$ : There is not a relationship between the consumer attitudes to environmental issues and the gender of respondent; alternative hypothesis  $H_1$ : There is a relationship between the consumer attitudes and gender of respondent) was based on the Chi-Square Test usage. The Chi-Square was calculated through [www.socscistatistics.com](http://www.socscistatistics.com); resulting value is 17,617; the  $p$ -value is .001466 (Table 1). The  $p$ -value is less than the significance level (0,05), we cannot accept the null hypothesis. Thus, we conclude that there is a relationship between environmental attitudes of respondents of our survey and their gender.

**Tab. 1: Consumer attitudes towards environmental issues (gender)**

	Male	Female	<i>Row Totals</i>
Active approach	17 (19.00) [0.21]	21 (19.00) [0.21]	38
Financial support	37 (27.50) [3.28]	18 (27.50) [3.28]	55
Selective approach	74 (88.00) [2.23]	102 (88.00) [2.23]	176
Insufficient interest	53 (54.50) [0.04]	56 (54.50) [0.04]	109
No interest	29 (21.00) [3.05]	13 (21.00) [3.05]	42
<b>Column Totals</b>	210	210	<b>420 (Grand Total)</b>

Source: Own collaboration based on survey results and <http://www.socscistatistics.com/tests/chisquare2/>

The similar method we used to verify the null hypothesis related environmental attitudes of consumers in our survey and their age ( $H_0$ : Consumer environmental attitudes and the age of respondents are independent; alternative hypothesis  $H_1$ : Consumer environmental attitudes and the age of respondents are not independent.). Chi-Square statistic is 74.1432, the  $p$ -value is  $< 0.00001$ . The null hypothesis is rejected and we accept the alternative hypothesis  $H_1$  at the significance level of 0,05 – variables of interest are in relationship (Table 2).

**Tab. 2: Consumer attitudes towards environmental issues (age)**

	18 - 26	27 - 35	36 - 49	50 +	<i>Row Totals</i>
Active approach	9 (13.30) [1.39]	12 (8.78) [1.18]	15 (10.68) [1.75]	2 (5.25) [2.01]	38
Financial support	5 (19.25) [10.55]	17 (12.70) [1.45]	29 (15.45) [11.88]	4 (7.60) [1.70]	55
Selective approach	80 (61.60) [5.50]	31 (40.65) [2.29]	51 (49.45) [0.05]	14 (24.30) [4.37]	176
Insufficient interest	43 (38.15) [0.62]	26 (25.17) [0.03]	17 (30.62) [6.06]	23 (15.05) [4.20]	109
No interest	10 (14.70) [1.50]	11 (9.70) [0.17]	6 (11.80) [2.85]	15 (5.80) [14.59]	42
<b>Column Totals</b>	147	97	118	58	<b>420 (Grand Total)</b>

Source: Own collaboration based on survey results and <http://www.socscistatistics.com/tests/chisquare2/>

Subsequently we focused on finding whether and how much attention consumers devote to environmental impacts in their purchases. They mostly expressed that they devote a very little or no importance to this factor. Based on the answers of respondents we identified especially low living standard of some respondents, lack of information about this issue and in more of cases the indifference of consumers as the reasons for "non-environmental" behaviour.

In the main part of survey, we focused our attention on consumer perception of the environmental aspects of individual tools of marketing mix. In product respondents pay significant attention to raw materials (almost 72% of respondents) and package materials (36%), but they pay much less attention, for example, to ways of product disposal (14%) when purchasing food. Consumers pay less attention to environmental factors, when buying cosmetics and toiletries, and even less attention to durable products (in this case they are more interested in energy consumption and energy-saving options for).

The part of environmental product's differentiation is also their eco-labelling. The best known labelling for our respondents was the label of "Bio product" (64%), the least known label was "European Flower" (8,7% of respondents). Almost 18% of respondents have not met yet with any environmental label, respectively they did not notice it.

The higher price of environmental goods may indicate a certain competitive disadvantage. A willingness to replace previously used product for environmentally suitable one (assuming also more expensive) represented one of the interesting environmental attitudes of respondents. According to their opinion, the price should not be higher by more than 5% compared to the price of originally used product (this and lower value was always reported by approximately about 80% of respondents of different age groups). Respondents were able to “sacrifice” a slightly higher price when purchasing electronics and automobiles (from 5 to 10 percent increase in prices).

Unfortunately, respondents paid very low attention to the product distribution. Only 17% of respondents were interested in that what way the product passed from producers to their households. The paradox is that approximately 24% of the respondents were interested in the way of product distribution, but they prefer products from (distant) abroad because it is cheaper compared to domestic (local) products.

The results of survey showed that one of the main barriers in purchasing of environmental products is insufficient information and communication. There exist certain groups of consumers who would incline to buying environmental products if they are more informed, but due to low propagation they do not have sufficient impulse to buy. Our respondents usually gained most of information about environmental issues from TV (more than 41%) and the Internet (33%). They attributed lower importance to print media (less than 25%). We were surprised by lower interest of gaining information from personal sources – just 18% (although in general, the personal sources of information are considered to be one of the most credible). The importance of digital marketing is increasing (Svec et al., 2015).

From the results of our primary investigation it was concluded that although many companies try to behave environmentally (and they are aware of the potential benefits of such behaviour), their environmental marketing initiatives remain without an adequate response. We cannot generalize to the whole consumer public due to the fact that, on the market place there are on one hand segments of strong environmental feeling, on the other hand, there are also segments whose members are completely indifferent to environmental issues. These findings may seem discouraging to eco-oriented companies. They might discourage them from the implementation of environmental activities and could lead to less responsible corporate behaviour in the field of environmental protection. On the other hand, we see a great opportunity of responsible corporate behaviour increasing consumer awareness about issues of environmental protection and this contributing to increasing their responsibility.

### 3 Recommendation for the creation of environmental marketing mix

In our conditions, we quite often meet with such market behaviour of companies that is not appropriate and ethical in relation to the environment and its protection. Based on the results of our preliminary research we summarize general recommendations for companies for the creation an effective marketing mix with environmental dimension.

Quality and safe **product**, corresponding to the requirements of consumers, made of premium materials, should be a matter of course for every producer (or seller). Nowadays it is substantial to plan the entire product life-cycle with respect to environmental requirements. When making decisions about a product, we consider following areas as principal:

- product safety (sufficient amount of information about its correct and safe utilization),
- truthful information about product (correct labelling, country of origin, content and composition of product, the way of using, maintaining and possible disposing of product) and
- environmental impact of product (his influence within various stages of life cycle, material and energy consumption of product, the package used and possibilities of its recycling, influence of product on waste production etc.).

The **price** of environmental product is particularly significant with respect to prevailing price orientation of our consumers. Although, research indicated that selected part of consumers is willing to accept higher price for products with environmental characteristics, such price have to be settled in terms of costs incurred as well as it have to consider consumer perceptions of price and imaginary "price ceiling" which consumers are willing to pay.

In the case of **distribution** of environmental products seems direct distribution as appropriate solution. The advantage is the expert advice "from the first-hand". For classical retail sales, it is important to pay attention to proper location and indication of environmental goods on shelves, they are not lost in the wide range of offered products. In the case of products of ecological farming, organic food and natural cosmetics it was proven that establishing specialized stores is a good idea. We recommend also to offer environmental products in online stores due to the positive effects of this type of sales on the environment.

The selection of target market and communication method is an important issue when preparing **marketing communication** of environmental products. The survey confirmed higher environmental awareness of young people with higher education and average or higher income. Current and less expensive way of presenting environmental product is advertising on the Internet and social networks. The most effective way of sale remains personal sale. Sales promotion is suitable for introducing new environmental products on the market. Of course,

good public relations that can positively contribute to the creation and promotion of environmental awareness of consumers are very important for responsible businesses as well.

## **Conclusion**

Negative trends in natural environment also affect marketing decision making of those companies (but not only) using natural resources as inputs for business activities. Many of them are aware of this fact and therefore complement its entrepreneurial approach with environmental dimension. In terms of marketing, this predominantly means utilizing the tools of environmental marketing.

When examining the possibilities of its utilization in practice, we assumed that responsible company address consumers with "environmental" offers and consumers react to them differently. According to the research results, we can conclude that the environmental impact is not one of the most important factors influencing consumer purchase behaviour in our conditions. Although many companies try to behave environmentally responsibly their marketing initiatives often remain without adequate response from consumers. Naturally, it depends on the environmental orientation of served consumer segments (from enthusiastic to completely indifferent ones). Nevertheless, we see a great opportunity of environmental behaviour of companies in shifting consumer behaviour towards better and sustainable future.

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## EARLY AND FAST INTERNATIONALISATION OF HIGH-TECH START-UP FIRMS

**Michael Neubert – Augustinus (Stijn) van der Krogt**

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### **Abstract**

**Purpose:** This paper analyses the research problem of the significance of early and fast internationalisation and how and why high-tech start-up firms (HSFs) from small and open economies (SMOPECs) differ in their internationalisation speed. For this purpose, the paper samples Switzerland as a developed economy and Paraguay as an emerging economy. This paper is based on the conceptual framework of the ‘born global firm’ (BGF) theory and the reviewed and updated Uppsala internationalisation process model.

**Design/methodology/approach:** The research questions will be answered using a comparative multiple case study research design. Data will be collected through multiple sources of evidence, including semi-structured, in-depth, individual face-to-face interviews with subject-matter experts (SMEs), field notes, corporate brochures, business plans and reviews, culminating in a reflection of the data collected. After drawing a random sample from a database of Swiss and Paraguayan HSFs, some typical cases are selected. The Swiss (Paraguayan) sub-sample comprises 20 (12) SMEs who are CxOs, owners and founders. These people have expertise and knowledge as entrepreneurs and managers in technology management as well as fundraising.

**Findings:** The results of the research reveal that the speed of internalisation is influenced by factors such as the skills of an entrepreneur and the management team, their international networking and learning skills, the business model and the pricing strategies of the HSF, market selection, the market entry mode, the successful implementation of a structured market-development process, uniqueness of the technology and the product portfolio, availability of market opportunities and the size of the home market. Furthermore, the results show significant differences between HSFs from developed and emerging SMOPECs concerning the importance of these factors for early and fast internationalisation.

**Research/practical implications:** The implications for practice, applications and consequences are identified. The outcomes will support policy makers, educators, investors as well as founders and managers to identify the respective key success factors for successful internationalisation and provide the required resources, including capital, processes and know-how. Future research can analyse the effect of location in cross-national studies with additional emerging and developed SMOPECs.

**Originality/value:** The findings of this qualitative multiple case study research project contribute to the field of research on international entrepreneurship because they will help researchers to better understand the significance of early and fast internationalisation and how and why HSFs from emerging and developed SMOPECs differ in their speed of internationalisation. In addition, the findings contribute to managerial practice because they will help managers and founders of HSFs from emerging and developed SMOPECs to develop new foreign markets earlier and faster.

**Keywords:** International entrepreneurship, Early and fast internationalisation, Born global, High-tech firm

**JEL Codes:** M13, M16, M31

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## **Introduction**

Early and fast internationalisation of high-tech start-up firms (HSFs), particularly in the sense of born global firms (BGFs) (Cavusgil & Knight, 2015) from different countries (Neubert, 2016b), is a matter that has attracted growing attention in international entrepreneurship, and yet, is among the least researched (Neubert, 2015).

A BGF that internationalises early and fast is often an HSF with innovative products operating as pioneers in a small global market niche (Neubert, 2015). It has a higher probability of being located in a small and open economy (SMOPEC) with a limited home market (Luostarinen & Gabrielsson, 2006). Consequently, a BGF from a SMOPEC is generally forced to internationalise early and fast to become profitable (Neubert, 2016a). This is very challenging for entrepreneurs and requires specific abilities. In parallel with this as well as limited resources, the entrepreneur builds the BGF, continues to develop its patent-protected products and enters new foreign markets (Cavusgil & Knight, 2015; Neubert, 2016b). Early and fast internationalisation of a BGF is considered entrepreneurial and risk-seeking (Oviatt & McDougall, 2005). It is often associated with the ability, experience and willingness of the entrepreneur, who might have gone through the first phases of the Uppsala internationalisation process model (Johanson & Vahlne, 2009) before founding the BGF.

This study responds to a call for research from Neubert (2016b) to analyse the effect of location in a cross-national multiple case study with BGFs from different SMOPECs. Therefore, this study analyses the research problem of the significance of early and fast internationalisation and how and why BGFs from SMOPECs differ in their speed of internationalisation, using Switzerland and Paraguay as a developed and as an emerging economy, respectively.

## **1 Literature Review and Theoretical Framework**

This study is based on the conceptual framework of the BGF theory (Cavusgil & Knight, 2015) and the reviewed and updated Uppsala internationalisation process model (Johanson & Vahlne, 2009).

### **1.1 Uppsala internationalisation process model**

In 1977, Johanson and Vahlne (2009) developed the Uppsala internationalisation process model. Their foremost finding was that firms enter new foreign markets using a so-called establishment chain. In the first step of this gradual internationalisation process, firms enter

geographically and culturally closer markets with low-risk market entry modes, such as ‘export’, ‘licensing’ or ‘franchising’ in collaboration with a local partner (Neubert, 2016b). With growing international success and market knowledge, they increase their investments, first establishing, for example, a wholly-owned subsidiary, and gradually begin to enter more distant foreign markets. Certainly, if market attractiveness decreases, the level of resources dedicated to a foreign market might also decrease, leading to outcomes such as a market exit (Neubert, 2013). Per this framework, Paraguayan firms are expected to enter (geographically and culturally closer) foreign markets like Bolivia and Brazil before they export to the European Union and Swiss firms predominately export to neighbouring EU member states like Germany, Austria, France or Italy.

The second finding is related to the liability of foreignness and outsidership. Firms need a firm-specific advantage (FSA) in every new foreign market to compensate for the liability of being a new foreign firm without a client portfolio, a support network to create market opportunities, or sufficient market knowledge. The larger the geographical, administrative, economical and cultural distance between the home and the foreign market, the larger is the liability of foreignness and outsidership, and the bigger the FSA needs to be (Johanson & Vahlne, 2009). Local partners, such as distributors or resellers, help to bridge these differences. The speed of internationalisation depends on the speed of learning (Johanson & Vahlne, 2009) about every new foreign market. This means that the firm must be able to transfer its FSA to a sustainable and relevant competitive advantage in every new foreign market to cover the cost (the liability of foreignness and outsidership) (Johanson & Vahlne, 2009).

## **1.2 A new type of firm—the born global firm**

According to Johanson & Vahlne (2009), the Uppsala model can also be applied to firms that begin to internationalise soon after their founding (BGFs) (Cavusgil & Knight, 2015) because these firms select foreign markets where they can enter fast and use low risk and low cost market entry modes such as exporting. Both of these (selection of market and mode) might be regarded as the first step of the establishment chain of the Uppsala model (Johanson & Vahlne, 2009).

Most empirical research on early and fast internationalisation focuses on HSFs in the sense of BGFs (Servantie, Cabrol, Guieu, & Boissin, 2016). A BGF (Cavusgil & Knight, 2015; Knight & Liesch, 2016) is a young firm that is active through early export sales. Thus, the BGF concept focuses on a market-seeking internationalisation strategy that uses, for example, a global exporter internationalisation model (Neubert, 2013). This is the link with the establishment chain of the Uppsala internationalisation process model (Johanson & Vahlne,

2009). Both the concepts focus on the market entry mode of ‘export’ as the first step to enter a new foreign market. Further, the word ‘global’ in BGF should not be understood in the sense that a BGF exports immediately to all global markets. Often, the BGF starts exporting to a limited number of the most attractive markets or to a particular region such as a free-trade area (Coviello, 2015).

A BGF needs to be distinguished from an international new venture (INV). The concept of INV (Oviatt & McDougall, 2005) analyses all international value chain activities of a young firm including not only exporting but also offshoring, outsourcing, R&D, production and sourcing. Thus, the terms BGF and INV cannot be used synonymously (Coviello, 2015).

### **1.3 Effect of location on early and fast internationalisation**

The effect of location on early and fast internationalisation has gained more attention among researchers (Knight & Liesch, 2016; Hitt, Li, & Xu, 2016) because findings from studies that analyse the fast and early internationalisation of high-tech firms from developed economies are not necessarily transferable to emerging economies (Zander, McDougall-Covin, & Rose, 2015). To date, there is little research on BGFs from emerging economies (Gonzalez-Perez, Manotas, & Ciravegna, 2016). The existing studies of Ciravegna, Lopez, & Kundu, 2014 emphasise the importance of social networks—particularly, the networking ability of an entrepreneur as a driver of the speed of internationalisation. Hitt et al. (2016) and Zucchella et al. (2016) reported that the reputation of the home country and the quality of institutions in that country also influence early and fast internationalisation.

## **2 Research Methodology**

The purpose of this study has brought up the following three research questions:

- Research Question 1: What are the perceptions of subject-matter experts (SMEs) regarding the significance of early and fast internationalisation for high-tech firms?
- Research Question 2: What are the views of SMEs regarding how high-tech firms may differ in their speed of internationalisation?
- Research Question 3: What are the opinions of SMEs about why high-tech firms may differ in their speed of internationalisation?

The choice of research method is based on the purpose of this study. This study uses a comparative cross-national multiple case study research design to answer the explanatory research questions (Yin, 2015). In contrast to an experimental design or a survey, a multiple

case study has more flexibility, allows an in-depth analysis of a complex research problem (Yin, 2015) within a highly contextualised environment and also allows for a comparison between different cases and countries. This research design helps answer the research questions because it allows the use of the replication logic as a possibility to obtain external and internal validity as well as in analysing pattern-matching properties between theories and cases (Yin, 2015).

This study used different sources of evidence to obtain robust conclusions and to achieve construct validity. Therefore, we applied the triangulation concept to the data collection phase to guarantee that different sources of evidence were used to collect data from each case. The primary source for data collection comprised qualitative, semi-structured, in-depth, individual face-to-face interviews with SMEs. Other sources of evidence were the corporate website, product and firm brochures, internal documents provided by the SMEs and other secondary data. The data of the Swiss sample was collected in July and August 2015 and that of the Paraguayan sample was collected in October and November 2016. The reliability criteria were met by using the same questionnaire, the same study protocol and the same data structure in the data collection phase. The duration of the SME interviews was between 60–90 minutes.

The data analysis followed a logical sequence, starting with an individual case analysis, followed by a cross comparison to identify similarities and differences and finally a literal and theoretical replication using a pattern-matching approach. The goal of this approach is to increase the possibility to transfer and generalise the findings to other contexts.

The choice of the sampling strategy is based on the purpose of this study that uses a purposive case selection strategy. After drawing a random sample (probability sampling) from a database of Swiss and Paraguayan HSFs, typical cases of the sample were selected. According to Yin (2015), if at least 6 to 10 cases are selected, this sampling strategy produces a statistically representative sample. Data saturation was achieved after 20 Swiss and 12 Paraguayan SME interviews. This sample size allows for a better triangulation of data and helps to strengthen the results of the whole study (Yin, 2015).

### **3 Findings**

The findings of this comparative cross-national multiple case study are presented to answer the research questions. The analysis of the data collected from the in-depth, semi-structured, qualitative, individual face-to-face SME interviews revealed the following similarities and differences between the significance of early and fast internationalisation and the factors that

influence the speed of internationalisation, by sampling Switzerland as a developed economy and Paraguay as an emerging economy.

Primarily, the analysis of the similarities revealed that the Uppsala model might be applied to both the Paraguayan and the Swiss cases (Johanson & Vahlne, 2009; Neubert, 2015). The SMEs put focus on the existence of FSA. Unique, innovative and high-quality niche market products and professional local partners are a precondition for every new foreign market entry because they compensate for the liability of outsidership and foreignness (Neubert, 2016a).

The second similarity is that all case study firms might be considered BGFs (Cavusgil & Knight, 2015; Knight & Liesch, 2016). These young firms are active through early export sales as their market entry form (Coviello, 2015) with strong attention on a market-seeking internationalisation strategy using, for example, a global exporter internationalisation model (Neubert, 2013a).

Although all SMEs understand the significance of early and fast internationalisation, almost all of the HSFs faced significant delays in their internationalisation projects due to disorganisation with unclear strategies and processes.

Networking and learning ability were identified as the key abilities of the entrepreneur (Coviello, 2015; Cavusgil & Knight, 2015; Neubert, 2016b; Ciravegna et al., 2014) and the main drivers of the speed of internationalisation. Networking in the sense of foreign markets is defined as the ability to create market opportunities to acquire new clients and distribution partners with local networks.

The existence of a structured international market-development process (Neubert, 2011) also drives the speed of internationalisation and another similarity. All the SMEs understand that disorganised internationalisation behaviour causes delays in the internationalisation process.

**Tab. 1: Similarities**

Similarities	Paraguay and Switzerland
Significance of early and fast internationalisation	Early and fast internationalisation is considered essential for the survival of HSFs from SMOPECs like Paraguay and Switzerland due to the small size of the home market.
Delays in the internationalisation process	Almost all HSFs face significant delays in the execution of their international market-development activities in comparison to the time planned in their business plans due to disorganised internationalisation behaviour.
Importance of internationalisation strategies and process	All SMEs understand the importance of structured market-development processes, including local market intelligence, for international success.
Abilities of the entrepreneur	The primary ability of the entrepreneurs (and their teams) is their networking ability in the sense of creating market opportunities to acquire new clients and distribution partners.

A comparison of the findings revealed the following differences. The main differences are based on the framework conditions of the home market. Paraguay is an emerging economy. Switzerland is a developed economy with a reputation for innovative HSFs with high-quality products, well-known university spin-offs, start-up coaching programmes, grants and a venture capital market that gives HSFs access to growth capital and exit channels.

Due to this difference in framework conditions, Paraguayan HSF could be considered less self-conscious and more risk averse. Investors such as founders, family and friends push less for internationalisation because they invest their money and focus on profitability instead of growth. In contrast, Swiss HSFs often acquire investors on the basis of ambitious business plans, which increases the pressure for early and fast internationalisation. Thus, it can be concluded that the reputation and the framework conditions of the home country and the quality of institutions also influence early and fast internationalisation (Hitt et al., 2016; Zucchella, et al., 2016).

Swiss HSFs are traditional BGFs seeking market opportunities wherever they are located (Cavusgil & Knight, 2015). In contrast, Paraguayan HSFs could be considered ‘born regionals’ (Cavusgil & Knight, 2015) that focus on neighbouring markets at the beginning of their internationalisation process.

The final difference can be identified by the entrepreneur’s role. While Paraguayan HSFs rely greatly on the entrepreneurs and their families, Swiss HSFs are managed by entrepreneurial teams with complementary abilities and receive support from investors, advisers and board members. Furthermore, the Paraguayan SMEs value the experience of the

entrepreneur more than the Swiss HSFs. This difference might be based on the notion that in newly created industries and markets, prior experience is not as important as the development of a new technology in an existing industry.

**Tab. 2: Differences**

Differences	Paraguay	Switzerland
Type of BGF	Born regional	Born global
Investors	Entrepreneur/founder, family and friends/business angels	Entrepreneur/founder, family and friends/business angels, government, foundations and institutional investors
Risk awareness	Higher risk-awareness and more focus on profitability than growth	Lower risk-awareness due to a higher pressure from investors to internationalise
Role and experience of the entrepreneur	High dependence on the entrepreneur	Entrepreneurial team with complementary skills and support of investors

## Conclusions

This study provides new evidence on the speed of internationalisation of HSFs from emerging and developed SMOPECs. It is based on the theoretical framework of the Uppsala and BGF model and examines how and why BGFs differ in their speed of internationalisation.

Despite the differences that distinguish both countries-of-origin, the majority of both Swiss and Paraguayan SMEs consider early and fast internationalisation important for the enduring survival of their countries' HSFs. The case study firms can be considered as BGFs and they follow the establishment chain of the Uppsala model. Both, Paraguayan and Swiss HSFs, face significant delays in the execution of their international market-development activities in comparison to the time estimated in their business plans. The main reason is disorganised internationalisation behaviour exhibited frequently. HSFs often enter new markets on the basis of their networks, use market opportunities or follow existing clients without analysing the attractiveness of foreign markets or following a pre-defined market-development process.

Most SMEs understand that this reduces the speed of internationalisation. They acknowledge the importance of a market-development process that begins with a detailed evaluation and selection of foreign markets before a company actually enters them. While Paraguayan HSFs start their internationalisation primarily in neighbouring countries, Swiss

HSFs have a global approach that depends on the attractiveness of each market. All SMEs understand that the role and the capabilities of the entrepreneur are crucial for the international success of their HSFs. The faster the entrepreneur (Paraguay) and the management team (Switzerland) learn business and techniques of acquiring clients in foreign markets, the higher the speed of internationalisation will be.

The findings of this qualitative multiple case study research project contribute to the field of research of international entrepreneurship because researchers will better understand how and why HSFs from SMOPECs differ in their speed of internationalisation. Furthermore, the findings also add to managerial practice because they will help managers to increase the efficiency of international market-development. Lastly, policy makers might also benefit from the findings in developing improved public support programmes for HSFs.

This comparative cross-national multiple case study research design has several limitations in size and scope that offer new ideas for future research. Most SMEs in the sample were males. Therefore, the effect of sex on how and why the speed of internationalisation of HSFs differs might be analysed. Future cross-national studies can focus on the differences between other emerging and developed SMOPECs. Future scholarly work might also include quantitative assessments of SME perceptions combined with qualitative data to provide greater clarification of the statistical significance of the variables of this study. Finally, it would be valuable to include correlational studies for analysing the relationships between two variables, for example the networking ability of the entrepreneur and the speed of internationalisation.

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## INTERNATIONAL PRICING STRATEGIES OF HIGH-TECH START-UP FIRMS

Michael Neubert

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### Abstract

**Purpose:** This paper aims to understand how high-tech start-up firms from small and open economies develop and optimise their international pricing strategies and models. The paper proposes modelling a pricing strategy process and outlining why and how leadership is important throughout the pricing process. The study aims to expand the study of international entrepreneurship and global firms by including a broader and deeper range of pricing aspects than is normally found in the international entrepreneurship and pricing literature.

**Design/methodology/approach:** The paper opted for a multiple case-study research design using different sources of evidence, including four in-depth interviews with CEOs of high-tech start-up firms. The case-study firms were selected using a purposive selection method. The interviews were conducted in December 2016 at the corporate headquarters of companies. The data was analysed using grounded theory to develop categories and to understand consistencies and differences. The theoretical framework of Ingenbleek, Frambach & Verhallen (2013) is used to analyse the pricing strategies of the case study firms.

**Findings:** The paper provides empirical insights about how high-tech start-up firms from small and open economies develop and optimise their international price-setting strategies and models. It suggests that successful leaders act as ‘integrating forces’ on two levels: by applying a structured and disciplined price-setting process with regular reviews and by mediating between corporate financial goals and the local market reality.

**Research/practical implications:** The results are relevant for researchers and policy makers who support activities that promote engagement into entrepreneurial activity. The results support that claim that policy makers should offer insights, training and financial support to give promising high-tech start-up firms the possibility to select the most efficient international pricing models and strategies. The results are relevant for entrepreneurs to understand the importance of efficient price-modelling processes, including regular price reviews, and the influence of the different price strategies and price models on financial results and sales revenues.

**Originality/value:** This paper fulfils an identified need to study how high-tech start-up firms from small and open economies develop and optimise their international pricing strategies and models.

**Keywords:** Price model, International pricing strategy, Born global, High-tech firm

**JEL Codes:** M00, M10, M31

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## **Introduction**

There is a need for companies to understand and optimise their pricing strategies. Price-setting helps determine a company's profit margin as well as market share, the ease with which sales are made, or the difficulty in gaining adoption of a product or service. It is perceived as a profit opportunity invitation to future competition and a territorial grab to existing competitors. Simon (2015) showed in his global pricing study with more than 2,186 companies from 40 countries that 87% of companies plan to improve their pricings strategies, practices and methods due to decreasing pricing power and increasing pricing pressure. The need to develop and implement the right pricing strategy is especially important for high-tech start-up firms from small, high-cost countries like Switzerland (Neubert, 2016a). Due to the characteristics of their home market, they have to internationalise early and fast (Neubert, 2016b), which increases the complexity of pricing decisions for new product innovations (Ingenbleek, Frambach, & Verhallen, 2013).

The purpose of this study is to identify various international price-setting strategies, practices and models used in real-world companies. From this selection, a comparison can be made of their relative strengths and proper implementations. The research problem is that international pricing decisions are more complex than domestic ones and frequently incur currency value swings, different inflationary pressures and difficulties in having production facilities in different markets, which leads to frequent price reviews (Hollensen, 2014).

This study has been performed in part by the call for research from Ingenbleek et al. (2013). In their paper, they call for further research on existing pricing processes with the intent of applying them towards an optimal application for new product development in foreign markets. Thereto, it is suggested that this need should be addressed through qualitative research methods, such as multiple case-study research.

## **1 Literature Review and Theoretical Framework**

This multiple case-study approach uses the framework of Ingenbleek et al. (2013). According to their research, managers base their pricing decisions in foreign markets on an extensive analysis of internal and external information (Neubert, 2013,) which includes their production cost, the competition and the value they are producing for the user. These decisions are regularly reviewed in order to prepare for and mitigate disturbances caused by changes in foreign competition, currency exchange fluctuation and inflationary pressures (Snieskiene and Cibinskiene, 2015). Due to missing access to relevant market information (Iyer, G. R., Xiao, S.

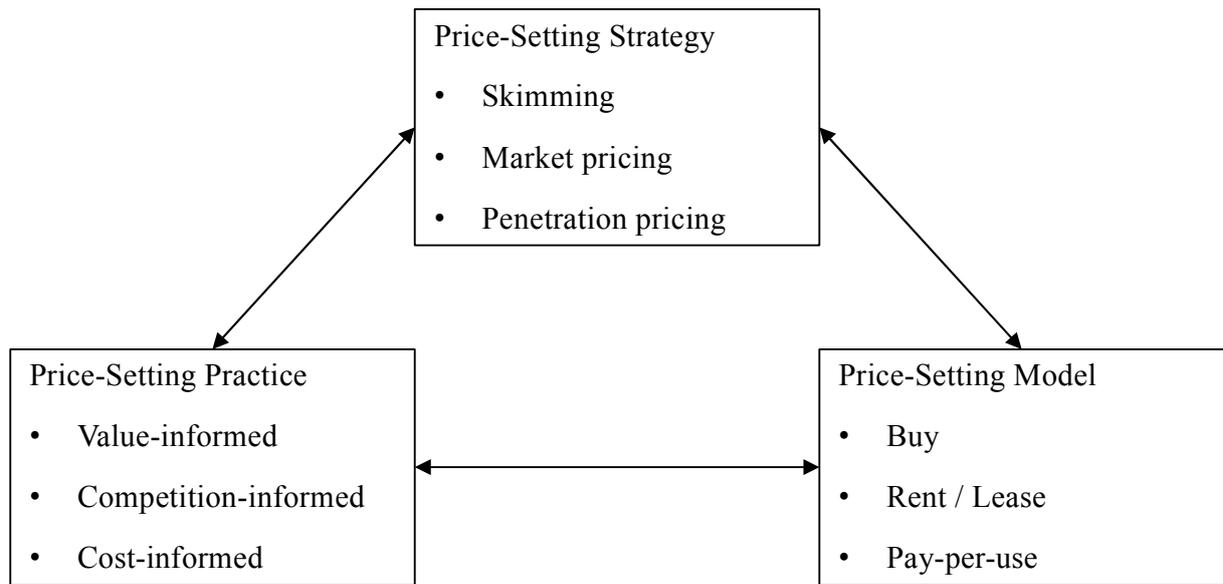
H., Sharma, A., & Nicholson, M., 2015), there is a tendency towards suboptimal pricing strategies (Iyer et al., 2015) and underpricing (Ingenbleek et al., 2013).

Prices in online markets have been found to change faster than in traditional stores, including a higher pass-through of exchange-rate fluctuations (Gorodnichenko & Talavera, 2016), but online distribution channels greatly increase price transparency, which leads to reduced price differentials between countries and a global standardisation of prices (Gorodnichenko & Talavera, 2016). Thereto, exporting companies have been found to experience greater rates of success depending on the relationships and partnerships formed with importers (Obadia & Stöttinger, 2015). Exporters can increase the performance of their importers (or local distributors) through their pricing strategies, especially by allowing higher margins or other incentive schemes. In response, importers then invest in the products where they can expect the best results, predominantly based on the marketability and the price margin.

The creation of a new product market or niche comes with the significant advantage in that high-tech start-up firms with patented and innovative products have high price-setting power to set the reference price for their new product categories (Copeland & Shapiro, 2015; Geng & Saggi, 2015). This price-setting power might be used to implement price innovations like for example 'pay-per-use' or 'freemium' in the sharing economy and gaming industry (Simon, 2015). New niche creation has historically come with roughly one to two years of market control before competitor companies can technologically catch up (Lowe and Alpert, 2010). This advantage is substantially decreased in foreign markets that don't enforce patent protection (Geng & Saggi, 2015).

High-tech start-up firms with patented products mainly opt for a born global strategy (Neubert, 2015) with a focus on one global market niche. In the first years of their existence, they apply a global exporter business model with strong local importers to penetrate their relevant global market quickly (Neubert, 2015). During the start-up phase they have to opt for the best pricing strategy, practices and models with often limited access to relevant information (Neubert, 2016b). Due to high production cost in Switzerland, low synergy and scale effects, they try to maximise their mark-up (Gullstrand, Olofsdotter, & Thede, 2014) and apply a skimming strategy (Hollensen, 2014). Therefore, they try to discriminate between markets and avoid spill-over effects between them.

**Fig. 1: Theoretical Framework Based on Ingenbleek et al. (2013)**



Source: Ingenbleek et al. (2013)

## 2 Research Methodology

A multiple case-study research method was used in order to best compare and contrast existing pricing strategies, practices and models (Yin, 2015). In contrast to an experimental design or a survey, a multiple case study has more flexibility, allows an in-depth analysis of a complex research problem within a highly contextualised environment (Yin, 2015), and allows for a comparison between different cases (Yin, 2015).

Data collection is based on different sources of evidence, including four in-depth interviews with subject matter experts (e.g. CEOs, founders of high-tech start-up firms). The interviews with the SMEs were conducted in December 2016 at the corporate headquarters of the case-study firms. The selection of the case study firms was based on a purposive case selection strategy where the typical cases are selected from a representative sample of high-tech start-up firms.

**Tab. 1: Socio-Demographic Profile of Case-Study Firms**

Company	1	2	3	4
Industry	Nanotechnology	Biotechnology	Semiconductor	Logistics
Incorporation	2012	2009	2008	2008
Location	Switzerland			
Employees	12	58	15	14
IP protection	Patent protection for the core technology			
Strategy	Born Global / Pioneer			
Business Model	Global Exporter			
Products	Physical product (device) plus services and consumables			

The data analysis was based on grounded theory in order to develop patterns and categories and to identify consistencies and differences in the data. Based on the research goals, the data analysis follows a logical sequence, starting with an individual case analysis to develop themes, followed by a cross-case comparison to identify similarities and differences.

The purpose of the study has led to the following two research questions:

1. What are the preceptions of SMEs about the selection of price-setting strategies, practices and models?
2. What are the preceptions of SMEs about why and how the case study firms differ in their selection of price-setting strategies, practices and models?

### 3 Findings

The results of this multiple case study are presented in this chapter to answer both research questions individually.

#### 3.1 Selection of Price-setting Strategies, Practices and Models

The analysis of the data collected from the in-depth, semi-structured, qualitative, face-to-face SME interviews revealed the following findings: These findings answer the first research question:

*What are the preceptions of SMEs about the selection of price-setting strategies, practices and models?*

The case study firms 1, 2 and 3 use a skimming price-setting strategy in their global niche market. They focus on early adopters, which value the competitive advantage these innovative and patent-protected products provide and are willing to pay the respective price.

Case study firm 4 uses a market price-setting strategy with globally standardised prices due to high market transparency and increasing competition from similar solutions. All case-study firms indicate their prices in their home market currency. Despite the price standardisation, end-user prices might vary because of different payment conditions, foreign currency fluctuations, export costs (e.g. logistics, export/import, product registration) and product/market specifications.

**Tab. 2: Price-Setting Strategies, Practices and Models of Case-Study Firms**

Company	1	2	3	4
Price-setting strategies	Skimming Standardisation	Skimming Standardisation	Skimming Standardisation	Market pricing Standardisation
Price-setting practices	Value-informed	Value- and competition- informed	Value-informed	Competition- informed
Price-setting models	Buy	Buy	Buy	Pay-per-use

The choice of the price-setting strategy determines the choice of the price-setting practice and the price-setting model. The price-setting practice is a process of data collection and decision preparation, which leads to a pricing decision (Ingenbleek et al., 2013). Accordingly, the case-study firms 1–3 used predominately value-informed price-setting practices. The SMEs of the case-study firms 1–3 expressed their intention to understand the added value of their products and the willingness to pay of their potential clients but admit that there is a significant risk of over- and underpricing due to missing market data (Iyer et al., 2015; Ingenbleek et al., 2013). Case-study firm 4 mainly focuses on a competition-informed price-setting practice although the added value and the cost are also considered for pricing decisions. All SMEs indicated that they base their pricing decisions on the information received from distribution partners, and to some extent from existing clients, even though they are biased and don't constitute a representative sample.

The selection of the price-setting model is driven by the price-setting practice and the price-setting strategy. The case study firms 1–3 use a traditional 'buy' pricing model for all products and services. This creates unique and high cashflows whenever a new client is acquired and subsequently recurring revenues from service contracts and consumables. Case study firms 1–3 work with local distributors, which add a mark-up on the prices or receive a commission. Case study firm 4 uses a 'pay-per-use' price-setting model to generate a growing,

stable and recurring cashflow. The price includes all service and maintenance costs for the client. Case study firm 4 distributes its products directly to the B2B clients without any intermediaries by using online and personal selling distribution channels.

The main finding of research question 1 is that all case study firms have implemented price-setting strategies, which are based on suitable price-setting practices to collect data and to prepare pricing decisions. The selection of the price-setting models is based on the price-setting strategy and practice. The answers to research question 2 identify the reasons why and how price-setting strategies, practices and models differ.

### **3.2 Differences in the Selection of Price-Setting Strategies, Practices and Models**

The analysis of the data collected from the in-depth, semi-structured, qualitative, face-to-face SME interviews revealed the following findings: These findings answer the second research question:

*What are the perceptions of SMEs about why and how the case study firms differ in their selection of price-setting strategies, practices and models?*

The first theme is that the price-setting power influences pricing decisions. The differences in the selection of the pricing strategy are based on market competition, including the price-setting power of the case-study firms. According to the SMEs, the price-setting power is determined by the patent protection and the perceived value of the product for the client (Copeland & Shapiro, 2015; Geng & Saggi, 2015). Thus, case study firms 1–3 apply a skimming price-setting strategy whereas case study firm 4 selects a market price-setting strategy.

The second aspect is that financial aspects influence pricing decisions. Consequently, SME prefer ‘buy’ pricing models (preferably with pre-payments) to generate immediate cashflows to reduce capital requirements. Recurring revenues, of for example service contracts and consumables, should stabilise the cashflow and reduce the dependence on new business generation. High-tech start-up firms have often no other source of revenues and depend on expensive sources of capital like private equity or venture capital to finance their working capital. Obviously, founders and entrepreneurs try to limit the capital requirements because they want to keep as many shares as possible.

The third theme is that the bargaining power of the local distributor influences pricing decisions. The case study firms 1–3 use a global exporter business model with local distribution partners. These distributors need to be incentivised to sell the products of the exporter. According to the SMEs, the main motivator to increase sales revenues are financial incentives

(Obadia & Stöttinger, 2015), like a commission or a mark-up, which is paid out as soon as the client was acquired. Therefore, our case study firms adapt their price-setting strategies, practices and models to facilitate a successful collaboration and to avoid a prefinancing of acquisition cost.

The fourth theme is that the requirements of clients influence pricing decisions. The choice for a price-setting model is mainly based on client needs. The following example shows how needs of different B2B clients lead to different price-setting models. Academic clients and other government institutions prefer a 'buy' price-setting model, because they only want to apply once for a budget, which should cover the acquisition cost. In contrast to that, industrial clients (B2B) often prefer (e.g. due to financial reasons) a 'pay-per-use' price-setting model to book operating expenses instead of capital expenses.

The fifth theme is that the potential of higher corporate valuation influences pricing decisions. Case study firm 4 has selected a 'pay-per-use' price-setting model because it offers (in a positive scenario) a higher growth potential, stable future sales revenues and lower acquisition costs.

The main finding of research question 2 is that price-setting strategies, practices and models differ significantly between the case-study firms for financial and market reasons. Because of the significance and complexity of pricing decisions, the case study firms regularly review their price-setting strategies, practices and models using predefined processes.

## **Conclusions**

This study provides new evidence about the pricing decisions of high-tech start-up firms from small and open economies. It analyses what price-setting strategies, practices and models are used, and why and how the pricing decisions differ. The research method is a multiple case-study research design. Data is collected through SME interviews as a primary source of evidence. Grounded theory is used to analyse the collected data.

The first conclusion is that all case study firms have implemented price-setting strategies, which are connected with suitable price-setting practices. The selection of the price-setting models is based on the price-setting strategy and practice.

The second conclusion is that pricing decisions are based on market requirements and financial needs. Thus, three out of four case study firms selected a traditional 'buy' price-setting model due to the requirements of distributors and clients and the goal to generate cashflow as early and fast as possible.

The last important conclusion is that all SMEs underline the high significance of pricing decisions. This includes the need to implement efficient price-setting processes, strategies, practices and models in the organisation with the intention to review pricing decisions regularly and to react early and fast on new market information.

The results of this study are relevant for researchers and policy makers who support activities promoting engagement in entrepreneurial activity. Such policy makers should offer insights, training and financial support to give promising high-tech start-up firms the possibility to select the most efficient international price-setting models, practices and strategies for foreign export markets. Results are relevant for entrepreneurs to understand the importance of efficient price-setting processes, including regular reviews and the influence of the different price-setting strategies, practices and models on financial results.

This multiple case study research design has several limitations in size and scope that offer new ideas for future research. Future scholarly work might also include quantitative assessments of SME perceptions and that with qualitative data to provide greater clarification of the statistical significance of the variables of this study or to replicate it with other case-study firms from different industries and markets.

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## SUSTAINABILITY IN THE ECONOMIC SENSE

David Novak

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### Abstract

**Purpose:** What is the perception of sustainability in the economic sense? Human behaviour cannot continue in the actually given way as the usage of natural resources exceeds regenerating ability of the earth. The result of human behaviour is called ecological footprint of human mankind; it will have crucial impacts on national economies and the business of its companies via external diseconomies. Indicators, values and consequences get investigated.

**Design/methodology/approach:** Any here discussed objectives are only a small extract of all existing or potential objectives. The research method used by the author was an analysis of existing and published literature within Web of Science and elsewhere like the UNO and her organisations (in total more than 15 references), mainly from the last decade. The approach of the topic is to define and evaluate the actual status quo of sustainability regarding economics from the US American and German point of view.

**Findings:** Research findings are shown within a brief summary to offer an opportunity for further analysis, discussions, or results. The ecological footprint is an accepted possibility to measure effects of men on nature, based on numerical indicators and values. The incurrence of external diseconomies must be charged or taxed in full. Economy, Society and Environment have to go hand in hand and people have to be taught their current behavior cannot continue in the previous way anymore.

**Research/practical implications:** Results and implications for practice, applications and consequences are identified as added value. Changes of sustainability and its effects can only be evaluated in the mid and long term run. Any real short term effects should not be expected. Avenues of future research should have always a focus on sustainability, if current behaviour of human mankind offers an acceptable opportunity of surviving for future generations. Originality/value: This paper sees sustainability from the economics point of view (a research gap so far) and is in contrast to most existing literature which has the approach from the environment (natural sciences/technique) or society/politics.

**Keywords:** Sustainability, effects on economics and business

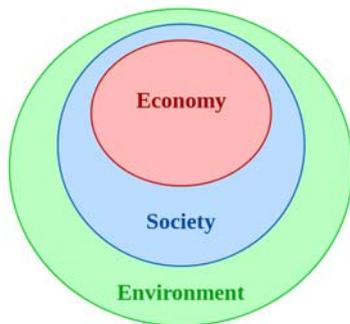
**JEL Codes:** Q01, Q51, Q57

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## Introduction

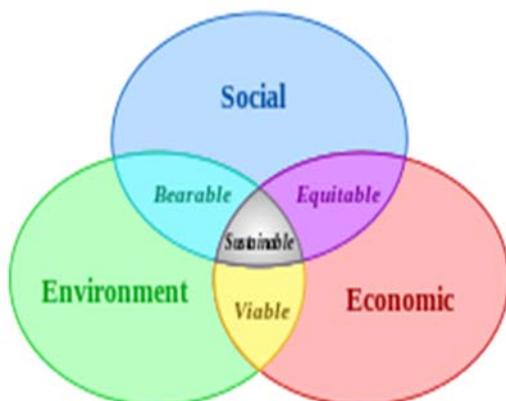
The whole topic is by far more difficult to define or to isolate as it is very wide and more or less everybody feels affected by it. Sustainability is usually split into three parts or goals: Economy, Society and Environment or to be more precise into economic development, social development and environmental protection. It is not finally decided how these three goals are connected with each other. Following are two diagrams showing the interconnectedness. A single „correct“ view does obviously not exist (a research gap so far).

**Fig. 1: Three pillars of sustainability**



Source: Scott Cao, M. (2009). Green Economics, London

**Fig. 2: Sustainable development at the confluence of three constituent parts**



Source: Adams, W.M. (2006). The future of sustainability

## **1 Economy and sustainability**

Under sustainably economy (short version) is understood by the United Nations goal #8: ...to support a long term, inclusive and sustainable growth, full employment and a so called „decent work“ for all (UNDP, 2017). The goals are defined as Sustainable Development Goals (SDG). Literally is defined: „The SDGs promote sustained economic growth, higher levels of productivity and technological innovation. Encouraging entrepreneurship and job creation are key to this, as are effective measures to eradicate forced labour, slavery and human trafficking. With these targets in mind, the goal is to achieve full and productive employment, and decent work, for all women and men by 2030 (UNDP, 2017). “

### **1.1 Political economy**

As the main topic sustainability is even very wide, effects have to be differentiated between single companies (business administration) and those on the whole economy (political economics) where single companies can, but need not be affected on. Important regarding this matter are also external effects which have to be carried/paid by a third party (usually the inhabitants today and in future) which has no direct or indirect advantages by the behavior of others. One of the challenges is that present persons should not diminish the prospects of future persons to achieve a defined level of welfare, utility or consumption (Bromley, 2008).

### **1.2 Definitions and goals**

Definitions and goals which were set, have to be understood as results of the understanding that former behaviour (using earth without taking care of environment) und maximizing growth of industry cannot be the only targets. It started 1972 by the book „The Limits to Growth“ by the Club of Rome, over the Brundtland Report „Our Common Future“ 1987 by the World Commission on Environment and Development (WCED, 1987) followed by the Earth Summit of the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro 1992 and following environmental conferences like Kyoto 1997, Johannesburg 2002, developing Agenda 21 (Parson et al, 1992), until finally Paris 2015. The Brundtland Commission defines sustainable development as „ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs“ (WCED, 1987).

In the scientific literature can be found the phrase of the three pillars of sustainable development as shown in the figures 1 and 2, but there is within the description a huge variety

with differences, mostly focused on the social pillar. A different way to define sustainability is to set goals and values and measure the grade of achievement via indicators. A possibility to differentiate them is the time horizon: short-term, middle-term or two-generations and long-term goals. Regarding goals other aspects have to be taken into consideration like „is the goal really achievable“ or „do countries make progress into the right direction“ (UN Secretariat et al., 2017)? As progress is coming obviously slowly, for many goals is used a time horizon of two generations or even the long-term goal (an UN Millennium Project). Based on these facts the UN has developed a Global Scenario Group which has the task to care about the transition of sustainability. Important seems to this group that changes can be achieved without a social revolution or a technical miracle. Nevertheless a precondition is a governmental commitment and the political will. Several key words seem to be those which will affect design of products in future like: Recycling, Repair, Reuse, Recondition, Refurbish and Remanufacture.

### **1.3 Indicators and values**

First has to be defined how to measure or evaluate the degree of achievement of goals. For measuring first indicators have to be set. Combining various initiatives there comes a large number of efforts to define indicators which could or should be used. As the countries differ extremely around the world, they use very different criteria to measure any kind of progress. In total has to be stated that the list of items which can be sustained or developed is extremely long and is obviously influenced by many different stakeholders, who have different opinions and what is maybe even more important, different personal goals. It is a huge difference if the group of stakeholders is mainly based on social politicians, or on global acting corporations, investors and regulatory agencies. Desirable goals depend therefore essentially on the constitution of the group. Thus, the range of indicators becomes very long. At the end, the big number of indicators gets aggregated to a special vision how sustainability should look in this case. The second challenge is the used time horizon. Many indicators are set as mid- or long-term goals (Parris, 2003). The point of view is therefore limiting in general the value of the statement.

In general, it has to be stated that due to obviously too many influencers many statements became too long and therefore complicated to clearly understand or incorvertible into measurable and achievable goals. Maybe these unprecise statements are coincidence, maybe not. Here is definitely a research gap.

#### **1.4 Causes of depletion and economic costs**

A long time it looked like if the majority of natural resources would be inexhaustible and without limits of capacity. Therefore they were called Public Goods which was wrong, what became obvious by time. Then it was changed to merit goods. The challenge is that there hasn't to be paid any, or any realistic, prices for them so that a depletion is the result. Based on this development it comes to a misallocation of goods or production factors, for what the market economy has no or no acceptable solution yet. This erroneous trend is called market failure (Cansier, 1996). This means in concrete that the politics has to change the general framework, that consumers and producers stop waste of energy and material. Sustainable products have to be developed and sold. If this fails politics has failed.

Target of the neoclassic environment economics is due to environment protection operations to stop depletion of natural resources until there is achieved an optimum between the costs damaging environment and costs for environmental protection. To provide such an „optimal“ environmental protection politics needs to internalize the costs which were paid before by the public (a kind of back-shifting) so that the price would reflect the real value or costs of economics. A precondition for that would be a calculation of environmental damage or loss (Cansier, 1996).

#### **1.5 External costs and sustainability**

The science sees the creation of external costs which are not borne by the polluters, but by the population, one of the core problems of sustainability. Dirty or unsustainable products and production processes are too cheap and are due to the low price in the market. Ecological products, which bear their own costs, are more expensive compared to the dirty ones and therefore do not penetrate the market. The result out of that is: External costs are the main market failure. Pollution taxes and other flexible market instruments are applied to internalise external costs of atmospheric emissions. This challenge is well investigated by Streimikiene et al (2016) about external costs and pollution taxes. This has a major impact on the spread of renewable energies. The internalization of external costs is intended to eliminate the economic relevant misallocation (market failure). The internalization of external costs leads to a balance between private and macroeconomic profitability and therefore the Pareto optimum. When such externalities exist, markets are not efficient unless their external costs are internalized and economic agents take into account these costs when making decisions. This internalization would reduce costs of renewable energies nominal as well as relative to existing polluting

technologies. This price reduction would increase the competitiveness of renewable energies and reduce that of polluting energies (Streimikiene et al, 2016).

## **2 Sustainability in its development**

Based on the last decades a so called „green economy“ has developed. It is either called environmental economics or ecological economics; they contain concepts and approaches of cleaner production, waste hierarchy, bio-economy, industrial ecology, circular economy and nature-based solutions. Dematerialization achieved through product-servicing, life cycle assessment and honest cost-benefit analysis can improve and support further steps in sustainability (Loiseau et al, 2016). This means in concrete: the current challenges are understood and solutions are developed.

## **3 Ecological footprint**

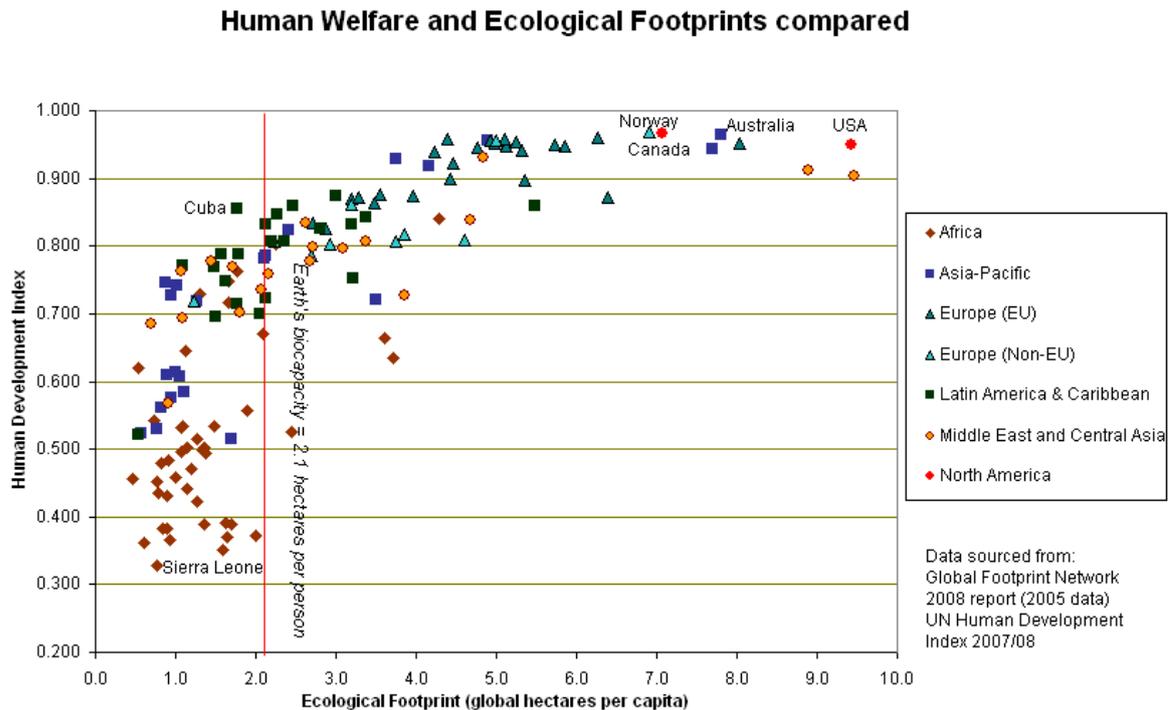
The ecological footprint measures how much nature (e.g. in ha, acres) it takes to support people, or what is needed to keep existing living standard or life style of a person on sustainable basis. This includes space required for the production of clothing and food or for the provision of energy, but also for the disposal of waste or for binding carbon dioxide released by human activities. The values are given in global hectares per person and year. The ecological footprint is often used to point out social and individual sustainability deficits in connection with the concept of education for sustainable development - depending on whether a person converts his ecological reserve into an eco-deficit. Based on existing data (see figure 3) the largest ecological footprint in 2010 was the average population of the United Arab Emirates with 10.68 ha / person, the inhabitants of Qatar with 10.51 ha / person and the population of Bahrain with 10.4 ha / person. The lowest was found in Bangladesh with 0.62 ha / person, East Timor with 0.44 ha / person and Puerto Rico with 0.04 ha / pers.

It has to be stated that any final evaluation of this method cannot be done. An important statement regarding this matter is given by Fiala (2008), described below. The assumptions behind footprint calculations have been criticized. E.g. he „argues that the footprint arbitrarily assumes both zero greenhouse gas emissions and national boundaries, which makes extrapolating from the average ecological footprint problematic. The footprint also cannot take into account intensive production, and so comparisons to biocapacity are erroneous. “ Example: it is obvious that an inhabitant in New York City will have a completely different footprint, than a farmer in a rural area with profitable climate conditions. „Using only the assumptions of

the footprint then, one could argue that the Earth can sustain greatly increased production, though there are important limitations that the footprint cannot address, such as land degradation.“ This means: if a worker in an industrial land manufactures a lot of products his footprint is of course by far higher than of a person, unemployed, in a third world country. „Finally, the lack of correlation between land degradation and the ecological footprint obscures the effects of a larger sustainability problem“.

Final deduction on this topic is done by Kissinger et al (2011): the average world citizen has an eco-footprint of about 2.7 global average hectares; the challenge is: there are only 2.1 global hectare of bioproductive land and water per capita on earth, based on this theory. Result: humanity has already overshoot global biocapacity by 30% and it lives now unsustainable by depleting stocks of "natural capital". The "Ecological Debt Day" or "Earth Overshoot Day", which is also known as the "Ecological Day" or "World Day of Creation", is an annual campaign by the Global Footprint Network organization. This indicates the calendar day of each year, from which the resources consumed by humanity exceed the capacity of the Earth to generate it. The Ecological Debt Day is calculated by dividing the world's bio capacity, i.e. the natural resources produced by the earth over a year, by the ecological footprint of mankind multiplied by the number 365. The first year it was calculated for was 1987 and the day was the 19<sup>th</sup> of December. In 2012 it was on August 22<sup>nd</sup>, in 2016 the 8<sup>th</sup> of August (Fiala, 2008). This means: the trend of the last 30 years shows a clear advance to an earlier date. The people live on the costs of their descendants.

The following figure shows the relation of ecological footprint and human welfare. The statement „there is a complete imbalance“ is not exaggerated, especially if 2.1 in the index is seen or defined as limit from the scientific point of view.

**Fig. 3: Human Welfare and Ecological Footprints compared**


Source: Human Welfare and Ecological Footprints compared (Global Footprint Network 2008 report (2005 data), UN Human Development Index 2007/08)

#### 4 Sustainability in actual reality

Any plans or any targets are only as good as they can be brought into force. It has to be found a big compromise between those people who are in general concerned regarding environmental protection and on the other hand those people who value economic development. The third side is the improvement of human conditions. A plan how to bring the necessary activities into force is the Local Agenda 21 which describes a local-government-led, community-wide, and participatory effort to establish a comprehensive action strategy.

Important in this connection is the understanding that the transformation into activities can be done only on local level. And this means it has to be „lived“ by all decision makers and cannot be shifted by local politicians to the federal government.

Sustainable development is often based on various social movements. Those people have a similar ideology about that how a world should look like (from their point of view) and they collaborate with many Nongovernmental Organizations (NGOs) as well as journalists. Based on that result, local movements have the target to bring activities into forces and achieve fixed targets. Therefore these targets have a strong social approach e.g. supporting poor people,

paying subsidies for agriculture or paying fair wages (Brecher et al, 2000). The Millennium Villages Project aims to achieve the Millennium Development Goals in villages across sub-Saharan Africa, through an integrated set of interventions designed to catalyse the transformation of sub-subsistence farmers' into small-scale entrepreneurs' (Wilson, 2017).

Various magazines elect every year the most sustainable companies in the world as marked by Corporate Knights and published e.g. in Forbes magazine. For 2016 they have evaluated BMW (German car manufacturer) as leader. The ranking exclusively considers characteristics that can be measured quantitatively and does not factor in a company's exposure to risks that cannot be quantified and are thus subjective (focus on numerical indicators and values). Certain indicators are prioritized over others across industries. Goals of sustainability are seen meanwhile as necessary. An evidence can be seen the implementation of a Division of Sustainable Development within the UN (United Nations) Dept. of Economic and Social Affairs as well as on the World Bank. Various governmental entities have been established to create and monitor very specific sustainable development strategies (Dalal-Clayton, 2017).

## **Conclusion**

Let's start with a question: Can any final conclusion or findings be given? Any kind of evaluation seems here to be very challenging as the points of view between people and between nations might be very different. Nevertheless, indicators and values are defined to make a rating more precise and therefore conclusions and findings are:

- An empirical cognition can be the ability to be(come) open minded for compromises between the three groups concerned about environment, value economic development and improving human/social situation. So there happen many negotiations between these three groups finding practical solutions which can be brought into force.
- Any final assessment of sustainable economy was not found in any literature (a research gap so far and limiting the statements in this paper); it was always only combined with the general approach, based on the Brundtland Report, that it is part of the „big thing“ sustainability. Here are various avenues of future research to bring sustainability into daily life of people around the globe. The only five indicators about sustainability used by the German council of experts give an idea how to measure welfare and sustainability in future. Up to now they are not yet part of a bigger mathematical or reference model.

- The incurrence of external diseconomies must be charged or taxed in full. This system must apply worldwide. Pollution must be borne in full by the polluters. That will decrease the relation of the price for renewable energies to polluting ones.
- Natural resources are essential for our economics and for the life on our planet. The consumption or wasting of natural resources is still growing. This should be the approach of politics to interfere and to stop this kind of development.
- To develop economy into the needed direction, economy has therefore to implement environmental protection and human/social behaviour into their daily politics and long-term strategies to fulfil expectations of people or nations in general.
- Economy cannot be seen separately, or it cannot be split from the two other groups, as it earns the money to finance changes and is the basis of surviving to buy daily needs.
- The summary of these facts shows the avenue of future research: Economy, Society and Environment have to go hand in hand and the people have to be taught that their current or used behaviour cannot continue in the previous way anymore.
- The reality proves achieving agreement on any kind of sustainable values is a very challenging task, as very different stakeholders with very different targets do exist.
- A successful approach can be seen in a positive vision of a world in which basic human needs, and to this belongs also consumption, based on expending money which was earned before (economy), can be reached without destroying or degrading any kind of systems (environment) we all depend on.

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## THE INNOVATION CENTERS DEVELOPMENT IN THE REGIONAL CONTEXT OF RUSSIA

**Ekaterina Panarina**

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### **Abstract**

**Purpose:** According to the ranking by global competitiveness benchmarking study (WEF Competitiveness Report, 2017), Russia has the 43<sup>rd</sup> index of the competitiveness out of 142 countries compared by 67<sup>th</sup> place at 2012. We can explain it with different reasons but primarily it is a result of strengthened fundamentals, including the quality and quantity of education, training programs, and innovation capacity. In this article we consider the innovation to be the major factor that keeps countries to sustain their competitiveness that is a strategic goal for any economy including the Russian economy as well.

**Design/methodology/approach:** Design approach for the research is based on benchmarking data and case studies analysis, as well as on author's research activities and practical experience. The sample was chosen from research institutions (national research universities) and innovation centers as well as enterprises in different industries.

**Findings:** There are a few forms of innovation ecosystem were considered that could become a moderator for evolving innovations and sustainable economic growth. Those are integrated distributed centres of competences at enterprise level, innovative business regional clusters (hubs), high skills centres of competences at universities, business-universities joint alliance. The concept of innovation development and the findings of this article defiantly make practical impact and resonance that get to be discussed and resulted in actions of regional and national administrations.

**Research/practical implications:** The outcomes and implications proposed in the article related to functioning of Centres of Competence and Innovation Centres are very important for practice, and for keeping and increasing the positive dynamics of economic development cycle. The establishment of the Innovation Centres of different forms has to become a national idea of the sustainable economic growth. It has to be included to the strategic plans of the government for the better future.

**Key words:** innovation, competitiveness, innovative management model, leadership, competence, knowledge-based economy

**JEL Code:** O31, O34, O43

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## **Introduction**

For many years, Russian economy was depending on a flow of capital related to mineral revenues, however the oil and gas prices reduction with a significant drop at year of 2014, made government concerned about new factors for economic growth. In this time innovation based models are playing the most remarkable role.

### **1 Problem Formulation**

World economy mainstream tendency is characterized by growing pace of technological development and innovative capabilities, which Russia needs to catch up with. Looking at Russian innovative indexes, one has to admit that the economy is behind the world's leading economies, relying upon imports of modern technology.

By the monitor report of “The Russian Innovation strategy-2020”<sup>29</sup>, we can conclude that less than 10% of total companies in Russia invest directly in research, development (R&D) and innovations. If we compare it with the developed countries of Europe as for example Germany, where the investments in innovations are up to 70%, we see the extremely low percentage of the investments. Total business expenditures for R&D and innovations are about 1% of GDP. It's very low percentage not only comparing to 3-5% in world's leading economies, but also to 1,5-2,5% in many of developing countries. Russia stands far behind of the most of economies in innovative capability. There are only three Russian companies that presented in the global list of 1000 companies who make the biggest expenditures for R&D and innovation. Among them is JSC Gazprom (108<sup>th</sup> place), which carries on the business of extraction, production, transport, and sale of natural gas, with 0,6% of revenue spent on R&D.

The situation of low level expenditure to innovation development is originated by structural and organizational limitations preventing business from active utilization and management of innovations. The index of companies to be able to adapt new technologies, Russia ranks 41 out of 133 countries, along with the as small country as Cyprus. Passive innovation including adopting of existing technologies is still the most widespread type of behavior among Russian companies (34%). There are only 16% of radical innovators developing their own advanced technologies. Necessary to mention that total share of Russian innovative products on global markets is consistently less than 0,5% compared to 16% and 14% of China and US respectfully. The Russian strongest positions in innovation there are non-

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<sup>29</sup> [https://www.tekes.fi/globalassets/global/tekes/venaja-raportit/russian\\_innovation\\_strategy\\_2020\\_in\\_brief.pdf](https://www.tekes.fi/globalassets/global/tekes/venaja-raportit/russian_innovation_strategy_2020_in_brief.pdf)

electric machinery (2%); chemicals (0,8%) and aerospace technology (0,4%) (Cited directly from Russian Innovations strategy-2020 in brief, 2015)<sup>30</sup>.

Despite the existing human potential and fundamental research activities, the level of innovative development in Russia still is very low.

The intensified global competition is defined by the factors of innovative systems as for example, highly prepared and qualified human resources, building and applying new knowledge and technologies. The high competences of management and high level of innovation activities are the factors that are playing the major role for political and economic sustainability and stability in every economy. The relevance and significance of the innovation development issue for Russian companies have pushed us to search for a solution.

## **2 Main approaches to boost the innovative capacities at the regional context**

Innovation begins with the human beings who have ideas and develop knowledge, skills and experience in new solutions. The world today is undergoing fundamental changes. Many countries increased focus on developing the innovation climate that combine ecological, social and economic sustainability. In Russia, we need to be more innovative to meet the global societal challenges.

But what could be the approaches that we may build the model for innovative development on? Following approaches are defiantly could be considered as the fundamental for the innovative development.

For the first approach, we will stress out that one of the main factors determining the innovative development of economic systems is their ingenuity and self-adaptation. Successful enterprises that focused on self-development have adapted to taking individual strategic responsibility by employees; co-shared authority model; adapting flexible structures; integrating creativity and innovation.

In this work among others approaches to increase innovative capacity of the economy, we consider the idea of *Integrated Distributed Centers of Competence* (hereafter - CC) establishment (that was developed in some author's articles as for example "Innovation-based Model of Economic Development as a strategy for Sustainable Growth in Russia" (Panarina, 2016).

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<sup>30</sup> [https://www.tekes.fi/globalassets/global/tekes/venaja-raportit/russian\\_innovation\\_strategy\\_2020\\_in\\_brief.pdf](https://www.tekes.fi/globalassets/global/tekes/venaja-raportit/russian_innovation_strategy_2020_in_brief.pdf)

The concept of CC is based on technologies for developing individual innovation, competence, and self-development mechanisms and defined as: “a Competence Center stands for frequent activities aimed at creating an innovative self-developing environment by identifying segments of key personnel, engaging personnel in innovative projects, allocating the means to support these projects, creating better access to information resources, and activating the available organizational and motivational factors” (Panarina, 2015, p.234). The major goal for establishing an integrated CCs streams in achieving high micro-competitiveness level; adopting an innovative management models, implementing distributed leadership, training programs for preparing the key personnel and collecting and adapting the best practices in a specific field of business and stimulating the potential for further growth.

It's a new concept for Russia but the world-wide tendency is in concentrating and sharing knowledge as a lever of ensuring changes and new opportunities. CCs in this context, could become the Centers of Knowledge Value Collectives that generate, use, integrate the knowledge. This knowledge will get to become the engine to develop different product and technology innovations. In perspective, the initiative of competence centers has to be focused to generate multi-disciplinary, problem-solving knowledge that will be practically applicable to new technologies and processes integrating the human resources from different operations, management levels, functions, scientific researchers, partners, customers, investors, government funds, etc. to leverage the level of competitiveness of the Russian economy.

The development of the integrated Competence Centers has to bring an optimization of the company resources to support knowledge, management initiatives, training, sharing expertise, and technology benchmarking.

There is a start point when companies in Russia are gradually turned to appreciate the value of their intellectual assets and created knowledge. In this case the new appraisal systems are being implemented to define, evaluate and develop top organizational talent and potential leaders. The management started to pay attention to people development, training, intellectual update and mobility. The mechanisms to identify the employees' professional competences and to create a special learning environment that supports knowledge exchange and constant learning are slowly adopted by industrial companies that want to improve employees' loyalty and manage their human capital. In this way, the establishment of integrated distributed Centers of Competences could become a platform to identify, unite, integrate, implement the intellectual assets into the practical innovations and development.

Another approach to improve innovative capacities of Russian economy is by creating the *innovative techno-business regional clusters*. There is an undertaken attempt to build a

prototype of the Silicon Valley in Russia named the Skolkovo Innovation Center. It is a high technology business area that is being built near Moscow as a hub of science and technology with entrepreneurial spirit, where qualified corporations and individuals become "residents" of the center with proposed projects and ideas receiving financial assistance.

Five clusters make the eco-system of Skolkovo that specializing in different areas: IT, Energy, Nuclear Technologies, Biomedicine and Space Technologies and these clusters are tasked with creating an effective model for successful commercialization. The clusters include startup companies and corporations' innovative specialists with the strategic goal to maintain the competitive edge of Russia's economy and to encourage the competitiveness of some industries and markets by breakthrough technologies and products.

However, there is only one example of the regional cluster that has to go beyond central part of Russia and be established also in other regions of the country as Tomsk, Ekaterinburg, Novorossiysk, and Volgograd.

Another approach to increase innovation capacities lays at an idea to start *world high skills centers of competence* in Russian universities, primarily technical ones, as because the generation of innovations at polytechnic universities and engineering scientific centers are historically have been kept high. However, the success of those centers depends a lot on effective beneficial partnerships with companies. The educational establishments and businesses should go along and help each other to transform cutting-edge scientific knowledge into new practices.

Based on the experience of Russian best practice companies (Gazprom, Lukoil, Joint Aircraft Company (Ulyanovsk), Sibur Holding, Rosatom, Sberbank, etc.), partnerships are ensuring the integrity and cross-functionality of the innovation synergies boosting the modernization of the technologies, improving the operational efficiency and focusing on the latest tendencies in research applications. This type of *business-university joint relationships* also supports training of professional cadre and provides expert guidelines to innovative development projects.

Ideally industry-university alliances have to be supported by governments and regional fundraising and public-sponsored programs. Focus on the cooperation between science and business needs to be developed as a national strategic idea that adds economic value on the life of the whole society.

Unfortunately, the distance between science and business in Russia remains wide. There is a low integration between the academic potential and the capabilities (needs) of the industry to help implement innovative solutions.

However, the local solutions to develop a joint partnership are slowly implementing. For example, St.-Petersburg Mining University opened Schneider Electric Center of Competence in research and education together with Schneider Electric in Russia (*Schneider Electric is a global expert in energy management and automation. It employs 170 000 people and the revenue of the company for the year of 2014 reached 25 billion Euros. It's a world leader company who has its offices in more than 100 countries, helping customers to manage energy and processes using the most secure, reliable, efficient and environmentally friendly way. It helps with technology, software and services to its customers to improve the management and increase the degree of automation of their operations: whether it's the simplest switches or complex industrial systems.*

When the agreement to open the Center of Competence between the institution and the global company was made, the primarily focus was made on improving the quality of vocational training of students, professional training of teachers in the field of new sources of energy saving the environment. In addition, the Center organized a joint research in the field of energy automation and technological processes, electrical energy efficiency and energy management. The interesting fact is that Schneider Electric has invested 8.5 million rubles in this project. The importance of the collaboration impress both heads of the collaborative organizations:

*"Mining, metallurgical, and petroleum industries are the most important for the Russian economy. They are the focus of Schneider Electric. Our company has a whole set of advanced energy-efficient solutions and extensive experience in various projects with major mining and oil companies around the world. We are happy to share our extensive experience and innovative technology with Russian students and specialists of the industry, facilitate scientific research and participate in research in the field of automation and energy management in Russia."* - says Johan Vanderplaetse, president of Schneider Electric in Russia. (Cited directly from St.-Petersburg Mining University, 2016)<sup>31</sup>.

*"One of our priorities is the integration of national experts in the international professional community; it is achieved by implementation of such projects as the new Center of Competence. It will improve the quality of student learning, increase the level of professional training of teachers, as well as specialists of oil and gas and mining companies that take refresher training courses at our university."* - says Vladimir Litvinenko, Rector of St.-Petersburg Mining University. (Cited directly from St.-Petersburg Mining University, 2016)<sup>32</sup>..

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<sup>31</sup> <http://old.spmi.ru/en/node/14322>

<sup>32</sup> <http://old.spmi.ru/en/node/14322>

This is an example of the joint benefits of the proposed model for the integrated centers of competences that could become a motor for the economic development and sustainability in Russia.

We made some proposals for increasing innovative capacities in local and regional levels as Integrated Distributed Centers of Competences within company, Innovative techno- business regional clusters, high skills Centers of Competences created at university level and business – university joint alliances. All these forms have practical applications in reality of Russia, but it requires more development, strategy and support to implement as a national idea of innovative development. One more aspect of increasing the innovative capacities within economy for the benefits of the micro and macro competitiveness is a creation of entrepreneurial universities. An example of the Perm National Research Polytechnic University, Russia was taken to support the practical case of the positive changes in innovation adaptation and development.

It is important to mention a valuable concept that is offered by Schaeffer and Matt (Schaeffer, Matt, 2016) to stimulate academic entrepreneurship by building and orchestrating the network of the stakeholders in the local system of innovation. Authors considered the University of Strasbourg case that aims to become a ‘hub’ university in a leading regional organization. This case speaks that even in different regions as Europe and Russia, the similarities of the stimulating academic entrepreneurship and architecture of the hubs into ecosystem have the same priority and necessity.

### **3 University as an integral part of the innovation chain: Entrepreneurial University. The Perm National Research Polytechnic University’s case study.**

Another example of the strategic vision to build a transition to a knowledge-based economy is the initiation of the entrepreneurial universities that will stand for science and commercialization process integration.

The Russian government has taken a number of steps to improve system of higher education lately and stimulates its involvement in solving urgent problems of building an "innovative economy". One of the steps taken in 2009 was the decision to create a new category of universities in Russia - National Research Universities (NRUs) as "higher educational institutions that equally effectively carry out educational and scientific activities based on the principles of integrating science and education." The most important distinctive features of the NRU are the ability to generate knowledge and provide an efficient transfer of technology to the economy.

The major indicators of effectiveness of NRU development programs in addition to the traditional indicators for educational and research activities, are indicators of innovative entrepreneurial environment created at the university. More specifically, the following should be attributed: the number of items of intellectual property registered in the reporting year; the number of small innovative enterprises established by NRU in the reporting year; the number of commercial enterprises, the founders of which are NRUs at the level of the blocking package; the number of new jobs created; income generated from research and development work (R&D) from all sources of the NRU including in the framework of international programs and projects; aggregated income from scientific and technical products sold by the research institution and organizations of its innovative infrastructure; involvement of the faculty and students of the university in the development of innovative entrepreneurship through grants, scholarships, bonuses and venture capital, etc.

The idea of entrepreneurial university comes up to the opportunity to expand innovative potential of the university through the establishments of Small Innovative Enterprises (SIPs) and the technology transfers through the university business incubator. The goal of entrepreneurial university is to ensure its self-development on the principles of business organization, research and entrepreneurship where innovation cycle will have stages from obtaining new knowledge to the commercial implementation in the profile market.

The case study of the Perm National Research Polytechnic University will stand as an example of the positive changes in innovative approach of Russian universities:

- Perm National Research Polytechnic University (PNRPU) is the oldest in the region and received its status as a “National Research University” in 2009 together with other 29 universities in Russia as a result of competitive selection. The Federal State Budget Educational Institution of Higher Education "Perm National Research Polytechnic University" was founded in 1953 with the priority of engineering studies. University has 9 faculties, 8 institutes, 7 centres for advanced training, 29 research and education centers, 36 teaching and research laboratories, 5 engineering centers (retrived from [www.pstu.ru](http://www.pstu.ru)).
- In 2015, “Perm Polytechnic” took 7<sup>th</sup> out of 140 places in the ranking of the most demanded engineering universities of the Russian Federation in the framework of the project "Social Navigator". In 2013, together with industrial enterprises of Perm region as JSC “Motovilikhinskiye Zavody”, OJSC “Avia-dvigatel” and OJSC “Sorbent”, PNRPU won the competition for the right to receive subsidies for the implementation of complex projects for the high-tech production. In 2007 PNRPU won the competition

of innovative educational programs of higher educational institutions within the framework of the priority national project "Education". In July 2012 the university was audited by TUV SUD Management Service GmbH which confirmed the ISO 9001:2008 standard for the second time.

Science and innovation play an important role in the Perm National Research Polytechnic University. The priority research areas of the university are "Aircraft engine and gas turbine technologies", "Mining and processing of oil, gas and mineral resources", "Nanoindustry", "Urbanistics" (retrived from www.pstu.ru).

To maintin different innovtive projects and colloborations the organizational structure for innovation policy was established (Fig. 1):

**Fig. 1: Organizational structure for innovation and innovation policy**

<b>THE COUNCIL OF SCIENCE AND INNOVATION</b>	<b>PRESIDENT OF SCIENCE AND INNOVATION</b>
<b>SMALL INNOVATIVE ENTERPRISES (SIP)</b>	
<b>SCIENTIFIC-RESEARCH DEPARTMENT</b>	Scientific centers and laboratories
	Unique scientific installations
<b>INNOVATION MANAGEMENT DEPARTMENT</b>	Department of Planning and Organization of Research and Development
	Department of target programs and projects
	Department of Legal Protection of Intellectual Activity Rights
	Department of Innovations
	Department of Innovative Infrastructure and Development
	Department of the Students Research work development
	Center for Scientific Publications
<b>INNOVATIVE CENTERS</b>	Center for Technology Transfer
	Student business incubator
	Technopark
<b>PUBLIC QUATERS</b>	Innovative cluster of student project groups
	„Entrepreneurial environment“ educational site
	Student Council
	Council of Young Scientists and Specialists of PNRPU

<b>SCIENTIFIC AND EDUCATIONAL SUBDIVISIONS</b>	Departments
	Faculties
	Institutes
<b>DEPARTMENT OF HIGH CADRE TRAINING</b>	
<b>DEPARTMENT of INTERNATIONAL RELATIONS</b>	

Scientific and research complex of the University includes 162 scientific and scientific educational divisions, namely:

- *Oil and Gas Institute;*
- *Institute of aircraft engine and gas turbine technologies;*
- *Institute of potassium;*
- *Institute of photonics and optoelectronic instrument making;*
- *Institute of safety, production and human;*
- *Institute of fundamental research;*
- *Institute of transport;*
- *Research Center for Powder Materials;*
- *Center for physical chemistry of high technologies;*
- *Science Educational Centre “Mathematics”;*
- *Science Educational Centre “Gas turbine technology”;*
- *Science Educational Centre “Integrated development of geographically-aligned deposits of ore and oil”;*
- *Science Educational Centre “Science intensive chemical processing technology of oil and gas”;*
- *Science Educational Centre of regional and urban planning;*
- *Science Educational Centre “Acoustics research, development and production of composite and sound-absorbing aviation constructions”;*
- *Science Educational Centre “Issues of automated technologies for system support of the life cycle of science intensive products at the enterprise "Proton-Motors”;*
- *Applied Chemical and Biochemical Research Centre*
- *Science Educational Centre “Nano-structured materials and products”;*
- *Scientific and Production Centre “Hi-tech mechanical facilities at Perm National Research Polytechnic University”;*
- *Research and Development Centre “Chemistry of New Substances”;*

- *Scientific Research Laboratory “Management and organization of energy-efficient activities”;*
- *Scientific Research Laboratory “Navigation Systems and Complex”;*
- *Scientific Research Laboratory “Systems and Water Technology” and more.*

Those subdivisions cited directly from Perm National Research Polytechnic University, 2017<sup>33</sup>

Such a ramified structure allows including into the science and innovation the different groups of residents as engineering students, employees-scientists of the university and business people-entrepreneurs. The residents are not only learning advanced experience but also come up with their own, new knowledge (Fig. 2).

**Fig. 2: Concrete outcomes and benefits of Entrepreneurial University**

Description	Results	Contact
Based on the brainstorming, Idea-lab initialization to create innovative projects based on the knowledge that has been obtained at the university	Generation Ideas Techniques Master classes and Trainings	School of Innovators
Based on conducting research and obtaining meaningful results, one can get advice on the protection of intellectual property rights. Young scientists are consulted on patenting and obtaining copyright certificates	Patents Registered Certificates	Department of legal protection of the results of intellectual activity
Based on the opportunity to participate in federal grant programs to finance the scientific research development	Consultations in the preparation of applications for grants Information about competitions	Department of target programs and projects
Based on assistance in integration into the international scientific community	Internships and exchange of experiences with foreign universities Studying in foreign partner universities	International Relations Department

Students who are planning to become entrepreneurs have a platform for meetings and informal communication with interesting people: entrepreneurs, business leaders and politicians, business experts on the basis of student business club "Business Environment". Also within the framework of this club, both students and scientists and entrepreneurs can be well

<sup>33</sup> <http://pstu.ru/en/research/centers/>

informed about the events: seminars, trainings, competitions on innovations, make useful contacts and get new knowledge and skills, consultations on entrepreneurial issues.

Students are able to complete the projects within the targeted entrepreneurial context and expert assessment in the framework of Interregional Competition Accelerator "Most Intelligent". Participants also have the opportunity to obtain expert support in drafting a business plan, consultations on various issues, access to information resources, assistance from established entrepreneurs; it is possible to attract funding through federal grant programs to finance their ideas as well as through the Department of Target Programs and Projects of the university.

Small innovative enterprises are created in cooperation with the University for the commercialization of promising scientific developments and research results. A registered start-up company can receive the status of a business incubator resident and receive a variety of support in development issues, such as project promotion, advising on project development issues, etc.

Perm National Research Polytechnic University develops a new format of the work -the technological platform. Currently, an important organizational stage is under way to determine the conditions for participation in and interaction with coordinators and managers of technological platforms. Recall that on April 22, 2011, Vladimir Putin signed a protocol (No. 2 dated 01.04.2011) on the approval of the list of technological platforms. It is planned that with its help the state will form thematic areas, within which priorities will be determined for carrying out various scientific research works. The results of these works are expected to be introduced into production and supported by government.

With the assistance of the innovation infrastructure PNRPU formed and implemented many corporate innovation projects during the last 5 years, among them:

- "Design and technological improvement of details and units of advanced aircraft engines due to large-scale introduction of polymer composite materials", state contract with the Department of Industry and Science of the Perm Region, head of Dr. of Technical Sciences, Prof. Tashkinov;
- "Diagnostic medical complex "Audiofluometer" for detection of diseases of the upper respiratory tract", state contract with the Department of Industry and Science of the Perm Region, head of the Dr. of Medical Science, Prof. Koryukina;
- "Formation of monocrystalline structure of low-carbon steels, diffusion and plasma coatings with a monocrystalline structure," Grant "Development of the scientific potential of higher education", head of the Dr. of Technical Sciences, Prof. Kleiner;

- "Creation of comprehensive normative legal and scientific and methodological support for increasing the efficiency of training highly qualified scientific personnel in the priority areas of science, technology and technology development in the system of" master's degree-postgraduate studies ", Grant "Development of the scientific potential of higher education ", the head of Dr. of Technical Sciences, Prof. Petrov;
- "Development and research of foaming fire-retardant ecologically safe materials with enhanced heat-shielding properties", state contract with the Department of Industry and Science of the Perm Region, head Prof. Vaisman;
- "Geological and economic assessment of the development of the territory of the Pre-Ural marginal trough (hydrocarbon raw materials)", state contract with the regional administration, the head of the Dr. of Geological and Mineralogical Sciences, Prof. Galkin;
- "Development and optimization of technologies for obtaining hardening and protective coatings," state contract with the Department of Industry and Science, head of the Russian Academy of Sciences, Prof. Antsiferov.

Not only scientists with a worldwide reputation, but also students master the basics of innovative projects, among them:

- Project "E5". Eco-container for waste paper collection – student Chudinova Y.N.
- Production of high-temperature ball valves with "soft" seals – student Karavaev D.M.
- Development of a bioengineering facility for cleaning and storing rainwater for the purpose of subsequent use – student Shchukin I.S.
- Creation of a hardening additive for a grouting mortar for fastening oil producing wells – student Ozhgibesov O.
- Development of technology for recycling wastes for preparation of recycled pulp to produce a pyrolysis fuel mixture – students team Monchenko SV, Dyakov MS, Shirinkina ES, Kzylbasov RA, and other projects.

Polytech university innovative activities aimed at positioning the university as a driver of formation of knowledge-based economy. It focuses on the organization of the transfer of intellectual activity in the economy and promotes the development of innovative products, including through the relations with development institutions and partner organizations, which are world leaders in high-tech and R & D industries. As an entrepreneurial university, PNIPU pays special attention to establishing mutually beneficial relations with the representatives of major Russian high-tech business, including through the establishment of joint-based departments.

Innovation ecosystem University PNRPU transmits the results of intellectual activities into the real economy through the mechanisms of technology transfer and commercialization. The university is successfully developing network partnerships with industrial companies, development institutions, technology platforms, clusters and other associations in the field of innovation.

The most important characteristic of the innovation ecosystem of PNRPU is the high level of entrepreneurial culture and a supportive environment for entrepreneurial abilities of students and university staff, expressed in number of employees of small innovative enterprises and start-up companies (plan: more than 70 in 2020) and the high proportion of students and staff involved in the innovation and entrepreneurial activity (plan: 25% in 2020).

Training of engineers in the basics of business and entrepreneurship provides meeting the needs in management and development of the creative cadre for economy and high-tech business. Favorable business environment that promotes the generation and implementation of new projects, first of all, the wide availability of material resources of the innovation infrastructure, including a business incubator, a startup accelerator, industrial park, shared centers for university teams, makes a eco innovation system be running properly. At the same time service divisions of innovative infrastructure ensures maximum availability of information and consulting and educational services in all areas of commercialization and technology transfer, with the involvement of the business community as mentors.

Activities in the field of innovation and entrepreneurship provide a significant contribution to strengthening the reputation of the Perm National Research Polytechnic University as an entrepreneurial university among the world's leading research and education centers.

## **Conclusion**

Given the residual challenges from the economic and financial crises of the last years, national and regional administration should seek to re-ignite economic growth, and to ensure sustainable high-quality life moving to an open and forward looking trajectory, strengthening strategic competence, introducing resilience into the innovation management systems, and proactively and competently seeking synergies between all part of innovation eco-systems.

Innovation is now recognized as the engine for increasing productivity and competitiveness of the economy that affect positively the level of economic growth. The leading role of knowledge, new technology, outgoing learning and up-to-date training are the major

factors to boost the competitiveness. In Russia, the necessity to improve a competitiveness of the national and micro-economy is high priority.

The proposal to establish an integrated Centers of Competence, Innovation Centers of business-university collaborations, innovation business regional clusters, high skills centers of competences at universities and other forms of cultivation of innovative development that will be effectively integrated among different industries with venture of science, research, universities for new applicable knowledge to be raised and implemented, will be working as the wheels to progress and move forward, for the purpose of sustainability of Russian competitiveness.

All over the world great importance is attached to the creation of national innovation systems linking science and business, which largely determines the country's competitiveness in the international market. Innovative activity, along with training and research, is proclaimed the third mission of universities. To strengthen the role of universities in the innovation process, it is necessary to fulfill the fundamental requirement - granting universities ownership of research results and the ability to effectively manage these rights in the commercialization process. Such changes will make higher education institutions more modern and dynamic without compromising traditional academic values. In this way with such universities of a new type that can be part of the structure of the university-technopolis, Russia will be able to stand up as a country of innovation and high-level competitiveness.

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## INNOVATIVE DEVELOPMENT FOR NORTHERN REGIONS: RUSSIAN CASE

Svetlana Panikarova – Maxim Vlasov

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### Abstract

**Purpose:** The aim of the research is an analysis of innovation environment of the northern regions and using it as the basis for identifying factors hindering innovation activities of the northern regions, as well as formulating ways of speeding up innovation development of the northern regions of Russia.

**Design/methodology/approach:** Methodological basis of the research is built on the algorithm of the knowledge index evaluation suggested by the World Bank; innovation development rating of the Russian Federation regions compiled by the Russian Academy of Public Economy and state service of the Government of the Russian Federation; Higher School of Economics, National Association of Innovations and Information Technology Development. Comparative evaluation of the level of innovation activity development in the northern regions of Russia was conducted, challenging points in the innovation development of the northern regions were identified, recommendations on improving efficacy of innovation activities of the northern regions of Russia.

**Findings:** Authors conducted analysis of northern regions innovation environment in order to evaluate context for creation and development of innovation activities. Knowledge index for northern regions was calculated on the basis of knowledge index evaluation algorithm suggested by the World Bank. Knowledge index evaluation allows for subdividing northern regions into four groups. In general, this method allows for identifying those Russian Federation regions that are most capable of creating, accepting and disseminating knowledge that is possessing innovation potential.

**Research/practical implications:** The authors identified main regional policy trends in the field of innovation development stimulation: 1. Implementing additional financial mechanisms of target industrial company support, 2. Forming new mechanisms of innovation projects financing, 3. Implementing major infrastructure projects aimed at uniting major enterprises, small businesses, research institutions and higher education institutions, 4. Creating institutional support for innovation policy, 5. Development of informational, expert – consulting and educational infrastructure for innovation activities.

**Originality/value:** Comparative evaluation of the level of innovation activity development in the northern regions of Russia was conducted, challenging points in the innovation development of the northern regions were identified, recommendations on improving efficacy of innovation activities of the northern regions of Russia.

**Key words:** Northern regions, Innovation development, Knowledge index

**JEL Codes:** R11, O31, O38

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## **Introduction**

In the context of new economic challenges, it is innovation development that provides sustainable development of economic agents inside the company and in the interaction with external environment, as well as be more effective in meeting the requirements in certain types of resources with the aim of the most optimal organization of production activities.

In their future research authors pointed out such peculiar aspects of northern regions of Russia development as prevailing mining industries; low population density and high population dispersion, high territory maintenance costs which predetermines low level of human capital and low innovation activity of economic agents of the northern regions of Russia (Panikarova, 2015).

Huge mineral and mining resources are one of the most important factors defining competitiveness and development of economics in the northern and arctic regions of Russia. Besides that some scientists think that at present mining industry can and must act as a driving force of innovation development of the Russian economy. This is determined by the following basic factors (Selin & Zukerman, 2013):

- mining industry in the northern regions are already high-tech an innovation – active;
- developing arctic shelf resources, including processing and transporting hydrocarbons requires new technological solutions on a large scale;
- mineral resources industries (corporations) have significant investment (financial resources necessary for strengthening innovation dynamics;
- the state has tools for influencing mining companies manufacturing orders among national companies including those based on product share agreements;
- northern regions are characterized by high qualification level of labour resources.

### **1 Main results of the research.**

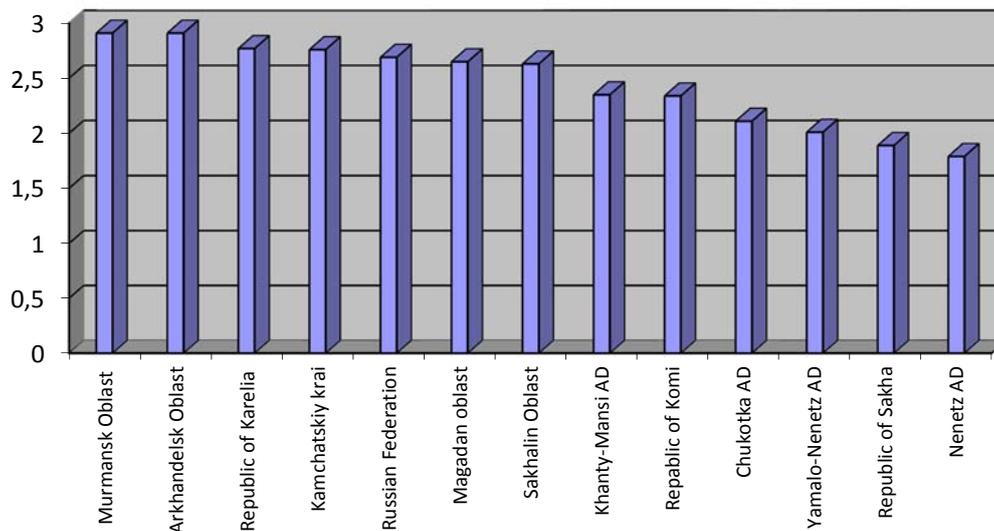
Authors conducted analysis of northern regions innovation environment in order to evaluate context for creation and development of innovation activities. Knowledge index for northern regions was calculated on the basis of knowledge index evaluation algorithm suggested by the World Bank.

Knowledge index is a complex economic indicator of country/region ability to create, accept and spread knowledge, and indicator of its overall potential for creating intellectual product. It characterizes potential of a country or a region from the point of view of knowledge economics.

Knowledge index is a mathematical average of scores the state gets in three variables in each of three areas: education and human resources; innovation scope; information and communication technologies. It also takes into consideration performance criteria of general economic and social situation.

As a result of calculations the authors received the following Knowledge index figure for northern region as compared to average numbers across Russia. (Figure 1).

**Fig. 1: Knowledge index for northern regions**



Knowledge index evaluation allows for subdividing northern regions into four groups. The first group features regions with innovation potential development higher than average Russian level: Arkhangel'sk and Murmansk oblasts, Republic of Karelia and Kamchatka. These regions have high financial potential for innovation development, but its results are one sided because of their mono – raw material specialization. Implementation of the innovation potential of these regions requires low financial costs, but takes special measures of innovation activity state support and can be organized during a short period of time.

The second group features regions with innovation potential on an average Russian level (Magadan and Sakhalin regions) but possessing certain natural and mining resources. With high financial costs innovation potential activation in these regions will take less resources and time than in the regions from the third and fourth groups with low innovation potential (Khanty – Mansi autonomous district and Komi Republic) or no innovation potential. The last group

includes 4 regions: Nenets autonomous area, Chukotsk autonomous area, Yamalo – Nenetsk autonomous area and Sakha Republic.

Therefore, in the nearest perspective northern regions from the first and second group have the necessary potential for innovation development. At the same time, most of the northern regions have such necessary resources for innovation development as strong scientific and technical potential and natural resources.

In general, this method allows for identifying those Russian Federation regions that are most capable of creating, accepting and disseminating knowledge, that is possessing innovation potential. Knowledge index describes starting conditions for technical progress, productivity growth and technology development, as well as provides environment for academic research and works leading to creation of new goods and processes.

When choosing innovation development trends, it is extremely important to conduct monitoring of country's regions innovation development in order to understand their potential in the field of creating or borrowing new technologies. Some regions of Russia can reproduce the growth model based on creating cutting-edge technologies, other regions can specialize in borrowing existing foreign technologies. This would facilitate diversification of country's innovation development leading to lower risks in implementing different innovation development trends.

There are many publications devoted to the topic of innovation potential changes, innovation development and innovation climate in different regions in Russia starting from 2005 when the policy of stimulating academic and technical development of the country entered its active stage. At present, there are different systems of region's innovation development evaluation aimed at defining leaders of innovation development in Russia (Bortnik et al., 2013).

Table 1 demonstrates main characteristics of ratings prepared by the specialists of the Russian Academy for Public Economy and State Service of the Russian Federation Government (RAPES), Higher School of Economics (HSE) and National Association for Innovation and Information Technology Development (NAIITD).

**Tab. 1: Main characteristics of innovation development ratings**

	<b>HSE</b>	<b>RAPESS</b>	<b>NAITD</b>
Name	Innovation development rating of Russian Federation regions	Innovation regions rating for management purposes	Innovation activity rating for Russian Federation regions
Chapters	1. Social and economic conditions for innovation activities. 2. Academic and technical potential of the region. 3. Innovation activities in the region. 4. Quality of innovation policy in the region	1. Potential of creating innovation. 2. Potential of innovation commercialization. 3. Innovation policy efficacy	1. Environment for innovation development; 2. Innovation production and use; 3. Legal environment
Number of performance indicators	36	16	Unknown
Method of calculation	1. Norm (linear scope method). 2. Level out (root of the N degree for lowering meaning asymmetry). 3. No scales. 4. Data for one year is considered	1. Norm (linear scope method). 2. Level out (root of N degree to lower meaning asymmetry). 3. Scales at chapters 0,3-0,2-0,5. 4. Data for two years is considered	1. Norm (linear scope method). 2. No leveling out. 3. No scales. 4. Data for one year is considered

Source: own elaboration

Most of the presented ratings use the approach of European innovation surveys (European Innovation Survey, Regional innovation survey and Union innovation survey) as a starting point. RosStat data was used as an information base for Russian regions.

Table 2 demonstrates position of the northern regions in the above-mentioned ratings for 2012.

**Tab. 2: Northern regions in the innovation development ratings for Russian Federation regions**

№ п/п	region	HSE		RAPESS		NAITD		average	
		Rank among RF regions	Rank among northern regions	Rank among RF regions	Rank among northern regions	Rank among RF regions	Rank among northern regions	Rank among RF regions	Rank among northern regions
1	2	3	4	5	6	7	8	9	10
1	Magadan region	21	1	33	2	73	9	42	3
2	Kamchatka region	23	2	58	6	40	2	40	1
3	Komi republic	34	3	49	3	50	5	44	2
4	Yamalo – Nenetz autonomous district	37	4	77	11	41	3	52	7
5	Murmansk region	40	5	56	4	61	7	52	5
6	Sakhalin region	45	6	57	5	77	11	60	8
7	Khanty – Mansi autonomous district	46	7	71	9	19	1	45	6
8	Arkhangelsk region	58	8	25	1	42	4	42	4
9	Sakha republic	66	9	63	7	70	8	66	9-10
10	Republic of Karelia	71	10	65	8	54	6	63	9-10
11	Nentz autonomous district	76	11	81	12	76	10	78	11
12	Chukotsk autonomous district	79	12	73	10	83	12	78	12

Source: own elaboration

As we can see from Table 2 position of the Northern regions in comparison to other regions of the Russian federation demonstrate significant differences in various ratings. It is particularly true concerning Magadan region (21st in HSE rating and only 73d in NAIITD rating) and Khanty Mansi autonomous area (19th in NAIITD rating and 71st in RAPESS rating). Researchers have similar opinions about such regions as Sakha (Yakuti), Nenetz and Chukotsk autonomous districts. According to the results of integrated evaluations northern regions lag behind mainly in innovation development. Comparison of the northern regions' position towards each other in the presented rating demonstrates significantly lower rating position spread in particular in terms of those regions lagging behind in innovation development (Sakha, Karelia, Nenets and Chukotsk autonomous districts).

Specific characteristic of the northern regions defining peculiar features of their innovation development is manifested in the following factors: resource economics; space burden and higher costs of territory maintenance (Ivanova & Shishaev, 2014).

Economics of northern regions is based on the work of major vertically integrated corporations whose interests are concentrated on mining and initial refining of natural resources. Slower mechanism of technological development of economics in resource – rich regions (Balatzky, 2012) is facilitated by “poverty trap” which implies formation of self-sustaining non-innovation functioning mechanism hindering technological modernization. Competition for investments from resource and innovation industries which demonstrate low level of hi-tech in resource mining both in Russia and abroad leads to technological stagnation and eventually to decreased internal market potential (Dementjev, 2014).

“Space burden” and high territory maintenance costs also predetermine peculiarities of economic relations in the northern regions as well as formation of regional policy (Ivanova & Shishaev, 2014). Low population density is one of the main factors of territorial development. For example, in Finland population density is 15 people per 1km<sup>2</sup>, in Murmansk region – 5,7, in Republic of Karelia – 3,79, and Chukotsk autonomous district has the lowest population density in Russia with 0.07 people per 1km<sup>2</sup>. Despite severe climate conditions the North has witnessed appearance of unique ethnic areas where Northern tribes found their ways of survival. Moreover, the presence of free space is vitally important for survival and self – sustenance of the northern peoples by means of using different natural resources, hunting, fishing, etc. However modern world requires considerable resources to maintain such territories. On the one hand mining and industrial expansion require expensive life support systems. On the other hand, development of peripheral territories and support of traditional ways require significant investments into modern equipment for fishing, snow transport, navigations systems, helicopter transport, etc.

Organization of low-developed northern territories economic space should meet the requirements of network effect described by A.N. Plilyasov (2009). Network effect in spatial economy is achieved in the process of interaction between various human, natural and financial resources of a vast area covering different cores united by migration, information, trade and financial currents. Network effect is in charge of maintaining and broadening diversity in economic activities. It has combinatory nature allowing for accidental mutations and unexpected outcomes that give rise to new ideas, technologies, business – processes. Achieving network effect is possible when developing communication and cooperation channels and forming overall basic institutions.

“Cost factor” of northern region innovation development can be seen in higher production costs too. These tendencies are proven by material and financial cost performance of production. According to evaluation data material costs of basic activities (natural resources mining, processing industry, construction, etc.) in the northern regions are 0.50 – 0.60. The most expensive area in terms of the materials for all the northern regions of Russia is production and dissemination of power, gas and water except in Chukotsk autonomous district. In some regions of the Russian Federation (Arkhangelsk and Murmansk regions) the figure for this area is 0.8. This type of activity is essential for life support of the population and organizations and has a direct influence on the productions costs for most type of products. Increasing share of outdated equipment leads to higher maintenance costs and decreased product quality. In terms of financial costs industry in the northern regions is more than twice less effective than that of developed countries.

In order to define the problem of the northern region innovation development we should come back HSE Russian Federation regions innovation development rating and analyse performance indicators reflecting individual chapters of the rating: social and economic environment for innovation activities; academic and technical potential of the regions; innovation policy quality in the regions (Table 3).

**Tab. 3: Indicators reflecting individual chapters of the rating: social and economic environment for innovation activities**

№	Region	Social and economic conditions		Academic and technical potential		Innovation policy quality		Innovation activities	
		Rank among RF regions	Norm indicator	Rank among RF regions	Norm indicator	Rank among RF regions	Norm indicator	Rank among RF regions	Norm indicator
1	2	3	4	5	6	7	8	9	10
1	Magadan oblast	65	0,33	12	0,43*	20	0,54	18	0,35*
2	Kamchatkyi krai	20	0,43	47	0,33	36	0,5	13	0,39*
3	Komi republic	52	0,36	23	0,4	28	0,5	63	0,23
4	Yamalo-Nenets autonomous district	14	0,45	68	0,27	22	0,52	55	0,25
5	Murmansk oblast	36	0,39	25	0,4	55	0,37	52	0,26
6	Sakhalin oblast	19	0,44	27	0,38	68	0,25	34	0,31
7	Khanty – Mansi autonomous district	9	0,49*	48	0,32	41	0,4	74	0,2
8	Arkhangelsk oblast	47	0,37	40	0,35	80	0,12	12	0,39*
9	Sakha republic	77	0,28	44	0,34	59	0,29	64	0,23

10	Republic of Karelia	42	0,38	41	0,35	75	0,13	67	0,22
11	Nenets autonomous district	69	0,31	83	0,15	69	0,25	34	0,31
12	Chukotsk autonomous district	78	0,28	77	0,22	82	0,13	40	0,28

\*Norm indicator is higher than average in the Russian Federation

Source: own elaboration

Detailed analysis of the indices allowed for identifying several narrow areas in the northern regions innovation development. For example the problem of Kamchatka region, Yamalo – Nenets and Nenets autonomous districts is related to the low index of academic and technological potential (including research financing, academic personnel, research results). Arkhangelsk and Sakhalin regions can facilitate innovation development by means of improving institutional support of innovation policy. Khanty – Mansi region can benefit from developing innovation activities (activities and results in the field of innovation, smaller innovation enterprises development).

Besides that there are problems typical of all northern regions which can be solved by means of regional innovation development:

- complex social economic innovation activity environment, including the need for lowering costs and renovating basic capital as well as upgrading quality of life for the population;
- low level of institutional support for innovation development related to the absence of necessary “bridges”, norms and rules for uniting individual organization inside the innovation system.
- several regions should do something about concrete problems of innovation development.

## Conclusion

The authors identified main regional policy trends in the field of innovation development stimulation:

1. Implementing additional financial mechanisms of target industrial company support including:

- provision of guarantees for loans taken for implementing production modernization and development priority projects;

- cover part of the expenses on maintenance of premises used by innovation infrastructure organizations;

2. Forming new mechanisms of innovation projects financing:

- creating venture funds with state participation;
- popularization of venture activities in entrepreneurial activities by means of “success stories” dissemination ;

3. Implementing major infrastructure projects aimed at uniting major enterprises, small businesses, research institutions and higher education institutions.

- creating and supporting functioning of technical pilot areas and innovation clusters;
- strengthening links between education and economics by means of creating integrated academic educational structures;
- forming innovation partnership between state, science, education and community.

4. Creating institutional support for innovation policy:

- developing legislation in the field of innovation activities;
- development and implementation of strategies and programs;

5. Development of informational, expert – consulting and educational infrastructure for innovation activities:

- creating effective innovation monitoring system allowing for formulating overall information system covering academic and innovation potential and innovation activities of branches and industrial companies on the basis of modern criteria and innovation activities performance indicators;
- supporting border cooperation;
- creating and supporting federal and regional database on research and academic works;
- creating special databases of innovation activities support services;
- creating multilevel life – long learning system in the innovation field and related process of forming innovation culture in academic and entrepreneurial communities.

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## CSR AND TAX PLANNING: CASE STUDY OF FOOTBALL CLUB

Igor Perechuda – Assidi Soufiene

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### Abstract

**Purpose:** Based on a review of recent literature, this paper presents the association between tax planning and Corporate Social Responsibility (CSR). Four dimensions of CSR were applied for this study: managerial, economic, social, and environmental. The study verifies the relation between CSR and tax planning in the aforementioned dimensions.

**Design/Methodology/Approach:** Research is based on the case studies of the Legia Warszawa Football Club Limited Company — one of the best Polish football clubs — during the period between 2011 and 2014 and the Legia Warszawa Football Academy Foundation during the same period. The football club was chosen due to strong relations between sports and CSR. The case study is based on a comparative dynamical and structural analysis of financial data. The fundamental for the case study was the review of previous literature and legal analysis.

**Findings:** This study shows how the company is committed to both social responsibility and tax planning. The case study confirms that CSR was performed in four dimensions. The confirmation was provided, described and analysed based on the business model of the chosen entity. Furthermore, it is possible to observe that performance of CSR is noticed mainly in the managerial and economic dimensions.

**Research/practical implications:** Due to the CSR activities performed and planned by the foundation, the company gained a wide range of benefits. Positive effects of CSR management and tax planning in the current case can be seen mainly due to the use of legal opportunities.

**Originality/Value:** The study proposes how the business model of the football club and foundation can achieve their common goals. It presents how economically important the cooperation between the foundation, which materializes the CSR activities, and the football club, a profit-making company, can be. The study also describes how it is possible to observe the relation between CSR and tax planning in case of the sports club.

**Key words:** Corporate social responsibility, tax planning, corporate finance, sport

**JEL Codes:** G3, M1

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## **Introduction**

Some researchers found contradictory results on the relation between CSR and tax planning (Issam et al., 2015; Lanis and Richardson, 2015; Watson, 2015). According to Lanis and Richardson (2012), tax planning is defined as the downward management of taxable income through tax planning activities. It thus encompasses tax planning activities that are legal or that may fall into the gray area, as well as activities that are illegal. Moreover, they argue that the term can be used interchangeably with tax avoidance and tax management. The goal of tax planning is to reduce the tax burden and is a part of business planning (Lanis and Richardson, 2012). The question raised in this study is as follows: Is Corporate Social Responsibility (CSR) associated with tax planning?

## **1 CSR dimensions**

Numerous theories have been applied to explain CSR, such as agency theory and stakeholder theory. Each theory elucidates the linkage between CSR dimensions and tax planning. The impact of CSR can be noted in the area of sports. Breitbarth and Harris (2008) proposed a conceptual model of CSR in professional football which outlines the agency role of football to create political, cultural, humanitarian and reassurance value. Moreover, the CSR activities in sports clubs are considered as factors that improve corporate value (Dimitropoulos and Vrontou, 2015). Many critics have long argued that investment in CSR is an unprofitable activity. Tax planning dimension is used as the dependent variable and the four CSR dimensions, social, managerial, economic and environmental, as independent variables (Dahlsrud, 2008; Johnson and Greening, 1999; Laguir and Elbaz, 2014).

### **1.1 CSR managerial dimension and tax planning**

There is a substantial body of academic literature that discusses tax planning, tax avoidance and corporate taxation from various perspectives (Hanlon and Heitzman, 2010). The issue is compounded by the complexity of national and international tax law; despite the clear theoretical boundaries, there exists a large grey area in practice between illegal tax evasion and legal tax planning (Christensen, 2011; Leite, 2012). Kim et al. (2012) found a positive relation between CSR and the earnings quality. Specifically, robust CSR performers are less inclined to manage earnings through discretionary accruals as well as to manipulate real operating activities. Managers use such accounting techniques to minimise tax and guarantee tax benefits while shielding such actions from the tax authorities (Desai and Dharmapala, 2009). Barton et

al. (2015) show that CSR allows to manage earnings in a manner that meets the analysts' forecasts and reduces financing and tax costs. This evidence is consistent with CSR exhibiting more reasonable motives for incomes management. Hence, CSR can be used as a space covering strategy to divert attention from a firm's earnings management behaviour. Companies should engage in responsible tax planning as it is consistent with their own goals and strategy.

*H1. The CSR managerial dimension of a firm has an influence on the level of its tax planning.*

### **1.2 CSR economic dimension and tax planning**

The economic dimension of CSR in sports is noticed particularly in research concerning sport satellite accounts (Ahlert 2013). Taxation has a significant importance in the firm's decisions; therefore, the theoretical model presented in this study is based on the premise that the different dimensions of CSR have different effects on tax planning. Watson (2015) showed that the relation between CSR and tax planning depends on the performance of earnings.

*H2. The CSR economic dimension of a firm has an impact on tax planning.*

### **1.3 CSR social dimension and tax planning**

Some academics argue that corporate culture reduces the agencies' problems (Van den Steen 2005). The notion of culture is a tool that can define the appropriate corporate behaviour which could serve the interests of shareholders by facilitating coordination within the firm and reducing the transaction costs (Hermalin 2001). Hasseldine and Morris (2013) see taxation largely as a legal and technical issue that has a very limited role in CSR, while Sikka (2013) perceives taxation among the broader socio-political questions of ethics, social power and state sovereignty and, hence, argues that taxation should be considered to be at the very core of the debate on CSR. Laguir et al. (2015) showed that tax planning of firms depends on the nature of CSR activities. Specifically, there is an inverse proportionality between CSR and tax planning (the higher the level of the CSR social dimension, the lower the level of tax planning and vice versa).

*H3. The CSR social dimension of a firm has an influence on tax planning.*

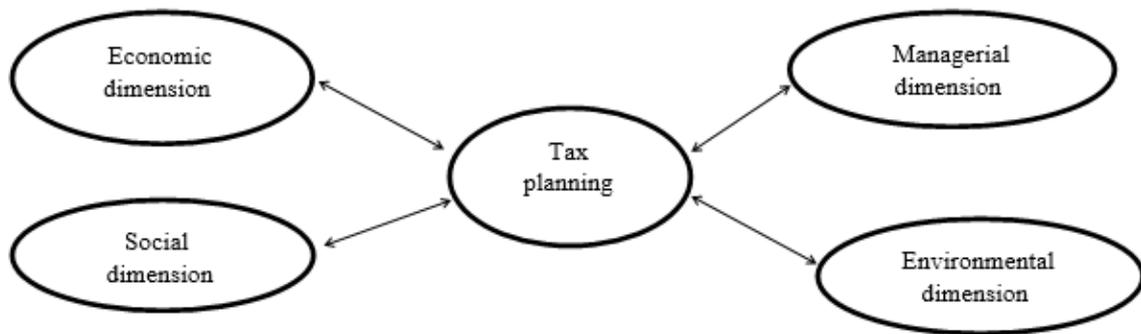
### **1.4 CSR environmental dimension and tax planning**

Numerous studies indicate that corporate sustainability and CSR by voluntary disclosures of all documents related to the environment may help inform all stockholders about the situation and persuade management to conduct tax planning and provide a transparent account of activities (e.g. Boiral, 2013). However, the disclosure of any information about tax has an effect on firms.

Margolis et al. (2007) reviewed an extensive management literature on CSR and concluded that there is mixed evidence on the relation between CSR activities and shareholder value.

*H4. The CSR environmental dimension of a firm has an influence on tax planning*

**Fig. 1: Theoretical framework and model**



Source: Own Elaboration.

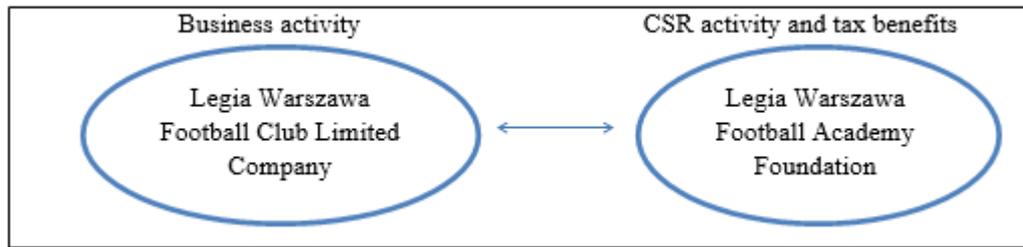
## 2 Case setting, data and research method

In our study, we consider the Legia Warszawa Football Club Limited Company, which is considered to be an enterprise that validates our theoretical framework. This company was chosen because professional football clubs as a type of business activity relate with all the variables of our study, and they are profit-oriented organisations with a wide range of CSR activities. Some researchers have already chosen case study as a research method for CSR in sports (Breitbarth and Harris 2008). The data was obtained from the financial reports and documents specific to the firm.

### 2.1 Legia Warszawa Football Club Limited Company

Some football companies operate on a business model built from two units: a football club and a foundation. This is the case with most European football leagues, such as Spanish, German, English and Polish. This kind of business model needs to be analysed in the study as a model for one organisation. From the Polish league, we have chosen the Legia Warszawa Football Club. The club is registered as a limited company in Warsaw. In 2008 the club formed a foundation called *Fundacja Akademia Piłkarska Legia Warszawa* (eng. *Legia Warszawa Football Academy Foundation*). Business model of this organisation is illustrated in the figure below.

**Fig. 2: Legia Warszawa Business Model**



Source: Own Elaboration.

## 2.2 Data and methodology

The study draws on the qualitative research tradition to explore the connections between tax planning and CSR disclosures. According to Bedard and Gendron (2004) 'qualitative research often is the most effective method to conduct empirical investigations aimed at better understanding phenomena occurring in their natural context'. Due to limitations on the availability of data on corporate tax avoidance practices (Lisowsky, 2010; Sikka and Willmott, 2010; Wilson, 2009), it is considered useful to employ a qualitative approach to illustrate the inherent complexities of these organisational practices. In the present study, we have been able to tackle the research problem to a large extent.

## 2.3 Legal and tax conditions

In accordance with tax regulations and provisions of the sports act, the permitted form of taxation in legal forms concerning economic activity in Poland is a 19% flat-rate tax. The tax is calculated on the income (the profit) determined based on a revenue and expense ledger or an account book. Regardless of the amount of income, the monthly withholding paid to the tax office is set at a fixed rate of 19%. This means that regardless of the declared result of a business, 19% of the result is always paid as income tax (Act of law on Legal Persons' Income Tax, 2014).

The following sources of finance and revenue can be distinguished by a foundation according to legal regulations in Poland: subscription fees, donations (money and physical goods), grants from public and private sources, sponsoring, 1% personal income tax deductions (for organisations having the status of public benefit organisations), fund-raisers, campaigns, earnings from the organisation's assets, capital investments, penalty assessments, earnings from payable public benefit activity, earnings from economic activity, inheritances, bequests and other sources (credits, loans, etc.) which are available to a foundation in a limited form.

This means that the business model of Legia Warszawa can generate revenue as it is exempted from taxes in some cases. In this case, the foundation is taxable under the provisions of the corresponding act (The Income Tax Act of 2014). The act defines a fixed catalogue of activities for which the income of a foundation will be exempted from tax, provided their statutory goals are among those mentioned in the act. The main regulation regarding corporate income tax exemption is Article 17, Paragraph 1, Subparagraph 4 of the Legal Persons' Income Tax Act (Act of law on Legal Persons' Income Tax, 2014). Thus, the entities whose income is exempt from income tax are those whose statutory goals are the following: scientific and technical activity; educational activity, including the education of students; cultural activity; physical education and sports activity; environmental protection; supporting social initiatives for the construction of roads and telecommunications networks in villages and supplying villages with water; charity; health care and social service; occupational and social rehabilitation of the disabled and religious activity.

According to the above regulations, activity related to sports and the activities of sports clubs can be exempt from tax under certain circumstances. Subparagraph 5a of the aforementioned article states that corporate income tax exemption applies to 'the income of sports clubs, referred to in the sports act of June 25, 2010 (O.J. 2014, pos. 715), intended for and expended in the fiscal year or the year following it on sports training and competition of children and youth in the age categories up to 23 years old' (Act of law on Legal Persons' Income Tax, 2014). It means that the Legia Warszawa Foundation has the right to be free of corporate income tax in training young players. The Legia Warszawa Limited Company is one of the best football clubs in Poland. Their model of activity is more commercial and less sport-oriented. The club acts as a normal enterprise with three sources of income:

- (1) TV broadcasting (selling rights to TV station)
- (2) match day (tickets, income generated during sports events)
- (3) commercial activities (income from services like sponsoring, sale of goods like T-shirts and others).

These sources are fundamental to the functioning of the club and are the reason for increasing its income. Although, as long as it is a sports club, it has a wide range of activities with high social impact. In this case, majority of the social activities, which can be interpreted as CSR activities, are performed by the foundation of the club. These activities are as follows (Financial reports of Fundacja Akademia Piłkarska Legia Warszawa, 2011, 2012, 2013, 2014):

- (1) organising, financing and conducting youth football team matches;

- (2) organising and financing the training of youth in the field of football;
- (3) financing and organising trips to tournaments;
- (4) organising and financing sports events;
- (5) organising and financing activities to help children and youth talented in sports;
- (6) financially supporting entities operating for public benefit and facing financial difficulties;
- (7) financially supporting individuals facing financial difficulty.

All the above activities could be performed by a limited company as well; however, when performed by a foundation, they gain additional revenues mentioned earlier in this study and also gain the status of non-taxable income. Furthermore, the foundation occupies itself with the following non-payable charitable activities for which it gains special income from the 1% personal income tax deductions (for organisations having the status of public benefit organisations):

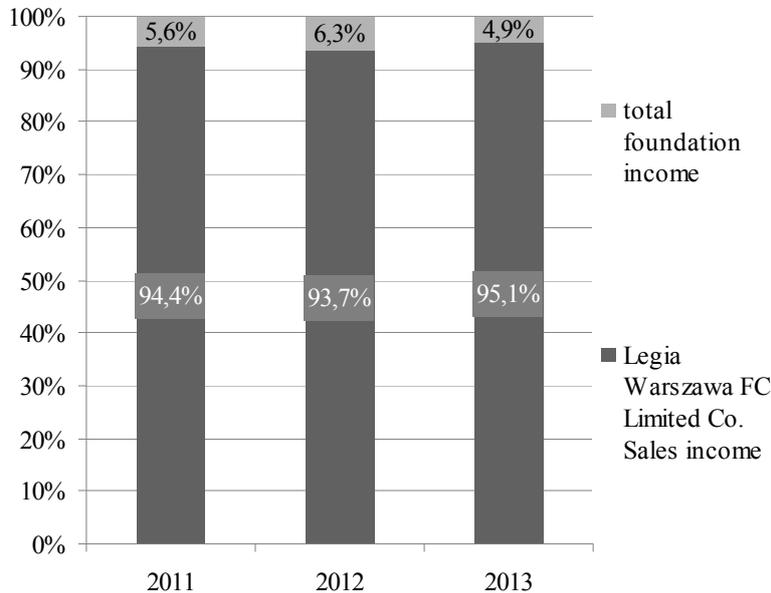
- (8) promotion of sports events;
- (9) organising meals for children and young people from poor families;
- (10) providing financial and in-kind support for gifted children and young disabled people; providing counselling and educational socialisation for people from dysfunctional families;
- (11) organising and financing health care and physical therapy for children and adolescents talented in sports;
- (12) organising and financing psychological and pedagogical assistance; counselling in education and employment for young people talented at sports;
- (13) organising courses, various sports and recreational activities for groups and individuals and training for a staff of instructors to work with children and youth.

### **3 Research results**

In the appendix, we present the revenue data of the foundation in three areas of activity. The data shows that the share of income from statutory non-payable charitable activities, linked with CSR activities of the foundation, is at 15% of the total income. The foundation gave Legia Warszawa an opportunity to generate additional tax-free revenue. In addition, if the income from economic activities will be planned for the next year as statutory objectives, the activities will be non-taxable as well. To demonstrate that the CSR activities are an important support for

financial planning, we should compare total income of the Foundation with the total income of the Legia Warszawa Limited Company.

**Fig. 3: Structure of income in Legia Warszawa Business Model in %**



Source: Own Elaboration.

The income shares of the Legia Warszawa Limited Company and the foundation's income share of the business model as a whole are presented in Fig. 3. During the three years of activity, the income share of the foundation was approximately 5% to 6% of the total income. This income is inclusive of all three sources of income. We observed that the foundation's income was increasing with the increase in the football club's income (Table 1 and Table 2). It means that if the company develops its core business activities, the CSR activities will be in constant relation with the overall business model and will develop alongside it.

**Table 1: Structure of income in Legia Warszawa Business Model in PLN**

		2011	2012	2013
Legia Warszawa FC Limited Co.	Sales income	65 002 950	66 374 000	92 144 667
Legia Warszawa Foundation	Income from foundation's statutory activities	3 547 373	823 343	770 711
	Income from foundation's economic activities	341 191	3 604 105	3 993 770
	Foundation's total income	3 888 564	4 427 448	4 764 481
Total		68 891 514	70 801 448	96 909 148

Source: Own Elaboration.

The above data shows the income structure of the business model in Legia Warszawa. About 5% of the income generated from core operations in the organisation comes from the foundation. It means that CSR activities performed by the organisation increase the total income by 5%. It is the effect of the following few factors related to tax and financial planning:

- (1) gaining extra non-taxed income due to the foundation's CSR activities;
- (2) obtaining 1% personal income tax deductions;
- (3) building of own assets (training of players by the foundation) by way of CSR activities;
- (4) Construction of the business model based on legal possibilities confirms the hypothesis (H1) that the CSR managerial dimension of a firm (in this case study mainly construction of business model) has an influence its level of tax planning. Moreover, the income structure data and analysis of key factors of income benefits in this case confirms the hypothesis (H2) that the CSR economic dimension of a firm has an impact on tax planning and the hypothesis (H3) that the CSR social dimension of a firm has an influence on tax planning.
- (5) Regarding the hypothesis (H4) that the CSR environmental dimension of a firm has an influence on tax planning, in the present case study, we only notice that the foundation registered a special operating area, helping people during or after a natural disaster. However, it is only registered for an event which did not occur in the chosen case. Moreover, there is an influence of the environment on the physical condition of people who are strongly related with the activities of Legia Warszawa. A longer life with good health is constructive for the social environment in general (European Commission, 2015).

- (6) The case study shows that companies engage in responsible tax planning because it is related with their own goals and strategies. The goal of tax planning is to obtain financial and organisational benefits. To achieve these goals, companies use legal methods. Because both taxation and CSR constitute a diversion of resources toward non-shareholder stakeholders, the link between CSR and tax planning has drawn considerable interest.
- (7) We can observe a positive relation between the increase in income of the Legia Warszawa Limited Company and the increase in income of the Legia Warszawa Foundation.

## **Conclusion**

In the present case study, the construction of the business model confirms that CSR, which includes four dimensions (managerial, economic, social and environmental), has an influence on the level of tax planning. It is worth noting that the conducted research needs further qualitative verification in other cases. However, this research formulates the initial assumptions for further research. First, the relation between the managerial dimension of CSR and tax planning is explained using the strategies of the manager in tax planning by exploiting the benefits granted by law. Provided analyses in this dimension developed practical and literature studies on accounting and law techniques to minimise tax and guarantee tax benefits and to incomes management (Desai and Dharmapala, 2009; Watson 2015). Second, the relation between the economic dimension of CSR and tax planning is explained by the role of the foundation in economic activity and tax exemption. Verification of this relation is the main contribution of the study. Collected financial data and provided law acts analyses explain economic dimension of CSR and tax planning. In addition, regarding the relation between the social dimension of CSR and tax planning, we noticed that the foundation registered a special operating area helping people in the event of natural disasters. Finally, the relation between the environmental dimension of CSR and tax planning is based on the activities of this company, such as promotion of health among certain categories such as football players and it was already noted in literature by Breitbarth and Harris (2008). The last two dimensions should be analysed in more cases and need stronger confirmation with respect to the collected data. In the presented results, based on the collected data, we observe the relation between managerial and economic dimensions of CSR and tax planning. Moreover, based on the legal act analysis and the Legia

Warszawa Business Model we can assume that functioning in this model can enable delivering to the stakeholders a wide range of benefits that are not easily observable in financial data.

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## Appendix:

**Table 2: Structure of Foundation activity**

data in PLN	2011	share in total	2012	share in total	2013	share in total	2014	share in total
income from statutory non-payable charitable activities	3 376 792	87%	710 059	16%	649 661	14%	823 938	15%
costs from statutory non-payable charitable activities	2 977 886	91%	861 770	23%	814 867	19%	1 325 262	23%
Results	398 906	65%	- 151 711	-21%	- 165 206	-37%	- 501 324	163%
income from statutory payable activities	170 581	4%	113 284	3%	121 050	3%	89 905	2%
costs from statutory payable activities	255 814	8%	361 446	10%	323 044	7%	259 544	5%
Results	- 85 233	-14%	- 248 162	-35%	- 201 994	-46%	- 169 639	55%
income from economics activity	341 191	9%	3 604 105	81%	3 993 770	84%	4 452 292	83%
costs of economics activity	36 939	1%	2 497 622	67%	3 184 917	74%	4 089 650	72%
Results	304 252	49%	1 106 482	157%	808 853	183%	362 641	-118%
Total income	3 888 564	100%	4 427 448	100%	4 764 481	100%	5 366 134	100%
Total costs	3 270 639	100%	3 720 839	100%	4 322 828	100%	5 674 456	100%
Results	617 925	100%	706 610	100%	441 653	100%	- 308 322	100%

Source: Own Elaboration.

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## REGIONAL ASPECTS OF INCLUSIVE ENTREPRENEURSHIP IN SLOVAKIA: GEM EVIDENCE

Anna Pilková – Juraj Mikus – Marian Holienka

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### Abstract

**Purpose:** Entrepreneurship is an important phenomenon and a promising key to economic growth and job creation especially for underrepresented groups, not only on aggregate level but also in the regional context. However, a comprehensive picture on its inclusivity across Slovak regions is still missing. The main aim of our paper is to analyze regional differences of inclusive entrepreneurship in Slovakia with special focus on women, youth and seniors in relation to regional macroeconomic characteristics and attitudes towards entrepreneurship.

**Design/methodology/approach:** Our analysis is built on data from Global Entrepreneurship Monitor (GEM). We have created a pooled sample from Slovak individual-level data from years 2011 to 2016, comprising of 12,010 adult population individuals. For each year, the sample is representative for gender, age and regional distribution. Eight NUTS3 level regions are considered in our study. To group regions according to patterns of their entrepreneurship inclusivity and analyze them in the context of economic and cultural attributes, we employ a cluster analysis followed by respective methods of descriptive analysis and data visualization.

**Findings:** The level of inclusive entrepreneurship varies across Slovakian regions. Women are most intensely involved in Bratislava region, while inclusivity of both seniors and youth is the highest in Trencin region. Our findings confirmed that economic power goes hand in hand with increased opportunity perception, high entrepreneurial self-confidence, the lowest fear of failure, but also not positive social attitudes towards entrepreneurship. This environment particularly encourages female into entrepreneurship, but at the same time it is not able to outweigh inhibitors of seniors' and youth inclusivity. On contrary, youth and seniors' entrepreneurship inclusivity is higher in regions with lower economic power.

**Research/practical implications:** Based on our findings, we develop recommendations for policy makers how to shape entrepreneurship support policies and actions in regions to best fit the specifics of the inclusivity, considering females, youth and seniors. We identify the most underrepresented and vulnerable groups, and, where necessary, stress the main implications for further inquiry.

**Originality/value:** Our paper creates an original value by providing a unique insight on inclusivity of entrepreneurial activities thanks to breaking down the GEM-based analysis of female, youth and senior entrepreneurship to regional levels, and linking it to economic and cultural dimensions. To our knowledge, there is no previous analysis built on unique, representative and robust data from all regions of the country.

**Keywords:** entrepreneurship, inclusivity, regions, age, gender

**JEL Codes:** L26, R12, J01

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## **Introduction**

Entrepreneurship is a complex subject and has been studied from different perspectives. During the last decades, academic interest in both the subject of entrepreneurship and regional entrepreneurship increased considerably (Sternberg, 2009). Common outcome of these studies is that region matters in understanding and explanation of differences in level of entrepreneurial activity (Bosma, 2009; Sternberg, 2009; Fritsch and Mueller, 2006; Tamásy, 2006). However, according to literature review there are still gaps not only in terms of adequate regional theories of entrepreneurship but also as far as studying inclusive entrepreneurship from regional perspective is. So far, there are numerous empirical studies on regional entrepreneurship particularly in Germany, Spain and Holland. Many of them are focused on regional entrepreneurial environment and regional entrepreneurial activities, attitudes, macroeconomic indicators etc., but specific studies on inclusive entrepreneurship are rare. Inclusive entrepreneurship represents involvement of under-represented or disadvantaged groups in entrepreneurial activities, leading through unleashing their creative potential towards the economic self-sufficiency that is beneficial for themselves and for society. However, the concept and practice of inclusive entrepreneurship are complex, multidimensional, with many specifics both on national and regional levels. Due to that contribution to its better understanding also by academic research is inevitable. As comprehensive picture of entrepreneurial inclusivity across Slovak regions is missing we did research on eight regions from this perspective. The main aim of our paper is to analyze regional differences of inclusive entrepreneurship in Slovakia with special focus on women, youth and seniors in relation to regional macroeconomic characteristics and attitudes towards entrepreneurship.

## **1 Literature review**

Research studies on regional (sub-national) context of entrepreneurial activity confirmed that region matters for individual's decision to be engaged in entrepreneurship (Wagner and Sternberg, 2004; Tamásy, 2006; Sternberg, 2009 etc.). It has been also discovered that entrepreneurial activity is extremely unevenly distributed over regions (Sternberg, 2009, Audretsch and Fritsch, 2002 etc.).

Based on review of the empirical studies Bosma et al. (2008) present three main categories of regional determinants of new firm formation: demand and supply; agglomeration effects and policy environment and culture. The demand side relates to population growth, income and profitability which relates to industry diversity and size structure (Reynolds, et al.,

1994; Fotopoulos and Spence, 1999). The supply side is influenced by effects of the unemployment even its impact according to research studies are different. Unemployment may increase self-employment rate as people don't have other option (Reynolds et al., 2002). However, high unemployment rates can reflect unfavorable economic conditions which might be a barrier for new entrepreneurial activity (Grilo and Thurik, 2005). The size and structure of the local population and labor market as far as education, age, gender and ethnic origin also matters to firm creation (Clark and Drinkwater, 1998). As far as agglomeration effects are they can be split in localization and urbanization economies. Localization economies arise when firm's active within the same industry are located near each other and may even have positive impact on growth of innovative firms (Nystrom, 2005). Urbanization economies emerge from mere location near other firms regardless of their industry type. This generates a rich variety of contacts and can create the variation of entrepreneurial activity across regions through peer effects (Nanda and Sorenson, 2007), knowledge spillovers (Audretsch and Feldman, 2004), networking (Sorenson, 2003; Malecki, 2007 etc.). The third group of regional determinants of firm creation is policy environment and culture. Researchers found positive impact of local policy environment on regional differences of entrepreneurial activities (Sutaria and Hicks, 2004; Davidson, 1995). According to assumption that cultural differences among regions might have positive impact on explanation of different entrepreneurial activities in regions, Davidson and Wiklund (1997) found some contribution of cultural differences in explaining regional variation in creation of new firm in Sweden. Also, often quoted work of Tamasy (2006) revealed a significant contribution of several entrepreneurial attitude indices to entrepreneurial activity. But according to Bosma and Schutjens (2011), is not clear cut between entrepreneurial attitudes and activities at regional level. In their work, they addressed entrepreneurial attitudes (informal institutions), urban context (population density), in-migration, regional policy programs and industry structure as key factors that should influence the early stage entrepreneurial activity (TEA).

## **2 Methodology and Data**

Our analysis is based on GEM Adult population survey (APS). We use APS data on entrepreneurial attitudes and activity from representative adult population samples (18 to 64 years). We have created a pooled sample from Slovak Republic individual-level data from years 2011 to 2016 comprising of 12,010 adult population individuals. For each year, the sample is

weighted to be representative for gender, age and regional distribution. Eight NUTS3 level regions are considered in our study.

At the *first stage*, we have analyzed a level of inclusive entrepreneurship of youth (age 18-34), women and seniors (age 55-64) at each of the eight regions applying own developed TEA inclusivity index, the calculation of which is following:  $TEAI_{jk}$  is the summary inclusivity index of individual category  $j$  of population (youth, women, seniors) for the region  $k$ ,  $TEAI_{jki}$  is the inclusivity index in the year  $i$ , region  $k$  and  $n$  is the number of years:

$$TEAI_{jk} = \left( \sum_{i=1}^n TEAI_{jki} \right) / n$$

$TEAI_{jki}$  - the TEA inclusivity index in the year  $i$ , for particular category of population  $j$  in region  $k$  is calculated as follows:

$$TEAI_{jki} = (TEA_{jki} / TEA_{ki})$$

Where  $TEA_{ki}$  – percentage of population 18 - 64 who are nascent or new business owners (up to 42 months' businesses);  $TEA_{jki}$  is percentage of population of particular category  $j$  (women, youth, seniors) in region  $k$  and year  $i$ .

In the *second stage* using the  $TEAI_{jk}$  as a main variable, we implement Agglomerative Hierarchical Clustering (AHC) to divide 8 regions into 3 clusters based on inclusivity indices of women, seniors and youth. In the AHC approach we start by defining each data point (inclusivity index) to be a cluster and combine existing clusters at each step. For doing it we apply Ward's Method. This method does not directly define a measure of distance between two points or clusters. It is an ANOVA based approach. At each stage, those two clusters merge, which provides the smallest increase in the combined error sum of squares from one-way univariate ANOVAs that can be done for each variable with groups defined by the clusters at that stage of the process.

In the *third stage* the constructed clusters are further analyzed according to the selected macroeconomic indicators and indicators of social attitudes toward entrepreneurship.

### 3 Results and discussion

The values of inclusivity indices for the analyzed disadvantaged groups – seniors, women and youth, in Slovak regions during the period of years 2011 to 2016 are displayed in Tab. 1.

**Tab. 2: Inclusivity indices for seniors, women and youth in Slovak regions, 2011-2016**

Region	Bratislava	Trnava	Trencin	Zilina	Presov	Kosice	B. Bystrica	Nitra	Slovakia
<b>Seniors</b>	0.40	0.35	0.64	0.40	0.52	0.46	0.43	0.33	<b>0.44</b>
<b>Women</b>	0.84	0.70	0.59	0.50	0.66	0.65	0.68	0.78	<b>0.67</b>
<b>Youth</b>	1.12	1.10	1.30	1.21	1.10	1.20	1.26	1.20	<b>1.19</b>

Source: GEM 2011-2016, own elaboration by authors

The level of inclusive entrepreneurship varies across the analyzed regions. In case of seniors, the higher inclusivity index was observed in Trencin region (0.65), whereas the lowest inclusion was found in Nitra and Trnava regions (0.33 resp. 0.35). Women are most intensely involved in early-stage business in Bratislava region (0.84), while in Zilina region their inclusivity index dropped to 0.50 only. Finally, youth population exhibited higher inclusivity (compared to overall adult population) in all Slovak regions, peaking in Trencin region (1.30) and reaching the lowest values in Trnava and Presov regions (1.10 for both).

Cluster analysis led to formation of three clusters (Tab. 2) exhibiting different patterns of inclusive entrepreneurship. These patterns are visualized on Fig. 1 below.

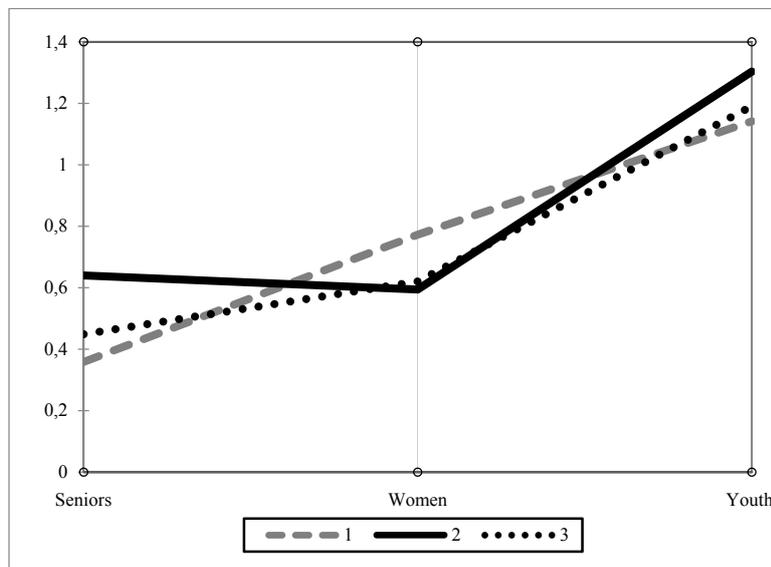
**Tab. 2: Slovak regions grouped into clusters according to inclusivity indices**

Cluster	Cluster members
Cluster 1	Bratislava, Trnava, Nitra
Cluster 2	Trencin
Cluster 3	Banska Bystrica, Zilina, Presov, Kosice

Source: own elaboration by authors

Results plotted on Fig. 1 clearly illustrate patterns of inclusivity of seniors, women and youth. Cluster one (comprising of Bratislava, Trnava and Nitra regions) exhibits the highest inclusivity of entrepreneurship within female population (cluster's centroid: 0.78), but, at the same time, lowest inclusivity levels of seniors (0.36) and youth (1.14). Cluster two (Trencin region) exhibits a specific shape due to relatively high inclusive index value for seniors (0.64) that even outperforms inclusivity of female population (0.59), as well as high involvement of youth in early-stage business (1.30). Finally, cluster 3 (includes Banska Bystrica, Zilina, Presov and Kosice regions) is characterized by a pattern where inclusivity of youth is the highest (1.19), followed by inclusivity of female populations (0.62) and seniors (0.45).

As the main aim of our study is to identify and analyze the regional differences in inclusive entrepreneurship, we focused on their interpretation in the context of macroeconomic characteristics (Tab. 3) as well as informal cultural elements (Tab. 4), represented by attitudes towards entrepreneurship, and found several interesting connections.

**Fig. 1: Cluster 's profile plot: inclusivity indices for seniors, women and youth**


Source: own elaboration by authors

**Tab. 3: Inclusivity-based cluster's economic characteristics**

Slovakia Regions	GDP per Capita	Average GDP Growth	Unemployment Rate	Share of Employees Living in Area		Population Density	Average Gross Income
				Urban	Rural		
<b>Cluster 1</b>	19983	3.51	9.3	65.3%	34.7%	180.9	982
<b>Cluster 2</b>	11825	2.19	10.3	57.3%	42.7%	131.6	813
<b>Cluster 3</b>	9956	3.08	17.7	55.3%	44.7%	94.9	768

Source: Eurostat, Central Office of Labour, Social Affairs and Family, own elaboration by authors

First, the economically most developed and most urbanized Cluster 1 (with clearly highest GDP per capita, average income, and lowest unemployment rate) is characterized by highest inclusivity of female entrepreneurship among the three clusters, and, at the same time, lowest inclusivity rates of seniors and youth. Thus, it seems that economically sound regional environment encourages and pulls more female to start engagement in business activities. We might also expect that within such context, opportunity motive shall prevail necessity-driven efforts. On contrary, economic power creates increased employment opportunities (in terms of variety, quantity and incomes) that might attract more young people to become employees instead of starting their own business, compared to economically less sound regions. Accordingly, economic power perhaps also slightly inhibits senior involvement in early-stage business, especially its portion driven by necessity, as 50+ are more likely to preserve their jobs

(e.g. due to more stable employment and lack of free workforce), or in case they lose one, to find other solutions with support of their families. Our assumptions regarding youth and senior regional inclusivity drivers are also supported by the fact that highest levels of inclusivity were observed in Cluster 3 regions, with clearly highest unemployment rate, lowest GDP per capita and income, where we expect increased share of necessity motive.

**Table 4: Values of social attitudes for 2011 – 2016 in Slovak regions by clusters**

	Perceived opportunities	Entrepreneur skill	Fear of Failure	Media Attention	High Status in Society	Good Career Choice
Cluster 1	28.8%	53.2%	47.0%	54.9%	62.5%	47.7%
Cluster 2	23.5%	48.6%	48.5%	54.6%	62.3%	50.1%
Cluster 3	16.8%	49.8%	49.3%	56.2%	64.3%	51.9%

Source: GEM 2011-2016, own elaboration by authors

Second, we observe a clear pattern of increasing opportunity perception with the growing economic power across clusters. Therefore, we expect that the effect of economic power goes hand in hand with increased perception of good business opportunities, especially in encouraging female entrepreneurship driven by opportunity, decreasing necessity motives of seniors to start own businesses, and reflecting good employment opportunities that attract part of the youth's potential entrepreneurship capacity. Besides opportunity perception, Cluster 1 also outperforms in aggregated entrepreneurial self-confidence (i.e. perceived entrepreneurial skills). Thus, it seems to be important for encouraging female entrepreneurship, but not able to outweigh the economic effects inhibiting seniors' and youth inclusivity. Finally, it is interesting that in economically weakest cluster, entrepreneurs enjoy slightly higher social status and media attention, compared to the remaining two regions.

Our exploration of regional aspects of inclusive entrepreneurship resulted into several findings. Female entrepreneurship seems to flourish in economically sound regions, where favorable economic situation drives especially opportunity-based actions. Female are further encouraged by increased self-confidence and opportunity perception. Lower inclusivity of females in less economically sound regions indicates that entrepreneurship is perhaps not the preferred strategy to escape economic necessity among female population. On contrary, youth entrepreneurship, seems to be more encouraged in regions with lower economic power. In such settings, youth may found less attractive and well-paid job opportunities, so opportunity costs of getting involved in risky and less stable own business decrease. Also, lower economic power leads to increased volume of necessity-driven activities. Finally, senior entrepreneurship is also

lower in economically sound regions, as seniors are perhaps less pushed to business out of necessity. It is interesting that economic power hand in hand with increased business opportunities and higher aggregated self-confidence are not sufficient to stimulate seniors to increase their involvement in business. So, it seems that while necessity works for them as a driver of entrepreneurship, opportunity does not.

## **Conclusion**

In our paper, we studied regional differences of inclusive entrepreneurship in Slovakia in relation to macroeconomic and entrepreneurial attitude perspectives. Our findings result into several implications for policy-making on regional levels. In developed regions, policy makers should focus on creation of programs and instruments to compete for entrepreneurial talent with good job opportunities, to exploit the enterprising capacity (especially of youth). Also, while developed regions should capitalize upon women's business appetite, in less developed regions women need to be encouraged and explained how entrepreneurship can help them to improve their economic situation, how to start the business and where to find market (how to serve more developed regions if possible, or even export abroad). For seniors, policy tools should focus to encourage more opportunity-driven activities in developed regions, too. In less developed regions, policy instruments shall be used to improve weaknesses of entrepreneurial activity, to use it for better job creation and regional economic growth.

Our paper is the first exploratory study. However, GEM dataset owns huge potential particularly if individual and regional level of data are combined with macroeconomics figures. This allows further study of regional inclusive entrepreneurship from different views.

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## THE ROLE OF ORGANIZATIONAL CULTURE IN THE PROCESS REORIENTATION OF THE COMPANY

Natalia Potoczek - Anna Ujwary-Gil

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### Abstract

**Purpose:** This paper discusses and investigates the role of the organizational culture in the process reorientation of the organization. Seeing that a special role in the formation of the process culture is attributed to the supplementary processes in the field of Human Resource Management (HRM), this paper focuses on the role of HR-processes that deliver value to all employees in the organization. According to the authors, the designing of HR-processes cannot differ from standards of designing the business processes. The perspective of dynamics of the organizational culture and its importance in process management is regarded as the key aspect of the discussion.

**Design/methodology/approach:** The paper is based on case studies of Polish companies. The study used analysis of company documents and descriptions of internal processes. The paper describes examples of two Polish companies: Poczta Polska S.A. and Azoty S.A.; being organized according to processes, including HR-processes, their activity contributed to the effective restructuring in the first case and to strong expansion and development in the second one. To identify the elements of process culture that shows the development of a process culture, among others, the results of the research done on process culture by von Brocke and Sinnl (2011) were used.

**Findings:** The empirical insights show that the basis for the formation of the process organization culture is the creation of an internal mechanism that provides systemic support of the development of culture promoting the values that bind employees together in the performance of their mutual tasks. The transparent architecture of processes, roles and relationships between processes allow members of the organization to act more efficiently, even if their organization is territorially dispersed. Finally, it can be concluded that the process-oriented culture can support any organized, collective and goal-oriented action.

**Research/practical implications:** The paper includes implications for the development of a strong corporate culture supporting organizational roles and process structure. Process orientation should promote greater flexibility in the organization and quickly adapt changes in the environment and in particular to customer expectations.

**Originality/value:** This paper fulfils an identified need to study how as the process reorientation of the company may be supported by organizational culture.

**Keywords:** Organizational culture, Process orientation, Human Resource Management

**JEL Codes:** M12, M14, O15

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## **Introduction**

The global economic expansion naturally brought new problems to be solved and new management challenges for organizations. The expansion of the organization enforced the introduction of new methods of management use of information technology that will meet new needs for the acquisition, collection and processing of information. One of the most strongly developing trends in the theory and practice of management is the Business Process Management (BPM). Concentration on economic processes has become necessary in organizations that ceased to control and improve them in the course of their own expansion.

Currently, business processes must be regularly supported by supplementary processes. Single initiatives and projects generate high costs, and their results do not consolidate desired changes permanently. Considering the fact that all processes in the enterprise are carried out by employees, the need for proper designing and management of human resource processes according to standards relevant to business processes becomes a natural consequence. Similarly to business processes, human resource processes are usually carried out in a continuous manner; depending on the needs of the organization, they can also be implemented cyclically or occasionally. The definition of a human resource process in an organization managed according to processes cannot differ from definitions adopted for business processes.

The process reorientation of the organization means a transition from a functional organization to a process organization. Evolution means that the organization undergoes intermediate stages. It must be stressed here that the reorientation of each organization is an individualized process. Some organizations undergo process reorientation in a radical way by implementing the ideas of reengineering proposed by Hammer and Champe (1993) within a short time. Other organizations go through many intermediate stages in an evolutionary manner by reorganizing individual areas of the company's operation. Such an approach is currently regarded as the proper way of development of process management.

The process reorientation of the organization is a change that refers to its entire activity; it covers business activity and supplementary activity. As in the case of any other change in a global organization, it is naturally supported or prevented by the organizational culture. Human resource processes play a special role in the formation of the organizational culture supporting process-oriented management. In further chapters of the paper, an analysis of the formation of process culture in the organization and the role that can be played by human resource management within this scope will be presented.

## **1 Material and methods**

The research was carried out from 2013 to 2015 on the relationship between Human Resources Management (HRM) and Business Process Management (BPM) in Polish organizations. The study also dealt with the issue about shaping the organizational culture. The research project was funded by the National Science Centre under the Contract No. UMO-2011/01 / B / HS4 / 02784. It was carried out in nine firms by using a case study method. From the nine firms studied, data from two of the Polish firms were used to explore the cultural issues. Brief descriptions of the two Polish firms, Polish Post S.A. and the Azoty Group S.A., are presented later in this article. To identify the elements of process culture that show the development of a process culture, the results of the research done on process culture by von Brocke and Sinnl (2011) as well as Hatch's (1997) dynamic approach to shaping the organizational culture were used.

To analyze the process culture, two criteria were used to select the firms: (1) the identified and described personnel processes according to the BPM methodology and (2) the lack of connection with foreign capital. Both the methods and the IT tools implemented in the area of HR and used in business processes were considered to be essential prerequisites for identifying the process culture. In addition, the lack of connection with foreign capital provided evidence that the firm independently acquired the knowledge about how to manage the process, rather than implementing a foreign enterprise's standards into their firm.

## **2 Formation of the culture of a process-oriented organization**

After a few decades of research and the promotion of the organizational culture in business, this subject continues to arouse interest. The organizational culture can really support the management process and the achievement of good results in business activity, but it may also frustrate managers' efforts if it is marginalized. The analysis of cultural conditions became a common practice during the implementation of new concepts and methods of management. The role of the organizational culture was eventually recognized also in the BPM area, particularly after numerous attempts to implement reengineering in the 1990s. The first experiences concerning Business Process Reengineering (BPR) showed that the quick and radical introduction of such profound changes in the organization comes up against cultural barriers in the first place. Further concepts of evolutionary reorientation of the organization towards process management referred to cultural influences with due respect.

The significance of the organizational culture in process management can easily be noticed in process maturity models that are based on the holistic approach to the management process and treat the organizational culture as an important development factor (Rosemann & von Brocke, 2010; Hammer, 2007; Fisher, 2004). For example, in the BPM Maturity Model, prepared by Rosemann and de Bruin (2005), culture is one of six factors of business process management (strategic alignment, supervision, methods, information technology (IT), people and culture and leadership). In Hammer's PEMM model (2007), culture is one of four factors (leadership, culture, competence, supervision) determining the organization's capacity to use process management. Fisher (2004) specifies five levels of introduction of changes in process management, which form a lever of process development. They include: the strategy level, the control level, the process level, the people level and the technology level. Organizational culture was assigned to the 'people' level alongside factors such as human resources, work environment, skills or organizational structure.

Culture is a broad concept that can be interpreted in various ways, mainly depending on the context. Definitions, although numerous, have one common denominator: they all refer to methods of people's thinking and behavior. For example, Hofstede (2005) defines culture as a 'collective programming of the mind,' whereas Schein (2004) refers to the significance of primary assumptions and values in the formation of culture in a group. For the purpose of understanding the importance of the organizational culture in BPM, Vom Brocke and Sinnl (2011) made a differentiation between two scopes of research important for the understanding of the essence of culture: 1) the first one, represented by Schein, refers to the manifestation of culture, 2) the second one refers to the scope of the referenced group and is represented by Hofstede, who refers to the national culture, or Leidner and Keyworth (2006) pointing out relationships between the national, organizational and group culture. Vom Brocke and Sinnl reviewed the literature of the subject and identified research on the significance of the organizational culture in BPM, which was carried out also by Pritchard and Armistead (1999), Spanyoli (2003), Jayaganesh and Shanks (2009), Vieira and Neumann (2008). All of these studies focus on the organizational culture as a collective phenomenon in a given social group and on manifestations of culture through various kinds of artifacts that may be perceived as favorable or burdensome for BPM.

Vom Brocke and Sinnl (2011) proposed frameworks that may be used for the structure of future research on culture in process management, including:

- three identified categories: the national culture, the organizational culture and the group work culture may be significant for the examination of the impact of culture on process management,
- in order to achieve goals in process management, it is necessary to adjust the concept of management to the organizational culture,
- invisible values are manifested in visible actions and structures.

The changes in management systems observed during the last few years confirm that the organization strongly concentrates on the construction of a cohesive system of values on which all systemic solutions are to be based. Special challenges are faced by international and multicultural organizations; in their attempts to bring about the unification of values, they may come across barriers relating to the strong national culture.

The human resource management system in a process-oriented organization requires that all of its elements, including strategy, organization model, competence model, remuneration model, personnel process model and levels and directions of improvement, should be designed in a manner that is coherent with the system of values (Potoczek, 2016). Values supporting process management that are quoted most often in literature and practice include customer orientation, improvement, responsibility, co-operation, and self-management. Examples of two Polish companies contained in the further part of the paper confirm the importance of values of the organization and their role in the creation of the process - oriented organization.

### **3 Participation of values in the designing of human resource processes in Poczta Polska**

Poczta Polska S.A. (Polish Post) is a company with a 458-year-long tradition and the biggest operator on the Polish market; it encompasses over 7,200 post offices, branches and agencies. It provides services to private and business customers. In its current form, it is an enterprise owned entirely by the state treasury; since 2009, it has operated as a joint stock company. Liberalization of the market in the last few years has forced Poczta Polska to compete with other service providers (<http://www.polish-post.pl/> 20.03.2017).

Entering the path of profound restructuring, Poczta Polska S.A. introduced five primary values that express employees' attitude to the company, colleagues, work, customers and changes. They were formulated as follows: 1)*We treat our company and each other honestly,* 2)*We focus on finding solutions rather than finding fault,* 3)*We are effective – we act*

*consistently, quickly and simply, 4) We treat customers in the same way that we would like to be treated, 5) We define leadership as responsibility for the effective implementation of changes and the development of employees.*

If adopted values are to go beyond the sphere of declarations, it is necessary to introduce systemic solutions relating to human resource management, which:

- firstly: will disseminate the proper interpretation of recognized values,
- secondly: will help to identify desired behaviors of employees,
- thirdly: will facilitate the rewarding of achievements in designated areas of activity.

Process management in Poczta Polska was recognized as a necessary condition for achieving the effectiveness of the organization, and the process was recognized as a way of achieving the goals of the enterprise. In view of this, the Process Management Office was established as the relevant organizational unit responsible for the co-ordination of works in the field of the formation of process architecture and the process management system. Unified process standards were elaborated for Poczta Polska and published in the Process Management Standard Manual. This document contains a set of all rules of defining and managing processes. These rules refer to the allocation of responsibility for processes and define the hierarchy of processes in the organization and requirements relating to the documentation describing processes and the place of its storage.

Process architecture covers all activities performed in Poczta Polska. The following three primary categories of processes were determined: 1) management processes, 2) primary processes, 3) supporting processes. In the hierarchy of processes, the highest level is occupied by the Supreme Process, then the Main Process, the Operating Process, sub-processes and procedures and tasks that are elements of processes or go beyond identified and ongoing processes. The identification, description and graphic reproduction of processes is performed with the use of ARIS Platform with IT tool used for the mapping and management of processes. Process documentation consists of two documents: the Process Sheet and the Recommendation Transfer Sheet. The place of storage of process documents is the Platform of Knowledge. The Process Management Office is responsible, among others, for the creation of documentation architecture and the assignment of codes to identified processes. On various levels of the hierarchy of processes, there are repeated roles of Process Owner, Process Expert and Process Manager. The role of Process Owner was associated with functions of presidents, directors and heads of departments. Process Experts are employees indicated by the Process Owner. Functions of Process Managers are fulfilled by employees of the Process Management Office dedicated to the support of processes.

In order to explain the standardization of human resource processes in Poczta Polska, it is worth looking at key actions involved in the designing, implementation and management of a process in the organization on the basis of a specific example. For this purpose, the sub-process of recruitment of employees for administrative and management positions was selected as one of over 250 human resource processes and sub-processes.

The first document that currently forms the basis of formation of the recruitment process is the Recruitment Policy of Poczta Polska S.A., which was introduced by way of Resolution of the Management Board. The document contains a series of significant elements for the further designing of the process.

Detailed rules and stages of the recruitment process are stipulated in the appendix to the Recruitment Policy of Poczta Polska S.A. Its 16 paragraphs regulate the rules of conduct and decision-making for all persons responsible for and participating in the process. It was determined who can become a candidate in the recruitment process and what can constitute an obstacle (e.g. close relationship between the superior and the subordinate). Definitions of concepts used frequently in the document (e.g. competences, simplified recruitment, content consultant, etc.) were established in order to ensure the uniform interpretation of conditions, and, consequently, uniform standards in the organization. Other rules of recruitment include the specification of various methods of staffing a vacant position, e.g., by entrusting the fulfillment of duties or delegating an employee to other tasks than those specified in the employment contract. This document contains also significant rules of implementation of successive stages of the recruitment process that were described in detail in the Process Sheet and illustrated by means of a diagram in accordance with the methodology and notation made available in the ARIS program.

#### **4 Formation of employees' attitudes through human resource processes in the Azoty Group**

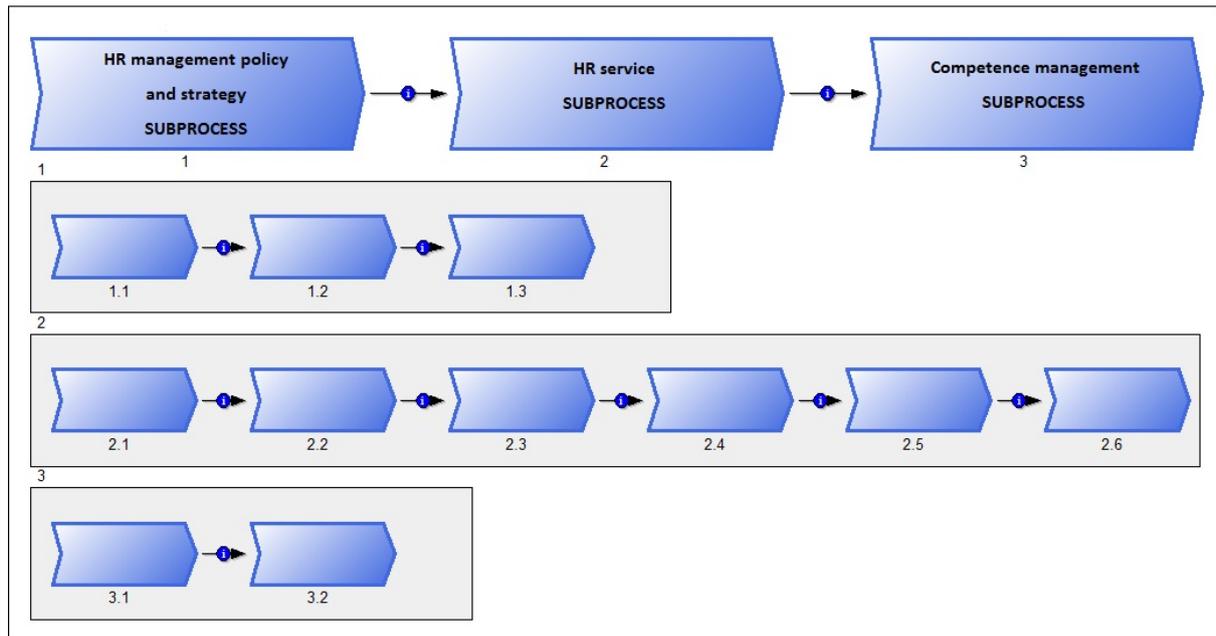
Grupa Azoty (The Azoty Group) is the biggest chemical company in Poland and one of the biggest enterprises in this sector in Europe. The biggest Polish chemical companies operate under the Azoty brand. Group consists of several companies whose interests are jointly represented on the global market (<http://grupaazoty.com/index78f5.html?p=grupa&s=strategia> 20.03.2017). The strong business expansion of the Azoty Group in the last decade was accompanied by significant activities aimed at the improvement of the organization, the increase of efficiency of ongoing processes, the reinforcement of employees through

development and the implementation of incentive remuneration systems. Vertical organization was combined with processes that horizontally integrate operations within companies belonging to the Group. A cross-functional management system was elaborated to combine functional organization with the implementation of economic processes.

Human resource management is one of the main business processes documented and described in the Process Manual of the Azoty Group. The implementation of processes is conducted with the use of relevant guides. The HR process is implemented with the use of 'Management Guide concerning the Main 2<sup>nd</sup> Level Corporate Business Process: XXI. HR MANAGEMENT.' The guide describes the following issues: the supreme goal of the process, terminology in use, main roles in the process, division of decision-making rights for the most important decisions within the process, key decisions indicated for the process leader, process description (main phases of the process, microprocesses and information & decision flows), convergence of the main 2<sup>nd</sup> level corporate process and business processes in companies, internal regulations relating to the process, list of microprocesses assigned to individual processes, subprocesses and their phases.

In the human resource management process, there are three main roles alongside performers – HR specialists and heads and managers of various management levels: 1) Process Leader: President of the Management Board of the Azoty Group, 2) Process Administrator: Head of the Corporate Management and HR Policy Department, 3) Corporate Process Manager: Corporate Process Manager "HR Management".

The documentation of the process specifies types of decisions taken in microprocesses and decision-making rights of entities participating in the HRM process. Types of decisions in HRM subprocesses and their explanations in combination with most frequently assigned entities are listed below. The location of decisions concerning human resources on the highest management level confirms the adopted philosophy of strategic role of this area. The description of the process contained in the documentation encompasses three main phases illustrated on the diagram below (Fig 1). The main phases are actually subprocesses that present sub-subprocesses of successive levels. Each subprocess was appropriately described. The person responsible for the subprocess, main performers, other major participants in the process in the parent Company and main participants in subsidiaries of the Company were specified. The detailed structure of processes along with their inherent functions (microprocesses) and the detailed division of responsibilities within processes are specified in the IT system.

**Fig. 1: Process - HR Management (HRM)**


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Source: Own elaboration based on Potoczek, 2016.

The classification of the HR Management process, its subprocesses, phases and functions has been performed with particular intensity during the last few years; in accordance with intended goals specified in the Strategy of the Group for years 2013-2020, the importance of the description of processes will grow. Quantitative growth and the need for creation of uniform standards in companies of the Group are connected with the reinforcement of process orientation in management.

## 5 Discussion

One of the main research trends in the field of organizational culture is the explanations of changes in culture. When discussing the subject of process management in the organization, it is important to consider the concept of the dynamics of the organizational culture developed by Hatch (1997). Her publication *Organization theory: Modern, Symbolic, and Postmodern Perspectives* (1997) suggests that her development of the dynamic approach was inspired by studies and concepts elaborated by Gagliardi (1986). His theory of relations between culture and strategy explains how culture affects changes in the organization and, *vice versa*, how changes affect the organizational culture. It is worth noticing that research on the dynamics of the organizational culture initiated by Gagliardi and Hatch derives from the concept of the

organizational culture proposed by Schein, where primary assumptions and values determine the essence of the organizational culture.

The model of the dynamics of the organizational culture presented by Hatch explains the processes of creation of artifacts and symbols in the context of values and assumptions of the organization. It also explains how values and assumptions are reinforced and changed as a result of the interpretation of artifacts and symbols. Hatch suggests the interaction between artifacts, values, symbols and assumptions. Any change in one of these elements affects other elements, although this does not have to take place every time. Social changes are very complex and simple single-factor influence never occurs (Hatch, 1997).

In Hatch's model, there are four key elements: Assumptions, Values, Artifacts and Symbols. These elements are connected by processes that occur continuously in the organizational culture; the author refers to them successively as: 'manifestation', 'realization', 'symbolization', 'interpretation'. Manifestation is the process by which assumptions and values create expectations towards the world; these expectations create images and visions that organize actions. In the further 'realization' process they provide the starting point for the materialization of artifacts, which reflect adherence to recognized values by the organization. In the further 'symbolization' process, artifacts transform into symbols. For example, a new conference room created for providing space for co-operation in the organization becomes the symbol of an organization promoting commitment and openness to others. Furthermore, the subsequent 'interpretation' process allows us to define the meaning of symbols; symbols themselves are also used for questioning the existing assumptions. The possibility of changes in the organization eventually arises when assumptions are symbolically questioned in the interpretation process. The reinforcement of assumptions occurs when interpretations reinforce the expectations that already exist, but this is not necessarily the rule (Hatch, 1997).

Referring to the above reasoning, we can make an attempt to explain the importance of cultural change in the implementation of process management. Understanding of the dynamics of the organizational culture by managers performing process reorientation in the organization can be very important. According to the BPM concept, processes cannot be managed until they are properly identified and described. If we create the process architecture of the organization on the basis of recognized values that should guarantee the accomplishment of business goals and if we follow the rules of process designing, we should obtain artifacts (process maps, diagrams, descriptions, metrics, tools used in process management, employees' behaviors, communication in processes, language reflecting the adoption of process terminology, etc.) that will confirm the existence of the process approach in the organization. However, only further

cultural processes, i.e., symbolization and interpretation, will show if change was actually introduced and if it contributes to the pursuit of the organization's goals.

Two cases of Polish organizations presented above provide examples of the use of values and the obtaining of cultural artifacts confirming the adoption of process orientation in management. Both in the first and the second case, the level of presented artifacts testifies to the high level of advancement of process reorientation of the organization. Works on the improvement of implemented processes have been developed for a few years, and new human resource processes are continuously designed and implemented. These actions are directly connected with the performance of strategic goals assumed for the next few years. It is difficult to evaluate at this stage how the processes of symbolization and interpretation of cultural changes will end in the perspective of the model proposed by Hatch. The human resource management infrastructure created for the needs of process reorientation and read in the form of cultural artifacts is aimed at changing employees' attitudes and bringing about their identification with values.

## **Conclusions**

The process culture of the organization is a response to changes in the mentality of contemporary employees. The working environment is very diverse. A process organization can be suitable both for employees who are aware of their creative role and the importance of their intellectual potential and employees who are reluctant to engage and avoid uncertainty. The diversity of process roles creates such opportunities and makes it easier to increase the commitment of dependent and less creative employees by defining the frameworks of employees' activity.

The basis for the formation of the process organization culture is the creation of an internal mechanism that provides systemic support of the development of culture promoting the values that bind employees together in the performance of their mutual tasks. The idea of a process organization leads directly to the concept of an intelligent organization, which is a community of professionals that understand one another well. A process organization also makes it possible to overcome cultural differences in contemporary organizations, which are often a hybrid of various national cultures. The transparent architecture of processes, roles and relationships between processes allow members of the organization to act more and more efficiently, even if their organization is territorially dispersed. Finally, it can be concluded that the process-oriented culture can support any organized, collective and goal-oriented action.

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## EFFECTIVE, BUT INEFFICIENT? PUBLIC SUPPORT GRANTED TO SOCIAL ENTERPRISES FOR EMPLOYMENT

Oto Potluka

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**Abstract:**

**Purpose:** Social entrepreneurship accounts for an important share of employment in the European labour market. Social enterprises, however, are mainly funded by public budgets. In view of this, it is important to evaluate the impact that government-funded social enterprise projects have on individuals' employment opportunities and how effective and efficient such support is from a public finance perspective.

**Design/methodology/approach:** Based on the data of 307 individuals who received EU-funded support in the Czech Republic between January 2009 and June 2015 and a control group of the same size, we estimated the effect that this support had on the employability of the funded individuals. To perform this task, we used a propensity score matching approach.

**Findings:** We conclude that the EU-funding of social entrepreneurship is an effective tool for facilitating employment. The estimated impact that the funding has on these individuals is a 7.8% increase in the likelihood that they will continue to be employed once the funding has ceased. We also confirm positive effects on the employment of the groups threatened by exclusion. Here, women benefited with an estimated 11.6% increase in employment, and people older than 40 years of age with an estimated 14.7% increase in employment. On the other hand, the efficiency of the financial support is not high, since the timespan needed for the payback time is more than 13 years.

**Research/practical implications:** Our study sheds light on effectiveness and efficiency of public support. It helps to target public funding to areas where the effects are the highest.

**Originality/value:** The added value of our research is in its application of unique individual data. Moreover, evaluation culture in social enterprise is developing. Our study adds to the knowledge on how to evaluate impacts of social enterprises in countries with developing social enterprise culture as those in the Central and Eastern Europe.

**Keywords:** Social entrepreneurship, Employment, European Social Fund, Impact evaluation

**JEL Codes:** D04, J21, D61

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## **Introduction**

Current research considers social enterprises as a bridge between the public and private sectors. Some authors (for example Urban, 2015, Karsten, 2005) discuss the paradigm of the social market economy which redefines the public sector's role (Nicholls, 2011) in terms of serving social needs more effectively and efficiently as a result of social innovations.

Our research is set in the Czech Republic, where social enterprise policy is developing and EU-funding assistance amounted to the highest per capita allocation within the EU for the period 2007-13. This assistance aims at Work Integration Social Enterprises (WISE) in the Czech Republic, especially at activities relating to transitional jobs, and socialization through a productive activity.

Our study addresses the political controversy associated with the public funding of social enterprise, and the debate about which sector of the economy should provide the funds for social enterprises to increase employment: the government or the market? It is questionable whether it is justifiable to publicly fund social enterprises when huge public budget deficits exist (Defourny and Nyssens, 2010b). This issue also raises the following research questions: (i) 'Is it effective to invest public funds in social enterprises to increase employment?', (ii) 'How does the public financial support of social enterprises change individuals' employability?', and (iii) 'How efficient is the support from a public finance perspective?' To answer these questions, we estimate the impact that the EU funding of social enterprises has in increasing the employment of people who would otherwise be excluded from the labour market in the Czech Republic.

## **1 Social enterprises as an active labour market policy provider**

### **1.1 Social enterprises and employment**

The present increased interest in social enterprises centres on its labour-market applications. In the 1990s, the main type of social enterprises concerned work integration (Defourny and Nyssens, 2010a). The need to tackle structural unemployment and public budget deficits caused the social economy and existence of social enterprises to spread in Europe (Defourny and Nyssens, 2010b). Social enterprises set themselves the task of alleviating the problems of disadvantaged<sup>34</sup> workers and integrating them within labour market (Defourny and Nyssens, 2010b).

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<sup>34</sup> In the context of our research, disadvantaged workers/people are those who have problems to get employed because of for example health disability, low level of achieved education, lack of skills, etc.

Prior research has confirmed the importance that the public funding of social enterprise has for job creation, especially in cases where the entrepreneur is an experienced manager/leader (Rey-Martí et al., 2016). In the CR, the social enterprises are perceived as organisations employing disadvantaged people with less emphasis on local development and environment in the CR.

## **1.2 Evaluation of the activities of social enterprises**

The growth in the number of social enterprises and the high share of public funding make it necessary to evaluate the social impact that these organisations have in providing appropriate information to stakeholders such as public and private donors, employees, managers, the local community, and target groups (Bengo et al., 2016). The indicators used for measuring performance must suit the main stakeholders' objectives and information needs, and also complement standard accounting measures (Bengo et al., 2016). One method will not fit all evaluation purposes, and evaluations also require skilled evaluators (Harlock, 2013). Moreover, social enterprises must satisfy both economic and social dimensions (Teasdale, 2010). Thus, in order to measure the performance of a social enterprise, it is first necessary to develop several measurement tools.

Public sector evaluations should use cost-benefit analysis and key indices such as the social return on investment (OECD/EC, 2015) or impact evaluations to measure social effects. Rating scales also need to be developed to help social entrepreneurs and private investors to make their decisions. For example, the rating scales used by banks can also be applied, although social entrepreneurs only make use of bank loans to a limited extent (Sunley and Pinch, 2012). Social entrepreneurs need to be aware of both microeconomic and social issues.

As Donaldson et al. (2011) point out, methods for evaluating of the comparative success of social businesses do not extend beyond assessing financial sustainability and outreach, measured as the number of supported beneficiaries. From this perspective, these studies rely more or less on monitoring tools, and cannot be seen as applying an evaluative approach.

## **2 Data and methodology**

Social entrepreneurship is defined within the framework of the ESF Operational Programme Efficient Human Resources and Employment (OP HRE), a programme financed by the ESF and the state budget of the Czech Republic. The support area 3.1 of this programme is assigned to support social integration and social services. The support of social enterprises is aimed at

providing employment, education and psycho-social job-related support to their clients. The investigated calls for proposals had the following goals:

- Integration of disadvantaged people into the labour market.
- Establishment and development of social enterprises.
- Devising a suitable model for social enterprise for the Czech Republic.

Social entrepreneurship was addressed in the OP HRE, and the Integrated Operational Programme (IOP). In total, 121 social enterprises were supported: 78 social enterprises received support from OP HRE, and 18 from IOP; additionally, 25 social enterprises received support from both programmes. The allocation for all surveyed calls amounted to EUR 18,489,371 (MoLSA, 2014).

### **3 Data**

For the purpose of this research, our data was supplied by the Czech Social Security Administration (CSSA). There are legal limits concerning the provision of data on individuals to third parties. For this reason, the queried CSSA data has to first be forwarded to the Ministry of Labour and Social Affairs of the Czech Republic (MoLSA) in an anonymized form before it is released for research purposes. The dataset consists of two groups of individuals. The first one comprises of individuals supported by the OP HRE and the IOP, and the second group is a control group.

After purging our data, the final sample consisted of 307 individuals who were still in the same employment one year after the close of their participation in the support programmes. Moreover, we also obtained separate data for 20,002 individuals to form the control group.

We used the following variables to identify individuals in the CSSA dataset: surname, first name, date of birth, and residence. This information was subsequently erased from the dataset which was provided for the research (see Table 1 for an overview of all the query variables).

**Tab. 5: List of variables**

Variable	Definition	Source
<b>Name</b>	Name of a supported person. The name was erased from the dataset by CSSA after completion of the dataset.	Managers of the implemented projects.
<b>Family name</b>	Family name of a supported person. The name was erased from the dataset by CSSA after completion of the dataset.	Managers of the implemented projects.
<b>Date of birth</b>	Date of birth in the format DD.MM.YYYY. Date of birth was replaced by year of birth by CSSA after completion of the dataset.	Managers of the implemented projects.
<b>Gender</b>	Man / Woman	Managers of the implemented projects. CSSA for control group.
<b>Year of birth</b>	Year of birth	CSSA
<b>Start of support</b>	Start Date of the individual's support project. The date has the format MM.YYYY. The exact date when a person entered a project, if the managers of implemented projects knew that date (eight projects). Otherwise, the project's start date is used.	MONIT7+
<b>End of support</b>	End Date of the individual's support project. The date has the format MM.YYYY. The exact date when a person left a project, if the managers of implemented projects knew that date (eight projects). Otherwise, the project's end date is used.	MONIT7+
<b>Residence</b>	Place of residence of a person in January 2009. This consists of the first three digits of the respective Czech ZIP code. There are seven categories of regions according to the first digit: Prague, Central Bohemia, Southern and Western Bohemia, Northern Bohemia, East Bohemia, Southern Moravia, and Northern Moravia.	Managers of the implemented projects for the respective individuals. CSSA as control group.
<b>Employment(MM/YYYY)</b>	Information whether a person was employed in a particular month MM of a year YYYY. Information is available for the period from January 2009 to June 2015.	CSSA

Source: Own elaboration

## 4 Methodology

The estimation of impact that support has on employability is based on the comparison between a group of supported and a group of non-supported individuals. We used propensity score matching to obtain two statistically similar groups in order to estimate the impact (Rosenbaum and Rubin, 1983).

A logit regression was used to obtain the propensity score. We used the following variables to compute the propensity score for each person: place of residence, gender, year of

birth, and employment in January 2009. In cases where the non-supported group consisted of more than one individual, the match was performed randomly. An approach for nearest neighbour matching without replacement was applied with a caliper threshold of 0.2 (for more details, see, e.g., Khandker et al., 2010). This gave us a final sample of 307 in each group.

Statistical tests proved that both groups are statistically similar regarding the above-mentioned observable variables (we can provide these upon request).

Since the support was not provided simultaneously to all participants, we have to control for the development of economic variables in the months surveyed. We did this by matching individuals. We also checked whether the common support (sufficient overlap in the propensity scores of the matched cases from the two groups) is sufficient to apply propensity score matching, since the propensity score covers the same interval for the compared groups.

## **5 Results and discussion**

### **5.1 Development of employment**

The Czech Republic's long-term unemployment rate fluctuated within a range of 5 – 9% in the period 2009-2015 (MoLSA, 2016). While unemployment for the whole Czech economy is one of the lowest unemployment rates in Europe, the sample of individuals of our research witnessed an unemployment rate of around 65% in 2009.

The implemented projects began to provide actual support to individuals in April 2010. For our sample, we count the period of support as beginning on 1 April 2010 and ending on 30 June 2014. The average aggregate employment rate for individuals in the supported groups at the end of the support does not reach the value of 100%. This is due to the fact that, for many of the individuals, the end of support is assumed to coincide with the end of the project, but the data on employment use actual calendar dates. This, thus, gives rise to a discrepancy which occurs when an individual terminated his or her employment with the social enterprise before the end of a project and did not find another job until the end of the respective project.

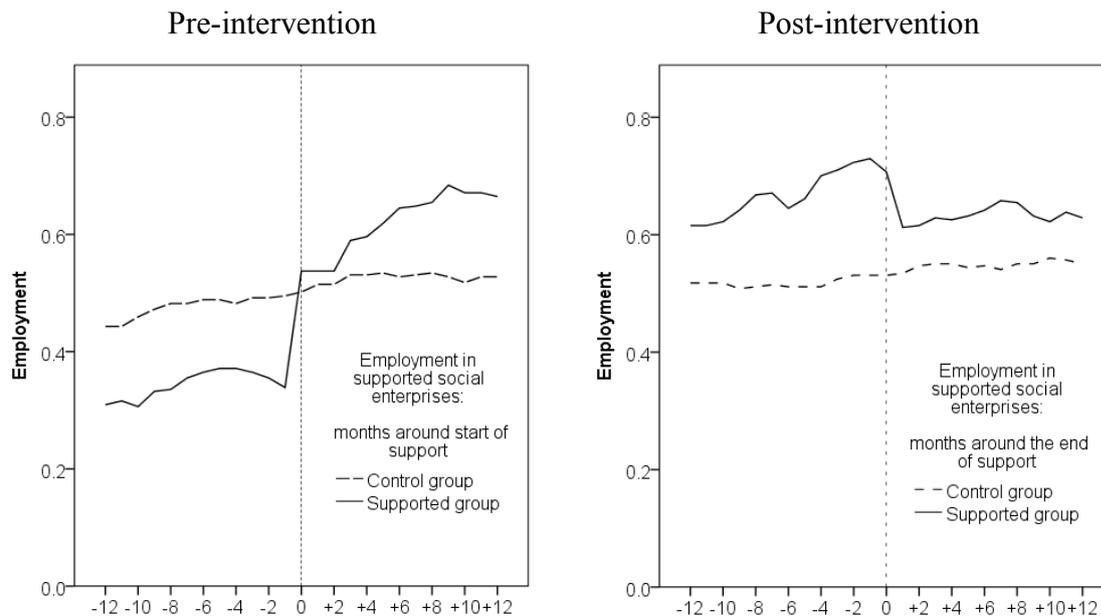
We note here that the employment rate has a positive value (above zero) prior to the commencement of support, because some participants were employed elsewhere at the time of entering a project, and took on the project work to increase their employability.

### **5.2 Results of propensity score matching and discussion**

Figure 1 presents graphs of the change in employment before and after the support intervention for both the supported and the control group. The pre-intervention graph on the left of Figure 1

shows the employment paths for both groups before and during intervention, while the graph on the right shows the employment paths during intervention and after intervention (when no more support was provided by the public budget). The level of the employment rate was more or less stable during the post-intervention year, with some decline in the last quarter.

**Fig. 1: Change in employment before and after the support**



Source: MONIT7+, CSSA, own calculations, N=307 in each group

Our estimates confirm that the EU-funded support of social enterprises has a positive impact on employment. The estimates are +17.6% (p-value = 0.000) higher for the supported group than for the control group for the month when the support ended. The employment estimates slowly decrease over the post-intervention year, with an estimate of +7.8% (p-value = 0.049) one year after the support end date. The estimates demonstrate the sustainability of the jobs created by social enterprise funding in contrast to other types of ESF-funded ALMP interventions, such as company training programmes (Potluka et al., 2016).

Thus far, we have shown that the social enterprise support programme is effective, but we still have to estimate its efficiency. To do so, Table 2 presents the calculation of the payback time from the perspective of the state budget. In column (1), we show the total expenditure on funding the social enterprise programmes in our sample. In column (2), we present the amount of unemployment support that is saved owing to the social enterprise employment programmes based on a study by Čadil et al. (2011). According to this study, 5 months of unemployment support amounted to EUR 1,339 (yearly EUR 3,214) per person in 2009 (our pre-intervention

period). The total amount is calculated by multiplying of the four following values: (i) the yearly cost of EUR 3,214 (YUS); (ii) the unemployment rate of 65.5% in January 2009( $u_{01-2009}$ ); (iii) the sample size of 307 persons receiving support (N); and (iv) the estimate of the impact that funding had on employment at the end of the post-intervention year for the sample; i.e., 7.8% ( $\Delta u_y$ ). Furthermore, in line (3), we proceeded similarly as in line (2), using the size of unpaid taxes and insurance which would be paid by the state otherwise (UTI), which equates to EUR 1,558 for five months (yearly EUR 3,738) (Čadil et al., 2011). Line (4) gives the revenue of the state budget for an employed individual (i.e., the total annualized amount of the tax on personal income and social insurance contributions, respectively 15% and 26% of gross salary). This calculation is similar to the one used in line (2) applying the median gross monthly wage (MGW) of EUR 596 used in the study by Čadil et al. (2011). The lines (3) and (4) represent opportunity costs approach from the perspective of the state budget. The line (7) represents amounts saved due to the direct employment during implementation of projects. It is composed of YUS, UTI, and amount of the tax and social insurance contributions on MGW multiplied by the sum of employment years during projects' implementation. During the projects' implementation, there were 3,777 months of employment (which represents 63.4% employment rate). Adjusted to annual basis, it means 314.75 of employment-years for the whole surveyed sample.

**Tab. 6: Rate of payback time for the EU funding of social entrepreneurship**

Item	N°	Sum (EUR)	Explanation
The total ESF expenditure	(1)	4,241,407.78	
Yearly saved unemployment support	(2)	50,406.92	$YUS \times u_{01-2009} \times N \times \Delta u_y$
Yearly decrease in tax and insurance income	(3)	58,632.63	$UTI \times u_{01-2009} \times N \times \Delta u_y$
Yearly increase in tax and insurance income	(4)	45,986.64	$(0.15+0.26) \times MGW \times u_{01-2009} \times N \times \Delta u_y$
Total yearly balance	(5)	155,026.19	2+3+4 (result in EUR)
Payback time without direct employment in projects (years)	(6)	27.36	1/5 (result is in years)
Total savings during the direct employment in projects	(7)	2,191,073.96	$(YUS + UTI + (0.15 + 0.26) \times MGW) \times 314.75$
Payback time with direct employment in projects (years)	(8)	13.23	$(1-7)/5$ (result is in years)

Source: CSSA, MONIT7+, own calculation

The results show that the return on the invested funds takes a relatively long time between the initial outlay and anticipated return in the case of funded social enterprises. If we apply the estimated costs invested in one unemployed individual as being between EUR 6,096 and EUR 9,064 for the period 2010-15 (Jahoda and Godarová, 2016), the respective times to payback without counting with direct employment are 44.4 and 29.8 years. The second

estimation in this study is very close to our estimation. The results confirm the importance of public funding for social enterprises.

## **Conclusions**

This study's estimates show that the public funding of social enterprises makes sense from a political point of view as it is an effective tool for supporting employment. The estimates show that this type of funding has a positive impact on the probability (7.8% increased likelihood) that an individual participating in a social enterprise programme will obtain a job and become employed. Public funding therefore helps to achieve the political goals of the EU funding policy, as stipulated in the EUROPE 2020 strategy (EC, 2010). Moreover, our research confirmed positive effects on the employment prospects of groups threatened by exclusion from the labour market. The estimated impacts on employment clearly confirm the importance of this form of public support.

On the other hand, from the economic point of view is the support more controversial as the efficiency of the support is not high. It takes more than 13 years to obtain all the investment back in return. Thus, it is evident that the psycho-social effects that social enterprises have on individuals' lives, i.e., the informal, 'soft', 'person-related' effects, are more efficacious than the economic effects. This finding confirms the trade-off between economic and social outcomes and the impracticability of achieving all goals at once (Teasdale, 2010). Such a controversy is typical for public policies, as the decision-making is not purely based on economic criteria, but also on social and political values.

We are aware of the limits of our research. Data on the education status and on the disabilities of the individuals involved in the surveyed support programmes would increase precision of our estimates.

## **Acknowledgement**

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## INNOVATION STRATEGY AND ACCESS TO CAPITAL IN SME AND LARGE COMPANIES – EVIDENCE FROM SURVEY

Katarzyna Prędkiewicz

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### Abstract

**Purpose:** The aim of the papers is to check whether there is a relation between companies's declared attitude towards innovation (innovation strategy) and declared problems with access to capital. The analysis takes into account the size of companies. The author intent also to compare the results with parallel conducted studies, when other (more objective) proxy for innovation was employed.

**Design/methodology/approach:** The research is based on a survey that covers more than 400 companies operating in Poland in 5 industries. The survey is based on self-assessment approach. The companies in the survey had to indicate their attitude towards innovation (neutral, occasional, pro-innovative) and answer to a question whether a lack of capital was a serious problem hampering the company development indicating on the Lickert-scale from 1 to 5. Chi-squared test, Welch's t-test and ordered logit model were employed to test hypotheses.

**Findings:** Generally, SME reported higher difficulties with access to capital than large firms. There is also a difference in innovation strategy – SME indicated mainly “occasional strategy”, whereas large companies “pro-innovative”. It was proved that there is relation between innovation strategy and financial constraints. The firms that are moderate innovators are financially constrained, however for strong innovators with pro-innovative strategy it was not confirmed.

**Research/practical implications:** Research have practical implication. Firstly, SME are still in worse position compared to large enterprises in area of access to different source of capital, however this “funding gap” is not so severe, as could be expected. It means that tools which may help improve access to capital for smaller companies as preferential loans, special grants are still justified. Secondly, moderate innovators are exposed to additional difficulties in raising funds successfully, what also confirms the validity of use dedicated tools as subsidy by authorities, regardless the company size.

**Originality/value:** The studies are based on own survey, interviews with owners, managers, financial managers or R&D managers. Examined companies are in their later stage of development (growth, stability) whereas most of the research focus on access to capital for very young, innovative start-ups companies. The finding shows that also older companies suffer from asymmetry of information, especially the innovative ones.

**Keywords:** Innovation, Funding gap, SME, Innovation strategy, Access to capital

**JEL Codes:** G30, G320, O300

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## **Introduction**

There is evidence in the literature, however mixed, that innovativeness may worsen access to capital for SME compared to large entities. Most of studies confirmed “funding gap” for all SME, however the situation is changing all the time, due to policy efforts to improve access to capital for SME, especially innovative ones. The author wants to verify firstly whether innovative companies have worse access to capital than non-innovative in emerging market as Poland and then check how the size of company impacts access to capital in enterprises with different attitude towards innovation.

### **1 Literature review**

On theoretical level possible credit rationing problems was indicated by Stiglitz and Weiss (1981), Myers and Majluff (1984), whereas on the empirical level first study focusing on financing constraints for capital investment was carried out by Fazzari, Hubbard, Petersen, Blinder, & Poterba (1988). This research has been the impetus for further studies and stream of research has focused on investments in intangible assets, which are feature of innovative firms and potentially company with this type of investment is exposed to higher financial constraints. Part of those research gave evidence that R&D activity may be sensitive to cash-flow changes (Cincera & Ravet, 2010). Further studies are ambiguous and part of them confirm definitively existence of financial constraints, particular with regard to small and innovative companies (Bartoloni, 2011; Brown, Martinsson, & Petersen, 2012; Hall, 2010; Lee, Sameen, & Cowling, 2015; Madrid-Guijarro, García-Pérez-de-Lema, & Van, 2016; Ughetto, 2008), but some do not (Jia Wang, Paul Robson, & Mark Freel, 2015; Mina, Lahr, & Hughes, 2013).

There are two key issues in this study – proxy for financial constraints and proxy for innovation. Part of empirical literature employs the investment in R&D sensitivity to cash-flow changes (Carreira & Silva, 2010). Other possibilities are cash holding, financial ratio related to liquidity and debt (Czarnitzki, Hall, & Hottenrott, 2014; Löf & Nabavi, 2016) and approach based on firms’ self-assessments (Savignac, 2008). Going to the proxy of innovation should be mentioned inter alia patents granted (Battagion & Tajoli, 2000), yearly R&D expenditure or the share of this type of expense in the operating revenue (Del Monte & Papagni, 2003; Ughetto, 2008), but also type of innovation (Madrid-Guijarro et al., 2016) or strategy (Jordan, Lowe, & Taylor, 1998).

Taking into account literature review above H1 hypothesis was formulated:

*H1. Companies declaring “pro-innovative” strategy (strong innovators) and “occasional strategy” (moderate innovators) are financially constrained compared to non-innovative peers (neutral strategy).*

The size of firm is important factor in capital access considering the above cited research so next hypothesis was formulated:

*H2. Small and medium-sized firms report problems with capital access, compared to large peers, especially these declaring innovative attitude.*

## **2 Methodology**

The sample of 409 companies operating in Poland in five industries (Manufacturing, Construction, Trade, Transport and Information) was employed to test above formulated hypotheses. The survey (interviews) were conducted in 2015. Respondents in charge for area of innovation or finance were selected from the upper-management level<sup>35</sup>. The aim of the survey was to collect information on innovative activity from one side, and financing decisions from the other side. Most of the companies are small and medium-sized entities (89%), however also data on large companies was collected. Finally, 162 companies up to 49 employees (40%), 199 with number of employees between 50 and 249 (49%) took part in the survey. Control group are 48 large entities with number of employees greater than 250 (11%). Because the survey assumes to use also financial data, the respondents were randomly selected from financial database but the structure of companies were controlled based on size of company and industry.

In presented research two questions from the survey were analyzed. The first of them refers to the declared attitude towards innovations. Companies could indicate one of three strategies: neutral, occasional and pro-innovative. The first choice, neutral strategy, means that the company is not inclined to launch innovation at all. The second possibility, occasional strategy, was chosen by companies in case when innovations are not priority for them, and they do not run continuous action to bring innovation to the market. Innovation in this strategy are rather introduced “by the way” of the various projects, or they are a necessity. Finally, the last strategy, called “pro-innovative” was indicated by the companies which are constantly doing research and innovation is a priority for them and play important role in the company's strategy.

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<sup>35</sup> The presented research are broader study on financing innovation in SME. The same sample also to prove others hypothesis based on other part of sample which are presented in forthcoming articles.

The structure of the sample takes into account the size of a company an innovation strategy exposes that the “innovation on occasion” strategy dominates in SME, whereas half of the large entities declared “pro-innovative” strategy. (Table 1). The choice of innovation strategy differs statistically between SME and large companies (p-value - 0,82%).

**Tab. 1: Structure of sample - strategy – SME VS large**

	Innovation - neutral	Occasional innovation	Pro-innovative	Total
SME	78 (22%)	181 (50%)	102 (28%)	361 (100%)
Large companies	6 (13%)	18 (38%)	24 (50%)	48 (100%)
Total	84	199	126	

Source: own elaboration.

The second analyzed question is the direct (subjective) proxy for financial constraints - the problems with capital access. Respondents were asked “To what extent access to capital (funding) is an important factor hindering the development of the company?”. The answers were ranged with five ordinal response categories (Likert-scale): 1 - it is no problem, 2 - slight problem, 3 - moderate problem, 4 - significant problem, 5 - very serious problem. The structure of the answers for whole sample and separately for SME and large companies is presented in Table 2.

**Tab. 2: Access to capital as a problem in the sample**

Scale	Number	Answers structure - All	Answers structure SME	Answers structure Large
<b>1 - it is no problem</b>	81	19,8%	19%	25%
<b>2 - slight problem</b>	143	35,0%	34%	40%
<b>3 - moderate problem</b>	136	33,3%	34%	29%
<b>4 - significant problem</b>	48	11,7%	13%	6%
<b>5 - very serious problem.</b>	1	0,2%	0,28%	0%
<b>Total</b>	409	100%	100%	100%

Source: own elaboration.

The structure of answers was analyzed with chi-squared and t-Welch's test which allowed to check whether differences in answers between groups of companies that have different innovation strategy are statistically significant. Similar method was used to check whether there is a difference between large and SME in this area. Also ordered logit model was employed to verify hypotheses.

### 3 Results

Welch's t-test (adaptation of Student's t-test) was employed in the first step – a two-sample location test to check the hypothesis that two populations have equal means. Average difficulty in accessing capital for each sub-group isolated based on strategy was calculated, assigning values of 1 to 5 for each answer in the Likert scale and then average value were compared using Welch's t-test (Table 3). The results show that there is no statistical difference between mean of answers in groups of companies with different innovation strategy, whereas there is statistically important difference between SME and large entities. However lack of difference in average value of answers does not mean the lack of difference in distribution of answers. Then, in the next step was to compare the structure of answers for three options of innovation strategy.

**Tab. 3: Welch's t-Test.**

Strategy	X1	X2	SD1	SD2	n1	n2	DoF	T emp	p-value
<b>Neutral (X1) vs Pro-innovative (X2)</b>	2,27	2,32	1,32	0,82	84	126	126	0,27	78,71%
<b>Neutral (X1) vs occasional (X2)</b>	2,27	2,46	1,32	0,72	84	199	105	1,20	23,19%
<b>Proinnovative vs occasional</b>	2,32	2,46	0,82	0,72	126	199	241	1,57	11,80%
<b>SME vs LARGE</b>	2,40	2,17	0,89	0,76	361	48	65	1,99	5,14%

Note: X – mean, SD – standard deviation, n – number of observations, DoF – degrees of freedom; T emp – empirical t

Source: own elaboration.

The first look at the distribution of answers gives the reason to suppose that there is a significant difference between companied declaring different attitude towards innovation (Table 4). Only 16% companies that declared pro-innovative strategy and 15% with occasional strategy have no problems with access to capital, whereas in group of companies with neutral

strategy (non-innovative) it was 37%. However surprisingly most of pro-innovative firms (50%) indicates that finding capital it is slight problem (2). It could be link with sample structure – the “pro-innovative” attitude was often chosen by large entities, which mainly indicated that access to capital is slight problem for them. The group of companies that declared “occasional” strategy seems to be more constrained than “pro-innovative” firms.

**Tab. 4: Innovation strategy and access to capital – sample structure**

Strategy	1	2	3	4	5	Total
NEUTRAL	37%	18%	26%	19%	0%	84
OCCASIONAL	15%	33%	44%	9%	0%	199
PRO-INNOVATIVE	16%	50%	21%	12%	1%	126

Note: Likert-scale: 1 – “No problem” to 5 – “Very serious problem”.

Source: own elaboration.

The differences between answers for each strategy (neutral vs occasional vs pro-innovative and each pair of strategy) were statistically significant what means that the company’s innovation strategy may have an impact on the subjective assessments of problems with access to capital<sup>36</sup>.

However according to literature review, the size of company may have an important impact on the problems with capital finding, then the answers were also analyzed separately for each innovation strategy in group of SME and large entities. The results of chi-square test confirmed that answers inside the companies with neutral and occasional and pro-innovative strategy did not differ between SME and large companies.

Finally, the ordered logit model was built (Table 5). The control variables were chosen based on literature review and results of previous studies (Prędkiewicz & Prędkiewicz, 2015). The following variables were employed: age of company (AGE), debt to capital ratio (DEBT2), operational margin (EBITDAmargin), industry and company size.

Based on analysis of model 1 and 2 it could be concluded that companies which declared occasional strategy are financial constrained (coefficient is positive and statistically important), whereas companies with “pro-innovative” strategy are not constrained (coefficient is negative and also statistically important).

<sup>36</sup> Results of chi-square test are not presented in the paper due to page limitations, but are available upon author request.

**Tab. 5: Ordered logit models**

	Model 1	Model 1	Model 2	Model 2
	coefficient	p-value	coefficient	p-value
AGE	0.0124785	0.01286**	0.0124785	0.01286**
DEBT2	0.736047	0.23195	0.736047	0.23195
EBITDAMargin	0.0121109	0.14124	0.0121109	0.14123
STRATEGY_NEUTRAL	0.016798	0.95474	-0.386176	0.14882
STRATEGY_OCCASIONAL	0.402975	0.05589*	-	
STRATEGY_PROINNOV	-	-	-0.402974	0.05589*
Industry, size	Included		Included	
cut1	-0.499004	0.38501	-0.901978	0.12006
cut2	1.16393	0.04345**	0.760953	0.18811
cut3	2.99187	<0.00001***	2.5889	0.00001***
cut4	7.02175	<0.00001***	6.61877	<0.00001***
Number of cases 'correctly predicted'	= 156 (38.7%)		156 (38.7%)	
Likelihood ratio test	Chi-square(12) = 119.9 [0.0000]		Chi-square(12) = 119.9 [0.0000]	

Dependent variable: ACCESStoCAPITALasPROBLEM (from 1 to 5). Control variable: AGE of company; DEBT2 – Debt/(Shareholder's Equity + Debt); EBITDAMargin - to earnings before interest, tax, depreciation and amortization (EBITDA) divided by total revenue;

Standard errors based on Hessian

Source: own elaboration.

## Conclusion

To sum up results, there are a few main conclusions. Firstly the innovation strategy impact distribution of answers and there is a significant difference in approach to strategy between SME and large companies. SME indicated mainly “occasional strategy”, whereas large companies “pro-innovative”. Secondly, there is statistically significant difference in distribution of answers to a question how the access to capital hamper development of companies between different attitudes towards innovation (however there is no difference in mean between strategies). Thirdly, based on Welch t-test, SME are more financially constrained than large entities, however the difference between SME and large firms in distribution of answers to a question on financial constraints for each innovation strategy has not been confirmed. Fourthly, based on logit model, the group of companies with declared “occasional” strategy is financially constrained, whereas the group with “pro-innovative” strategy is

unconstrained, what is opposite to formulated hypothesis, when it was expected that group of “pro-innovative” firms declares that access to capital hampers their development. This results also are not fully in line with parallel conducted studies, when objective proxy for innovation activity was used<sup>37</sup>. The companies with R&D department were considered to be innovative, and using the same research methods it was found that R&D firms are financial constrained, however similarly there were no difference between SME and large firms. In presented studies only moderate innovators are financially constrained. Much of the surveyed enterprises belonging to SME declared „occasional strategy“, and in this group may be in fact companies with neutral and also pro-innovative strategy. The choice of answers was determined by understanding of innovativeness by a respondent. However when an objective proxy for innovation (R&D department) was used the results were fully in line with expectations that innovative firms are more financially constrained.

There is a broad discussion in the literature which indicator is the best proxy for innovativeness of companies. However in author opinion the best choice is to use wide data on innovation activity of companies (patent, declared strategy, R&D department, R&D expenditure etc.) and create the „innovation indicator“.

Also the way of measuring financial constraint was „direct“, what has the same disadvantages – subjectivity. In the next stage of research also other, objective measure of financial constraints (eg. calculated theoretical demand for funds based on financial data and success rate of finding capital) or are planned to be employed. The results based on self-assessment approach in the further steps of research are going to be compared with other, more objectives measure – what can also give additional information – if the self-evaluation approach to assessing of financial constraints is in line with them.

Research have also practical implication. Firstly, SME are still in worse position compared to large enterprises in area of access to different source of capital, however this “funding gap” is not so severe, as could be expected. It means that tools which may help improve access to capital for smaller companies as preferential loans, special grants are still justified. Secondly, innovative companies are exposed to additional difficulties in raising funds successfully, what also confirms the validity of use dedicated tools as subsidy by authorities.

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## TRENDS AND PROBLEMS OF INVESTMENT IN INTELLECTUAL CAPITAL IN RUSSIAN ECONOMY

Irina Prosvirina – Aleksey Ivanov – Galina Ostapenko

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### Abstract

**Purpose:** In this article, we reveal trends reflecting the direction of investment in Russian economy after crisis in 2008. The aim of the article is to identify investment features that are associated with investment in intellectual capital, technology and innovations.

**Design/methodology/approach:** Theoretical basis of the article is the concept of intellectual capital as well as the global tendency to increase investment in intellectual capital which was confirmed by previous researches. Hypothesis of the study is that in Russian economy this tendency has very particular features, namely: investments in intellectual capital grow at a smaller pace than investments in fixed assets. To prove this hypothesis, we have analysed a large amount of statistical data on the structure and dynamics of investments in 2008–2014 on different levels: Russian economy, regions, industries and companies. We have used comparative, structural and dynamic analysis methods.

**Findings:** We have found the contradiction between investments growth rate in fixed assets and in intellectual capital in Russian economy. We have also shown that this imbalance continues to grow. In our opinion, the reason of such macroeconomic disproportion is the realization of the corresponding investment policy at company level. A number of institutional features of the Russian economy lead to this situation.

**Research/practical implications:** Identifying the features of investments in intellectual capital and explanation of their reasons allow to suggest the practical solutions of this problem of Russian economy development. Our research also allows formulating a number of questions that needs further investigation.

**Originality/value:** In this article, we have discovered one of the main features of Russian companies' investment policy: investments in intellectual capital grow at a smaller pace than investments in fixed assets. This explains the cause of many economy development problems in Russia, first of all, the low production efficiency and the weak integration of innovations.

**Keywords:** structure and dynamics of investments, intellectual capital, investment in intellectual capital, innovations

**JEL Codes:** E22, O34

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## Introduction

The notion of intellectual capital has been introduced into the academic vocabulary by Griliches (1990). This concept reflects modern views of the economists about a system of all intangible drivers that create value for companies. In its turn, the concept is based on the classical theory of basic knowledge by Prahalad and Hamel (1990) and on the identification of tacit and explicit knowledge by Polanyi (1958). Sanchez et al. (2000) provides a collection of historical names that preceded the emergence of intellectual capital as a notion: invisible assets, core competence, strategic assets, core capabilities, intangible resources, organizational memory, etc. In this regard, T. Stewart (1997) gives the following definition: «intellectual capital is the accumulated useful knowledge».

Further numerous studies were focused on the search for opportunities to apply the intellectual capital concept in management. One of the crucial achievements here was distinguishing and systematizing various components within the intellectual capital. For instance, the Organization for Economic Cooperation and Development (OECD) describes «intellectual capital as the economic value of two categories of intangible assets of a company: organizational («structural») capital; and human capital». This particular classification became common (*Petty and Guthrie 2000*).

The strongest contribution to the further structuring of intellectual capital in the 1990-s and early 2000-s was made by L. Edvinsson (2000), as their approaches were based on the practice of managing intellectual capital in large companies. In the organizational capital, L. Edvinsson distinguished a cliental component and an organizational component, and divided the latter into an innovation and process ones. Subsequent attempts to supplement these components with others (such as distinguishing a partnership type of relationship capital or its other types (Leliaert et al. 2003) failed to become common.

At the next stage of the studies, economists were developing models to help estimate the value of intellectual capital: the intellectual capital value cannot be measured independently using cost estimates and reflected in the financial reports (Caddy 2000, Joia 2000). The lack of reliable metrics helping to measure ROI in intellectual capital may be the reason that slows down investing in intellectual capital growth of non-public companies when the market cannot determine business value based on the stock prices of its shares. The thing is that meeting accounting standards results in a contradiction: the more a company invests in its future – that is, in intellectual capital, the lesser is its book value (Malhotra 2000). Since the vast majority of companies in Russia are non-public, it is difficult to measure ROI in intellectual capital.

Business owners prefer to invest in fixed assets that are reflected in the balance sheets and lead to the growth of the assets book value.

No studies to either support or deny this trend have been pursued in Russia. Therefore, we hypothesized as follows: the lower performance of the Russian economy is largely explained by the fact that companies do not invest in intellectual capital as much as it would be sufficient for the smart use of renewable fixed assets. This situation will manifest itself as a statistically observable imbalance between the growth rate of investments in fixed and intellectual capital.

## **1 Data and methodology**

### **1.1 Data**

To prove this hypothesis, macroeconomic, regional and business statistical data were used. The choice of indicators is based on the conventional approach to the intellectual capital structure and the availability of relevant indicators in the government statistics system. In order to compare investments in fixed and intellectual capital at the macroeconomic and regional levels over time, absolute indicators are taken as relative: the scope of investments in fixed capital is characterized by indicator «Gross Fixed Capital Formation, % to GDP»; investments in intellectual capital by some indicators (see tab. 1). We were unable to find an indicator that would properly reflect development of the human capital at company level. Indicators that describe the education level in the economy are not suitable, as they are not related to internal investments of companies in staff training.

The statistical data characterizing individual companies were obtained from FIRA database ([www.fira.ru](http://www.fira.ru)) relying on the financial reports of businesses. To characterize investments in fixed and intellectual capital over time, indicators «Investments in fixed assets, % to the revenue» and «Investments in intangible assets, % to the revenue» by industries, activity types and companies were available. In addition, we received indirect estimates of investment volumes in intellectual capital from the overall revenue from such operations that reflect external expenditures of businesses for the purpose of intellectual capital growth, namely consulting (structural capital), extended education (human capital), marketing and advertising (customer capital).

### **1.2 Methodology of the research and econometric analysis**

The research consists of three stages. The first stage was a comparative and dynamic analysis of macroeconomic statistical data that characterized investments in fixed and intellectual capital

in the overall Russian economy. The data on indicators over time are set forth in Table 1 below. For the purposes of an unbiased analysis and an evaluation of detected changes, a comparison was made between them and the relevant indicators for one of the European countries with typical indexes of the innovative activities development. The Czech Republic was chosen as such a country. According to Eurostat, in 2010, the Czech Republic ranked in the middle among EU countries in terms of its share of R&D expenditures in GDP (1.7%). The highest indexes (above 3%) were demonstrated by Finland (3.8%), Sweden (3.4%) and Denmark (3.1%) and the lowest (below 0.5%) by Cyprus, Latvia and Romania. Data from CZSO Public database was used.

The second stage embraced statistical measurement of the extent to which factors that characterize accumulation of the fixed capital and development of intellectual capital of enterprises affect GRP, by regions of the Russian Federation. The regional statistical data was used. The objective of this stage was to support our hypothesis with regard to the supposition about higher efficiency of the economy with more intense investments in intellectual assets. For this purpose, the outcome indicator was chosen as GDP of the regions per economically active inhabitant. The following indicators were chosen as characterizing the GDP growth factors (Table 1).

**Tab. 1: The system of factor indicators determining the level of regions development**

Factor	Indicator to measure the factor	Cond. Symbol
<b>Fixed Capital</b>	Gross Fixed Capital Formation, % to GDP	fix_cap
<b>Intellectual Capital, including:</b>		
<b>Innovative capital</b>	R&D investment expenditure, % to GDP	r&d_exp
	Spending on the organizations' technological innovations per 1 ruble of GRP	tinn_exp
	Share of products of the high-tech sector, % in GRP	high_tec
	Share of organizations that effected technological innovations, %	tinn_comp
<b>Organizational capital</b>	Share of organizations that effected organizational innovations, %	orgin_comp
<b>Customer capital</b>	Ratio of organizations that effected marketing innovations, %	minn_comp

The data on 70 Russian regions for 2014 contained in the public regional statistical database of the Russian Federal State Statistics Service was used for the calculations after anomalous values and data impossible to compare over time had been excluded.

To eliminate multicollinearity, the variables `orgin_comp` and `tinn_comp` were sequentially excluded (Table 2). The model demonstrated statistically reasonable parameters with the retained variable `orgin_comp` and after the introduction of a dummy variable `ind_reg` (x8) that reflected the region's economic activity type. Industrial and other regions (focused on export and farming) were distinguished; for this purpose, there was employed the classification of regions suggested by Rating Agency RIA Rating (2012).

**Tab. 2: Coefficients of correlation (Pearson) between indicators of economic and innovation development of the Russian regions**

	Y (GDP)	fix_cap (x1)	r&d_exp (x2)	tinn_exp (x3)	high_tec (x4)	tinn_comp (x5)	orgin_comp (x6)	minn_comp (x7)
Y (GDP)	1							
fix_cap	0.113	1.000						
r&d_exp	0.205	-0.045	1.000					
tinn_exp	0.389*	-0.120	0.454*	1.000				
high_tec	-0.237	-0.297*	0.484*	0.226	1.000			
tinn_comp	0.341*	-0.033	0.252	0.468*	0.085	1.000		
orgin_comp	0.390*	-0.103	0.423*	0.486*	0.151	<b>0.708**</b>	1.000	
minn_comp	0.232	-0.020	0.267	0.377*	0.076	0.663*	<b>0.779**</b>	1

\*\* – close linear correlation between the indicators

\* – moderate linear correlation between the indicators

The linear correlation between other indicators is low or absent

Source: calculated by the authors on the basis of Russian Federal State Statistics Service

The models of multiple regression were calculated in GRETL package (<http://gretl.sourceforge.net/ru.html>) according to Wooldridge (2002). To choose between the models, their comparison by  $R^2$  was made: in a linear model,  $R^2=0.501811$  while in an exponential one,  $quasi-R^2=0.5216$  (calculated separately for Y values in physical terms in order to compare them with the linear model with the same number of variables). Therefore, an exponential model better explains GRP changes with overall chosen factors. Parameters of the exponential model are set forth in Fig. 1. By analyzing the standard errors of coefficients and the value of Student's t-ratio, we conclude that all coefficients of the model are significant. Variable `fix_cap` has the lowest level of Student's t-ratio (Fig. 1), yet the checking of the critical value of t-ratio from Student table showed that  $t_{crit.} (10\%, 69-5-1=63)=1.67$  was lower than  $t_{calc.} (1.712)$ . Therefore, the coefficient with variable `fix_cap` was significant with 0.9 probability, while the actual variable influences Y and was kept in the model. Other variables are significant with higher probability rates of 0.95 (`tinn_exp` and `orgin_comp`) and 0.99 (`high_tec`).

**Figure 1: Statistical parameters of the model that describes the influence of indicators of fixed and intellectual capital on the GRP growth**

Model 8: OLS, using observations 2-71 (n = 70)				
Dependent variable: l_y				
Heteroskedasticity-robust standard errors, variant HC1				
	coefficient	std. error	t-ratio	p-value
const	6.28347	0.130974	47.98	6.83e-052 ***
x1	0.00445863	0.00260440	1.712	0.0917 *
x3	3.87066	1.68581	2.296	0.0250 **
x4	-0.0166229	0.00334186	-4.974	5.21e-06 ***
x6	0.0440961	0.0193014	2.285	0.0257 **
x8	0.245514	0.0550607	4.459	3.40e-05 ***
Mean dependent var	6.377992	S.D. dependent var	0.262497	
Sum squared resid	2.284040	S.E. of regression	0.188913	
R-squared	0.519598	Adjusted R-squared	0.482067	
F(5, 64)	21.79540	P-value(F)	1.13e-12	

The model is represented by the following regression equation (standard errors are marked below the coefficients).

$$\ln(Y) = 6.28347 + 0.00445863 * \text{fix}_{\text{cap}} + 3.87066 * \text{tinn\_exp} - 0.0166229 * \text{high\_tec} + 0.0440961 * \text{orgin\_comp} + 0.245514 * \text{ind\_reg}$$

*(0.131)*
*(0.0026)*
*(1.6858)*  
*(0.0033)*
*(0.0193)*
*(0.0551)*

At the third stage of the research, a comparison was made between the growth dynamics of investments in fixed capital and intangible assets, and the dynamics of revenue in consulting, extended education and marketing, according to the statistics of enterprises. The official statistics has no data on internal expenditures of businesses in these areas.

## 2 Research outcomes

The first-stage calculation outcomes are set forth in Table 3 (Russia) and Table 4 (Czech Republic). The analysis of the data presented in Table 1 shows that the gross accumulation of fixed capital in Russia has pronounced growth dynamics (17.4 % in 2005 against 19.7 % in 2014), as demonstrated in Fig. 1. At the same time, the decline of most indicators that reflect intellectual capital development is observed. For instance, R&D investment expenditure (in % to GDP) decreased from 1.137 to 1.099 % over that period. Therefore, investments in fixed capital are accompanied by organizational improvements and growth of intellectual capital just slightly or not at all.

**Table 3: Dynamics of indicators that characterize investments in fixed and intellectual capital in the Russian economy in 2005-2014**

Indicator	2005	2010	2011	2012	2013	2014
<b>GDP, bn RUB</b>	21,609.8	46,308.5	55,967.2	62,176.5	66,190.1	71,406.4
<b>Gross Fixed Capital Formation, % to GDP</b>	17.4	20.6	20.3	20.8	20.8	19.7
<b>including purchase of new fixed assets, % to GDP</b>	3.14	2.87	3.41	3.43	3.58	3.40
<b>R&amp;D investment expenditure, % to GDP</b>	1.137	1.149	1.070	1.112	1.108	1.099
<b>Share of innovative organizations*, %</b>	9.5	10.4	10.3	10.1	9.9	9.3
<b>in terms of: technological innovations</b>	7.9	8.9	9.1	8.9	8.8	8.3
<b>organizational innovations</b>	3.2	3.3	3.0	2.9	2.8	2.7
<b>marketing innovations</b>	2.2	2.3	1.9	1.9	1.7	1.8
<b>Number of valid patents, pieces per RUB1 bn of GDP</b>	7.59	5.61	4.23	4.10	4.12	4.10
<b>Share of spending on technological innovations in total sold products, %</b>	1.5	1.5	1.8	2.2	2.1	1.8

\*over the reporting year, in the total number of the studied organizations

**Table 4: Dynamics of indicators that characterize the GDP growth factors in the Czech Republic in 2008-2015**

Indicator	2008	2009	2010	2011	2012	2013	2014	2015
<b>Gross Domestic Product, CZK bln</b>	4,015.3	3,921.8	3,953.7	4,033.1	4,059.9	4,098.1	4,313.8	4,554.6
<b>Gross Fixed Capital Formation, % GDP</b>	29.022	27.117	26.963	26.281	25.910	25.062	25.130	26.305
<b>High-tech sector, % κ GDP</b>	1.061	0.953	0.952	0.891	0.986	1.014	1.199	0.971
<b>Total R&amp;D expenditure, % to GDP</b>	1.242	1.297	1.340	1.556	1.782	1.900	1.973	1.947
<b>R&amp;D investment expenditure, % to GDP</b>	0.148	0.142	0.169	0.290	0.415	0.416	0.418	0.401

Source: CZSO Public database

The similar indicators for the Czech Republic are different over time. The Table 4 shows that, from 2008 to 2015, the role of gross accumulation of capital in GDP production declined gradually and consistently from 0.290 to 0.263 (calculated per 1 CZK of GDP). It means that it takes fewer investments in fixed capital to produce GDP. At the same time, the role of other GDP growth factors increases as well; for instance, R&D expenditures (in % to GDP) increased from 1.242 to 1.947 over this period. The greatest growth, however, is demonstrated by R&D investment expenditures (from 0.148 to 0.401, or almost threefold). A bottom line here is that investments in research and development enable companies to increase fixed capital efficiency. This trend reflects the aim of corporations to reduce the scope of fixed capital engaged in business and to boost ROI.

The built econometric model (the second stage of the research) showed that, with other factors unchanged, growing investments (calculated per 1 ruble of GRP) per 1 unit would cause an increase of the gross regional product by 0.447 % (calculated as  $\text{EXP}(0.00445863 \cdot 1) - 1) \cdot 100$ ) on average. Other factors have a greater impact on the GRP value. For instance, if spending on technological innovations of businesses is increased by 0.01, GRP (per one economically active inhabitant) will grow by nearly 4 % ( $\text{EXP}(3.87066 \cdot 0.01) - 1) \cdot 100$ ); and if the share of organizations that roll out organizational innovations increases by 1, GRP will grow by 4.508 % on average. For industrial regions, the average GRP value is greater by 27.828 %.

This way, we obtain statistical confirmation of a very minor impact of investments in fixed capital on the economic growth without investments in intellectual capital. The greatest impact on the GRP growth (per one economically active inhabitant) is made by growing spending on technological innovations (*tinov\_exp*) and companies introducing organizational innovations (*orgin\_comp*). Therefore, innovative and structure capital plays the most important role in the structure of the GRP growth factors. The identified investment trends in the Russian economy explain a dropped ROA (from 7% in 2010 to 4% in 2014) and reduced share of profitable organizations from 70.4 % in 2010 to 68.1 % in 2015.

The third stage of the research consists of data measurements on the growth of investments in fixed and intellectual capital over time by a number of machine-building enterprises in Chelyabinsk Region (one of the most industrial leaders in Russia) based on the statistics from businesses (Table 5). From 2006 to 2014, the scope of investments in fixed assets in relation to the revenue increased from 2% to 8.3%. At the same time, investments in intangible assets in absolute figures are declining from 2,227 to 976 thousand rubles (in 2013) and are close to a statistical error (0.001 %) in relative terms. The 2014 data is not stated due to their statistically insignificant value.

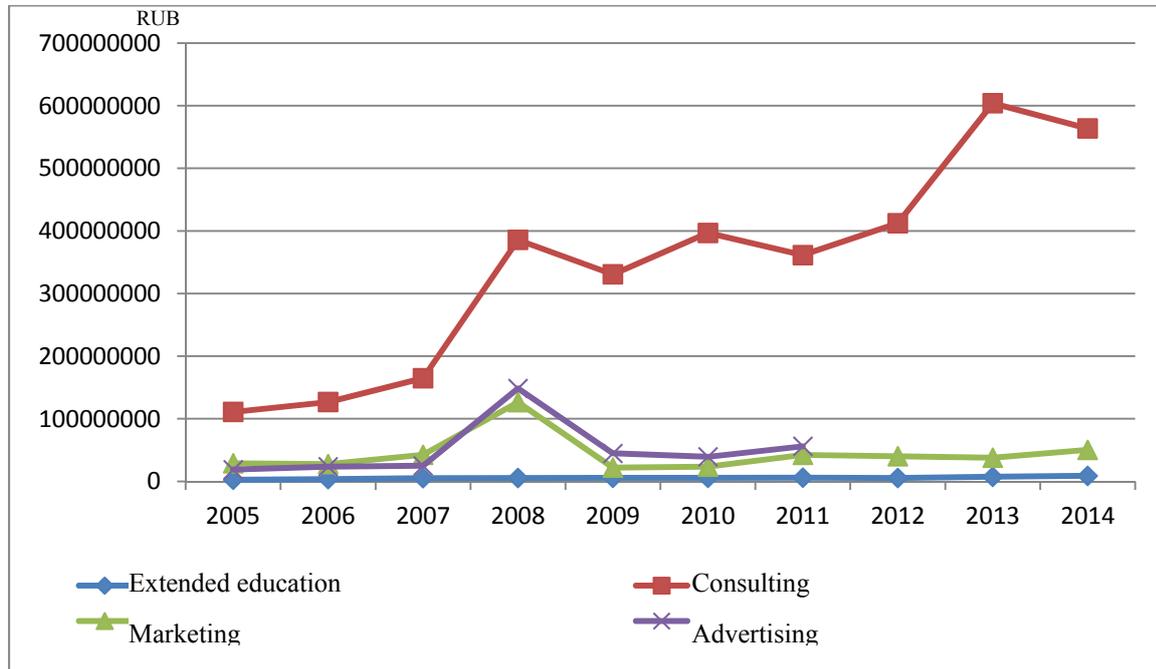
**Table 5: Dynamics of investments in fixed assets and intangible assets (Chelyabinsk Region, machine-building industry)**

Indicators by sector	2005	2010	2011	2012	2013	2014
<b>Total revenue, bn RUB</b>	18,667.5	37,274.4	51,978.7	51,121.7	52,335.5	50,890.9
<b>Investments in fixed assets, bn RUB</b>	367.4	738.2	1,156.7	2,998.7	3,118.3	4,237.1
<b>In % to the revenue</b>	2.0	2	2.2	5.9	5.9	8.3
<b>Investments in intangible assets, thousand rubles</b>	2,227	669	739	942	976	-
<b>In % to the revenue</b>	0.012	0.002	0.001	0.002	0.002	-

Source: [http://chelstat.gks.ru/wps/wcm/connect/rosstat\\_ts/chelstat/resources/c4b0f0048c0f03aa00ef0f7eaa5adf2/Invest-okved.pdf](http://chelstat.gks.ru/wps/wcm/connect/rosstat_ts/chelstat/resources/c4b0f0048c0f03aa00ef0f7eaa5adf2/Invest-okved.pdf)

The Fig. 2 shows data on the changes in the revenue of companies offering extended education, consulting, marketing research and advertising across the Russian Federation in 2005-2014. The provision of these services boosts intellectual capital of customer companies. Consulting is the only area that demonstrates sustainable growth (in absolute terms). In our opinion, it can be interpreted as a growing demand of businesses for managerial insights, which can be an indirect confirmation of growing investments in the organizational capital. Still, the research identified no impact of such components of intellectual capital as human and customer capital on economy efficiency. This is due to the lack of reliable metrics in the statistical data system.

**Figure 2: Changes in the revenue of businesses providing extended education, consulting, marketing and advertising services across the Russian Federation in 2005-2014**



## Conclusion

The research hypothesis is confirmed by macroeconomic, regional and corporate statistics. Having compared the investments in fixed assets and intangible assets of Russian companies over time, we made a negative conclusion: growing investments in fixed assets in the Russian economy occurs amidst the declining corporate investments in all components of intellectual capital. The comparison of the trend with some European countries leads to the conclusion that the efficient use of fixed assets requires an increase of internal expenditures on R&D and innovations. According to the results of the econometric analysis, the greatest impact on the efficiency of regional economies of Russia is made by two factors – the growth of internal expenditures of companies on technological innovations and the introduction of organizational innovations that improve business processes. Therefore, another aspect supporting the research hypothesis is that investments in intellectual capital (organizational and innovative) make a statistically significant impact of the capital on the growth of economic efficiency. The low level of these investments explains poor efficiency of the Russian economy.

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## ASSESSMENT OF THE INNOVATION FACTORS IMPACT ON ECONOMIC GROWTH IN RUSSIAN REGIONS

Svetlana Rastvortseva

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### Abstract

**Purpose:** The aim of the research is to test hypothesis that ensuring economic growth innovation is important for regions with higher level of development and it is less significant in explaining growth in other regions. Public and private R&D expenditure is very highly concentrated in a small number of leading regions: those closer to the productive frontier. Regions outside these high-technology cores tend to depend on less R&D-intensive forms of innovation and on technology transfer.

**Design/methodology/approach:** We have identified the following factors that are relevant for the regional growth: human capital, infrastructure, labour market, innovation, agglomeration and connectivity, productivity. As the innovation factor, we use number of patents, internal expenditures on R&D, expenditures on technological innovations, the number of staff engaged in R&D, the volume of innovative goods, works and services, innovative activity of organizations. Innovation can have a positive impact on long-term growth. The data has been collected in 83 Russian regions for 2005-2015. We use a power-mode regression model with constant elasticity.

**Findings:** Not all innovative factors have a positive effect on the regional economic growth. The inclusion of such factors as employment rate; internal expenditures on R&D; the number of staff engaged in R&D; the innovative goods, works and services; innovative activity of organizations; density of GDP is surplus. The analysis showed that they are not statistically significant. Partly we can explain it as the more successful regions develop due to conjuncture factors, and science and technology are not the reason for economic growth. Our hypothesis has not been confirmed.

**Research/practical implications:** In the case when the influence of the conjuncture factors on regional economic growth is great, it is difficult to assess the significance of innovation. The division of regions into groups according to the level of per capita GRP allows us to identify significant factors of innovation for growth. From the point of view of practical application, we see that the regions below average level of per capita GDP need the development of innovation. Such institutional factors as governance, leadership, capacity should consider an active role of innovation and work force.

**Originality/value:** On the example of the Russian regions we have shown that ensuring economic growth innovation is important for regions with below average level of development and it is less significant in explaining of growth in other regions.

**Keywords:** Regional economic growth, innovation factors, technological innovation, regions of Russia

**JEL Codes:** O32, O41, R12

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## **Introduction**

Economic growth is the cumulative measure for the entire activity originating in the society (Lucas, 2013, p. 53). The tasks for its support become priority in all countries of the world. Accelerated economic growth rates not only improve the population welfare, step up producers competitive power, predetermine the development of social aspects, but also increase inequality among regions for a number of parameters. To provide economic growth, internal and external conditions are created for all regions of the country, but only the most developed ones use the advantages with maximum efficiency. In this case, the level of interregional inequality increases. However, inverse trend is also possible, which explains the higher rates of economic growth that lagging regions can adopt technological, managerial and other innovations of more developed regions and imitate their successful practices. This process shall result in regions convergence (Barro et al., 2010, p. 36).

The traditional economic policy focused on using the measures such as direct investment of infrastructure development, subsidies and tax incentives to attract new companies to the lagging regions does not yield positive results in decreasing interregional imbalances. It is possible that to provide high rates of economic growth, it is important to identify the main factors for certain groups of regions in terms of a level of social and economic development. Previous studies have shown that the development of innovations and their impact on economic growth in the Russian regions has its own specifics (Rastvortseva, 2015).

The aim of the research is to test hypothesis that ensuring economic growth innovation is important for regions with higher level of development and it is less significant in explaining growth in other regions.

The paper is organized as follows. Section 1 gives us a short overview of the theoretical literature on the subject. After describing the problems of the innovations and regional growth in Russia over time in section 2, the research methodology and model specification are presented in sections 3 before the main results (section 4) and summarizing and drawing conclusions.

## **1 Theoretical background and bibliography**

To develop more effective measures, the European Union now generates a new wave of modern thinking in the sphere of the regional economic policy (Varga, 2017; Dvoulety, 2017). One may place emphasis the research aimed at growth stimulation and overcoming interregional

inequality directly through individual measures (for example, Barca, 2009) or in parallel with increased economic growth (World Bank, 2009).

The Russian regions differ in many observable parameters, so it is easy to choose some economic and cultural features and make them the engines of economic growth. To carry out the successful regional economic policy in implementing and using innovations to ensure economic growth, a model is needed that takes into account both the specific development of individual regions and the macroeconomic factors common to all ones. Such models will help the regional agencies to form the most effective combination of projects in accordance with the available budget and information.

Some results in the development of such models are already available. Macro, Sectoral and Territorial model – MASST was proposed by P. Capello in 2007 (Capello, 2007), Geographic Macro and Regional model – GMR from A. Varga (Varga, 2007), European Commission Model (RHOMOLO model) – A. Brandsma, O. Ivanova and A. Kants (Brandsma et al., 2015).

Thus, the Europe GMR model applies the following production function of knowledge for the region:

$$\dot{A}_{i,t} = RD_{i,t-k}^{\alpha_{A_1}} A_{N,t-k}^{\alpha_{A_2}} \quad (1)$$

where  $\dot{A}$  is a temporary change (increment) of new knowledge (it is measured by a number of patents and publications in two different equations) in the  $i$  region and  $t$  period of time;

RD is researches and developments (it is measured as a costs volume for researches and developments);

A is accumulated knowledge (it is measured by a total number of patents and publications, respectively);

$\alpha_{A_1}$  and  $\alpha_{A_2}$  are parameters, lower indices for which they are a region ( $i$ ), country ( $N$ )? time ( $t$ ) and lag of time ( $k$ );

$\alpha_{A_1}$  is a parameter of elasticity for new technological ideas relative to the researches, it is accepted as a measure for capacity of the regional researches and developments.

An effect level of research costs for new technological ideas is evaluated by a size of indicator  $\alpha_{A_1}$ , which value depends on the concentration of technologically intensive industries within the region and reputation of partners of interregional scientific-technical cooperation. The research concludes that having the equal level of costs for researches and developments, the regions may generate more technological ideas, while concentrating knowledge-intensive industries within its territory, attracting the first researchers inducing interregional research

cooperation. Capacity of scientific researches and developments is a key factor for concentration in the region of technologically intensive industries. Therefore, the regional policy focused on the support of scientific researches may lead to the higher level of knowledge and creation of centripetal force of economic activity concentration through the efficiency increase in the innovative sector.

In OECD countries, an empirical study was conducted to determine the factors of economic growth, including innovative ones. Innovation is shown to be important for regions with higher levels of development, but is less significant in explaining growth in other regions. Both public and private R&D expenditure as well as patenting activity are very highly concentrated in a small number of leading regions: those closer to the productive frontier. Regions outside these high-technology cores tend to depend on less R&D-intensive (and less easy-to-measure) forms of innovation and on technology transfer, which probably explains why innovation does not stand out as a growth factor in those regions (OECD, 2012).

Growth rates depend chiefly on the human capital, infrastructure and innovation already present in a region. Such institutional factors as governance, leadership, capacity include an active role to key actors focusing on innovation and work force. Innovation appears to be a critical pillar for advanced regions. Innovation can be promoted through strong open innovation supply chains, encouraging entrepreneurial activities and innovation clusters

## **2 Innovation and economic growth in different types of Russian regions**

Studying the innovations and their impact on the socio-economic development of the Russian regions, we have obtained some results earlier (Rastvortseva, 2015, 2016). Growth of innovative resources concentration is not always accompanied by increase of inequality among regions on relevant indicators. The crisis impacts negative on the development of innovation in non-central regions. Consequently, only the stable development of the economy will contribute to the dispersal of innovations in all regions of Russia. A stable relationship between the development of innovative and economic sectors in Russian regions appears in 2012.

The level of population education is weighty factor of economic growth, and a share of highly educated employees has positive influence on the rates of economic growth after three years. Influence of patent activity on regional economic growth is positive and statistically significant with lagged value of two years.

In this study, we will extend the observation period from 2005 to obtain a more representative sample, even if the influence of some factors becomes statistically insignificant.

In order to determine whether innovation affects the economic growth in regions with different levels of socio-economic development, we've divided 83 Russian regions into three groups:

- 1) above average GDP per capita (I group) – 23 regions;
- 2) 75-100 % of average GDP per capita (II group) - 20 regions;
- 3) below 75 % of average GDP per capita (III group) – 40 regions (table 1).

**Tab. 1: Average value of main growth indicators for the three groups of Russian regions in 2005-2015**

	<b>I group</b> <i>Above average GDP per capita</i>	<b>II group</b> <i>75-100 % of average GDP per capita</i>	<b>III group</b> <i>Below 75 % of average GDP per capita</i>
<b>GDP per capita, thous. rub.</b>	504681.15	218851.94	137687.16
<b>Regional growth, %</b>	1.1552	1.1426	1.1554
<b>Motorway density, km. per 1000 sq. km. of area</b>	152.5	169.5	198.5
<b>Higher education, share in employment, %</b>			
2002-2012 (lag3)	25.72	22.67	23.64
2003-2013 (lag2)	26.53	23.39	24.37
2004-2014 (lag1)	27.40	24.14	25.12
2005-2015	28.28	24.91	25.89
<b>Employment rate, %</b>	66.81	63.56	58.91
<b>Wage ratio, ratio to average wage in Russia, index</b>	1.42	0.847	0.68
<b>Patents, number of issued patents</b>	791.77	326.31	269.43
<b>Internal expenditures on R&amp;D, regional share, %</b>	3.13	0.953	0.22
<b>Expenditures on technological innovations, regional share, %</b>	2.36	1.566	0.36
<b>The staff engaged in R&amp;D, regional share, %</b>	2.88	2.07	0.32
<b>Innovative goods, works and services, mln. rub.</b>	49370.96	26738.00	6944.24
<b>Innovative activity of organizations, %</b>	11.24	9.2	8.04
<b>Population density, pop. per sq. km of area</b>	524.34	28.71	33.79
<b>GDP density, thous. rub. of GDP per sq. km of area</b>	313505.6	6247.6	4281.8

Thus, we see that the rates of economic growth are approximately equal in the three groups of regions. Economic growth rates vary from 1.1426% in group II to 1.1554 % in the group III. In the group I (above average GDP per capita), the highest share of employees with higher education (28.28%) is observed, high level of employment (66.81%), wages (1.42 ratio to average wages in Russian regions), number of patents (791.77) and other factors of innovation development. High density (population and GRP) also occurs on the regions of this group. High density of motorway occurs on the III group regions (below 75% of average GDP per capita – 198.5 km. per 1000 sq. km. of area). These regions exceed the II group by indicators of the proportion of workers with higher education and population density.

### 3 Model spesification

To assess the impact of innovative factors on regional economic development, we will use a power-mode regression model with constant elasticity:

$$\hat{Y}_t = \alpha \prod_{i=1}^m x_{i,t-1}^{b_i}, \quad (1)$$

where  $\hat{Y}_t$  is GRP, predicted in the time period  $t$ ;

$\alpha$  is absolute term of equation;

$x_i$  is innovative factors, included in the regression model;

$b_i$  is equation parameters - regression coefficients, particular elasticity coefficient of GRP on investigated factors;

$i$  is serial number of the factor;

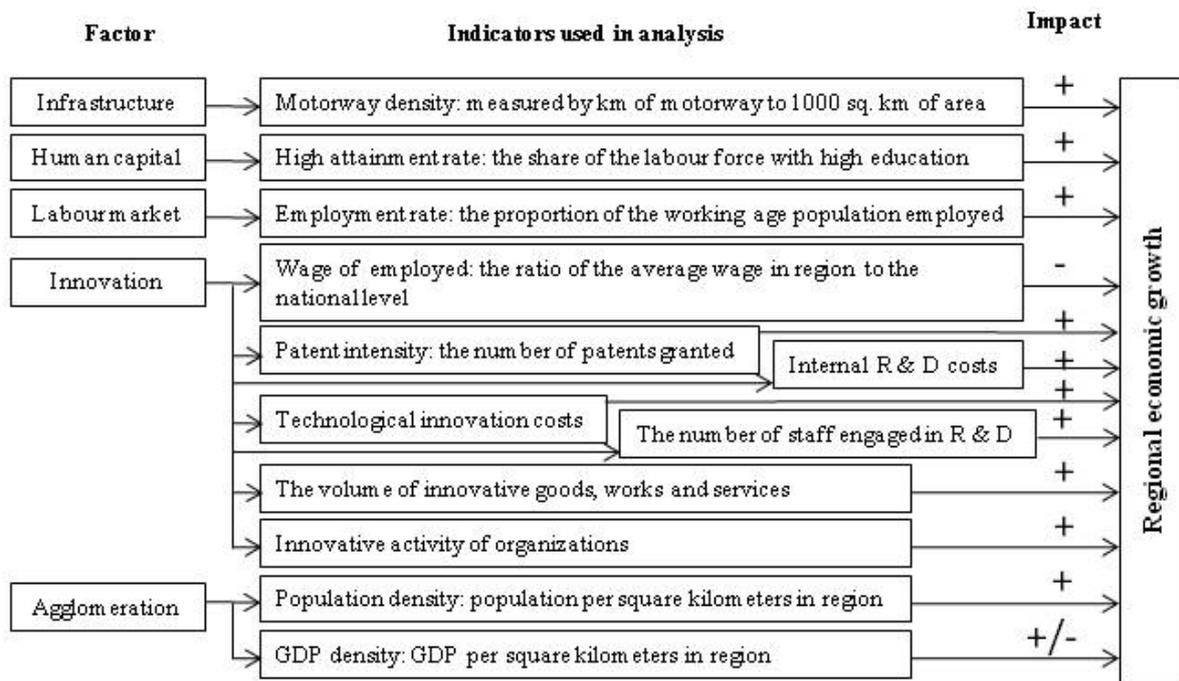
$m$  is number of factors, included in the model.

In linear representation the model looks in the following way:

$$\ln \left( \frac{\hat{Y}_{i,t}}{Y_{i,t-1}} \right) = \ln \alpha + \sum_{i=1}^m b_i \ln x_{i,t-1}. \quad (2)$$

As a productive indicator we denote the average growth of gross regional product for 2005-2015 (*GDP*). Let's define factor indicators. We have identified the following factors that are relevant for regional growth: human capital, infrastructure, labour market, innovation, agglomeration (fig.1).

**Fig.1. The main links of factors of economic growth in the region**



Constructed by the author

Neo-classical growth theories stress the role of physical capital as the main determinant of economic growth. Infrastructure as a density of motorway (*Infracast*) is used as a measure of physical capital (OECD, 2009). Endogenous growth theories rely on human capital as the main determinant of economic growth. High attainment rate (the share of higher educated workers – *High\_Edu* and *High\_Edu\_lag2* for 2-years lag) as a measure of human capital is used in the model. Employment rate and the average wage of employed (*Wage\_Ratio*) estimate labour market.

As the innovation factor internal expenditures on R&D, number of patents (*Patent*), expenditures on technological innovations (*Expend\_tech\_inn*), the number of staff engaged in R&D, the innovative goods, works and services, innovative activity of organizations used. Innovation can have a positive impact on long-run growth. The agglomeration factors are *density of population (Density\_pop)* and *density of GDP*.

#### 4 Interpretation of the results

The results of the preliminary analysis showed that in the Russian regions in general and in three groups in particular, the following factors of economic growth are statistically insignificant: employment rate; internal expenditures on R&D; the number of staff engaged in

R&D; the innovative goods, works and services; innovative activity of organizations; density of GDP. Let's construct models with other factors of economic growth (Table 2).

**Tab.2: Regression results, all Russian regions panel model, 2005-2015**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<i>Constant</i>	0.143*** (0.01)	0.365*** (0.051)	0.361*** (0.052)	0.487*** (0.056)	0.487*** (0.054)
<i>Infrast</i>	-0.0013 (0.001)	-0.00013 (0.001)	-0.0035 (0.003)	-0.021*** (0.0065)	-0.018*** (0.0056)
<i>High_Edu_lag2</i>		-0.07*** (0.016)	-0.067 (0.018)	-0.094*** (0.019)	-0.094*** (0.016)
<i>Wage_Ratio</i>			-0.019 (0.016)	-0.017 (0.019)	
<i>Patent</i>				-0.0059** (0.0029)	-0.0082*** (0.0026)
<i>Expend_tech_inn</i>				-0.0005 (0.0027)	
<i>Density_pop</i>				0.023*** (0.0061)	0.024*** (0.006)
<i>R<sup>2</sup></i>	0.00043	0.022	0.024	0.067	0.07
<i>Adj R<sup>2</sup></i>	-0.0007	0.02	0.021	0.061	0.063
<i>F</i>	0.53	0.000037	0.00006	$7.3 \cdot 10^{-11}$	$2.5 \cdot 10^{-12}$
<i>n</i>	902	900	900	852	870

\* Significant at the 5% level

The results of the empirical analysis prove that the most significant factors for the economic growth in all Russian regions are infrastructure (density of motorway), share of higher educated workers, patent activity and density of population. We include average wage of employed and expenditure on technological innovations because they are significant for some groups of regions. Let's construct models of economic growth for the group I of Russian regions - above average GDP per capita (Table 3).

**Tab.3: Regression results, Russian regions (I group - above average GDP per capita) panel model, 2005-2015**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<i>Constant</i>	0.143*** (0.0087)	0.402*** (0.102)	0.408*** (0.107)	0.51*** (0.105)	0.493*** (0.124)
<i>Infrast</i>	-0.002 (0.002)	-0.0002 (0.002)	-0.002 (0.004)	-0.008*** (0.003)	-0.01*** (0.003)
<i>High_Edu_lag2</i>		-0.083*** (0.032)	-0.088** (0.036)	-0.131*** (0.04)	-0.11*** (0.037)
<i>Wage_Ratio</i>			0.016 (0.025)	-0.019 (0.028)	
<i>Patent</i>				0.0006 (0.005)	
<i>Expend_tech_inn</i>				-0.0083** (0.004)	
<i>Density_pop</i>				0.0156*** (0.004)	0.011*** (0.003)
<i>R<sup>2</sup></i>	0.002	0.037	0.04	0.1	0.06
<i>Adj R<sup>2</sup></i>	-0.002	0.029	0.03	0.07	0.04
<i>F</i>	0.46	0.01	0.024	0.0012	0.0027
<i>N</i>	243	243	243	223	243

\* Significant at the 5% level

The results of the empirical analysis prove that the most significant factors for the economic growth in the group I of Russian regions are *infrastructure* (density of motorway), share of higher educated workers and density of population. Let's construct models of economic growth for the group II of Russian regions - 75-100 % of average GDP per capita (Table 4).

**Tab.4: Regression results, Russian regions (II group - 75-100 % of average GDP per capita) panel model, 2005-2015**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<i>Constant</i>	0.158*** (0.0198)	0.425*** (0.095)	0.439*** (0.115)	0.503*** (0.117)	0.52*** (0.105)
<i>Infrast</i>	-0.006 (0.004)	-0.002 (0.006)	0.007 (0.009)	-0.046** (0.022)	-0.054*** (0.017)
<i>High_Edu_lag2</i>		-0.092*** (0.033)	-0.105** (0.043)	-0.082* (0.045)	-0.061*** (0.034)
<i>Wage_Ratio</i>			0.094 (0.073)	0.054 (0.0696)	
<i>Patent</i>				-0.012 (0.0096)	-0.018*** (0.0067)
<i>Expend_tech_inn</i>				-0.0048 (0.0048)	
<i>Density_pop</i>				0.051*** (0.017)	0.053*** (0.016)
<i>R<sup>2</sup></i>	0.003	0.026	0.031	0.064	0.058
<i>Adj R<sup>2</sup></i>	-0.001	0.017	0.017	0.037	0.04
<i>F</i>	0.423	0.0597	0.079	0.028	0.011
<i>N</i>	220	220	220	220	220

\* Significant at the 5% level

The results of the empirical analysis prove that the most significant factors for the economic growth in the group II are infrastructure (density of motorway), share of higher educated workers, patent activity and density of population. Let's construct models of economic growth for the group III of Russian regions - 75 % of average GDP per capita (Table 5).

**Tab.5: Regression results, Russian regions (III group - below 75 % of average GDP per capita) panel model, 2005-2015**

	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Constant</i>	0.148*** (0.0197)	0.334*** (0.064)	0.368*** (0.062)	0.523*** (0.0542)	0.496*** (0.061)
<i>Infrast</i>	-0.001 (0.004)	0.0038 (0.0039)	-0.007 (0.0052)	-0.0532*** (0.009)	-0.057*** (0.009)
<i>High_Edu_lag2</i>		-0.066*** (0.0196)	-0.078*** (0.018)	-0.073*** (0.016)	-0.079*** (0.019)
<i>Wage_Ratio</i>			-0.143*** (0.033)	-0.131*** (0.027)	-0.11*** 0.028
<i>Patent</i>				-0.013*** (0.0026)	-0.0091*** (0.0026)
<i>Expend_tech_inn</i>				0.0057 (0.003)	
<i>Density_pop</i>				0.05*** (0.01)	0.056*** (0.009)
<i>R<sup>2</sup></i>	0.001	0.017	0.051	0.15	0.14
<i>Adj R<sup>2</sup></i>	-0.002	0.012	0.044	0.13	0.13
<i>F</i>	0.83	0.025	0.000049	6.7·10 <sup>-12</sup>	1.3·10 <sup>-12</sup>
<i>n</i>	439	437	437	409	427

\* Significant at the 5% level

The coefficient of determination in the models is low because the model includes mainly innovative development factors, rather than traditional ones - labor and capital. We also note that GRP growth rates largely depend on the conjuncture factors: the dynamics of prices for oil, gas, non-ferrous and ferrous metals (which is important for the Russian economy), foreign policy, and the national currency rate. Innovative factors influence economic growth in the long term and, often, conjuncture factors do not allow an adequate assessment.

Let's consider the received models in more details. For 83 regions of Russia the model, which includes all the most significant factors, looks as follows:

$$\frac{GDP_t}{GDP_{t-1}} = 0.478 \cdot Infrast^{-0.018} \cdot High\_Edu\_lag_2^{-0.094} \cdot Patent^{-0.082} \cdot Density\_pop^{0.024}$$

(3)

We see that population density positively affects economic growth (as in models by groups). This confirms the provisions of the new economic geography (NEG) on agglomeration effects from the territorial concentration of the population. Theories of the NEG say that

agglomeration effects are accompanied by the spread of knowledge that contributes to innovative development. A negative (but statistically significant) impact on economic growth is provided by a share of higher educated workers and patent activity. At present, measures are being taken in Russia to increase the attractiveness of secondary professional education, since specialists of this level are in demand in the labor market, and a low supply leads to inefficient high wages.

In the third group (less developed regions), the wage factor has a significant impact on economic growth. The negative influence of patent activity confirms the conclusions were made earlier by Rastvortseva (2015) about the insufficient level of development of this sector. We see that the largest number of patents falls on the I group of regions (an average of 791.77 issued patents per region per year in 2005-2015). But it is in this group of regions that the influence of this factor is not statistically significant. The model for the first group of regions has the form:

$$\frac{GDP_t}{GDP_{t-1}} = 0.493 \cdot Infracst^{-0.01} \cdot High\_Edu\_lag_2^{-0.11} \cdot Density\_pop^{0.011} \quad (4)$$

Note that when six factors of economic growth are included, a significant connection is observed with the expenditures of technological innovation. Economic growth in the II group of regions is formed due to such innovative factors as share of higher educated workers and patent activity. The influence of both factors is negative. The model has the following form:

$$\frac{GDP_t}{GDP_{t-1}} = 0.52 \cdot Infracst^{-0.054} \cdot High\_Edu\_lag_2^{-0.061} \cdot Patent^{-0.018} \cdot Density\_pop^{0.053} \quad (5)$$

We have classified 40 regions of Russia as less developed regions (below 75 % of average GDP per capita). The economic growth in this group of regions has a statistically significant influence factors - higher education, patent activity, wage level:

$$\begin{aligned} \frac{GDP_t}{GDP_{t-1}} = & 0.496 \cdot Infracst^{-0.057} \cdot High\_Edu\_lag_2^{-0.079} \cdot Wage\_ratio^{-0.11} \times \\ & \times Patent^{-0.0091} \cdot Density\_pop^{0.056} \end{aligned} \quad (6)$$

The conclusion of the analysis that a high level of wages negatively affects the rates of economic growth seems logical. The negative influence of the density of motorway on economic growth, in our opinion, can be explained by the large geographical areas of the Russian regions. Roads are important, but not exhaustive type of transport infrastructure. In richer regions (Group I) air, sea and pipeline transportation is important. We think that this direction can be investigated additionally.

We will try to explain the negative impact of innovation factors on economic growth by the following reasons:

1) as a resultant indicator, we accept not the socio-economic development of the region at a particular point in time, but the economic growth. This corresponds to the purpose of the study, but does not exclude a significant influence of the conjuncture factors. The regions grow faster not because of the innovations that have been accumulated over the years, but because of the successfully external conditions;

2) innovations at the current stage of the Russian economy development are not sufficiently demanded by the regions for growth. Their returns are low, there are alternatives to obtaining a faster profit. Earlier it was shown that the impact of innovations on the development of the Russian regions economy has become statistically significant since 2012. We think that, when more data are available for a representative sample, we can additionally investigate the period from 2012.

3) imperfection of official statistics on indicators of innovation. If the statistics reflect the real state of affairs by the share of higher employed workers and the number of issued patents, it is quite difficult to assess the reliability of such indicators as internal costs of research and development, the cost of technological innovation.

## **Conclusion**

Thus, the hypothesis put forward by us that regions with higher rates of economic growth are more dependent on innovations, has not been confirmed. In these regions, the influence of conjuncture factors is great. In regions with medium and below average levels of development, the link between economic growth and innovation is stronger. The density of the population positively influences the growth in the Russian regions. This confirms the conclusions of the new economic geography and suggests that agglomeration effects from the geographical concentration of the population will arise, including from the dissemination of knowledge, which will contribute to innovation.

The negative influence of the density of motorway can be explained by the large geographical areas of Russian regions - road transport is not the main one in all regions. Negative, but statistically significant, influence of the share of higher educated workers indicates the presence of imbalances in the labor market. Patent activity has an impact on economic growth in groups II and III. In the regions of the III group, the level of wages has a

negative impact on economic growth. This indicates an insufficient level of development of this sector.

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## INNOVATIVE INDUSTRY SECTORS IN WORLD ECONOMIC CENTERS

Piotr Raźniak – Sławomir Dorocki – Anna Winiarczyk-Raźniak

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### Abstract

**Purpose:** The purpose of this paper is to analyze the geographic distribution of key corporate headquarters' locations – and changes therein – for innovative sector corporations. The paper attempts to identify innovative sectors in world economic centers throughout the world and discuss contemporary processes affecting changes in their hierarchy.

**Design/methodology/approach:** The analysis in the paper uses data obtained from the “Forbes Global 2000” list of corporations aggregated at the level of major metropolitan areas home to major corporate headquarters. The “innovativeness index for cities” is based on the financial potential index for innovative sector companies (acronym: FPIS), which is calculated using selected economic and financial data such as return on assets, return on sales, and company market value. In addition, the index is also based on the number of corporate headquarters per city.

**Findings:** Therefore, in spite of globalization and relocation of production, the largest revenue growth is still recorded by companies headquartered in the United States, which is particularly evident in the case of San Jose. A significant decrease of the importance of the innovative sector was recorded by the Japanese World Economic Centers, and especially that of Tokyo. In Asia, a few newer innovation centers such as Hong Kong, Bangalore, and New Delhi have emerged in the last few years, while several U.S. cities have declined substantially in terms of their role in the innovative sector.

**Research/practical implications:** The analysis of the impact of innovative sectors on the development of world economic centers will show their importance in the generation of the command and control function of cities in the event of economic crisis.

**Originality/value:** The issue of the command and control function of cities created by corporations headquarters their international connectivities are point of interest for several years. The new concept is, the idea of World Economic Center where the city has strong command and control function, even in the main industry sector economic crisis. This study shows the impact of innovative sector to the world economic center cities power.

**Keywords:** innovation, city, command and control function, corporation, world economic centers

**JEL Codes:** F02, G03

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## Introduction

*“...Globalisation represents a transfer of power from national states  
to a network of global cities; the world today  
is more cities than countries...”*

A.T. Kearney (2012)

Economic analysis is most often focused on country-level analysis and that of selected companies and even entire continents. However, the economic potential of cities is less often analyzed, although this type of research has been conducted since the 1960s (e.g. Hall 1966). A number of models of cities as world-leading economic centers have been produced since the 1970s (Hymer 1972, Friedmann 1986, Sassen, 1991) and connectivity between cities has been investigated (Beaverstock, Smith, Taylor 1999, Derudder, Hennemann 2014, Meeteren, Bassens 2016). In addition, the financial performance of the largest corporations is analyzed in terms of their command and control function in the world economy. The largest companies perform a leading role in the world economy (Sassen 2000), which has led to the formulation of the command and control function concept of cities (Csomós 2013), whereby the potential of cities is determined by the sales revenue, net income, market value, and asset value of the largest companies listed by Forbes Global 2000 ([www.forbes.com](http://www.forbes.com)).

The strength of a city may also manifest itself in its ability to resist economic crisis. This has led to the emergence of a new concept known as the World Economic Center (WEC), which is a way to show the rank of a city relative to the value of selected companies by sector as well as the stability of each given city in the event that a given sector begins to lag. This method of analysis provides not only information on the economic potential of a city, but also on its path of development and specialization. In short, world economic centers are cities that maintain their command and control function in the world economy in the event of a key crisis in their dominant economic sector. World Economic Center concept assumes that Stability of the city can be good if it has at least four sectors, because the loss of the dominant sector does not significantly change the command and control function of the city and economic stability during an economic crisis. (Raźniak, Dorocki, Winiarczyk-Raźniak 2017).

It is also important that the potential of world economic centers be created by leading sectors, which are not at risk of structural change and determine competitive advantage in the global markets. In today's economy, sectors often deemed “not vulnerable” include IT and the life sciences, which also includes the pharmaceutical industry and biotechnology or what is

often called “healthcare” (Dorocki 2014, Dorocki, Boguś 2014). It is these two sectors and related collaboration (e.g. nanotechnology) (Dorocki, Kula 2015) that currently determine the rank of a given region or country on the world innovativeness scale. Innovative sectors of the economy rely on several key factors including human capital, R&D infrastructure (i.e. research institutions), investment capital, and a legal framework (Dorocki, Brzegowy 2014). In most cases, large urban centers already fulfill these requirements, with all key factors available on-site. However, historical differences as well as differences in “soft” factors strongly differentiate these sectors’ rates of development across geographic space. An increasingly common trend – driven by current globalization processes – is the relocation of innovative sectors to developing countries as well as peripheral areas of cities (Wójtowicz, Dorocki 2014, Dorocki et al. 2014).

The purpose of this paper is to analyze the geographic distribution of key corporate headquarters’ locations – and changes therein – for innovative sector corporations. The paper attempts to identify innovative sectors in world economic centers throughout the world and discuss contemporary processes affecting changes in their hierarchy.

## 1 Methods

The analysis in the paper uses data obtained from the “Forbes Global 2000” list of corporations aggregated at the level of major metropolitan areas home to major corporate headquarters. For a city to be considered a World Economic Center, it must be home to at least four sectors (Raźniak, Dorocki, Winiarczyk-Raźniak 2017) of the economy based on the classification by Standard & Poor’s (Global Industry Classification Standard – GICS). The “innovativeness index for cities” is based on the financial potential index for innovative sector companies (acronym: FPIS), which is calculated using selected economic and financial data such as return on assets, return on sales, and company market value. In addition, the index is also based on the number of corporate headquarters per city.

$$FPIS = \sum(\log(HQ); ai; ri; mv) \quad (1)$$

HQ – number of corporate HQs

ai – return on assets (ROA)

ri – return on sales (ROS)

mv – market value

$$ai = \frac{p}{a} * 100 \quad (2)$$

$$ri = \frac{p}{r} * 100 \quad (3)$$

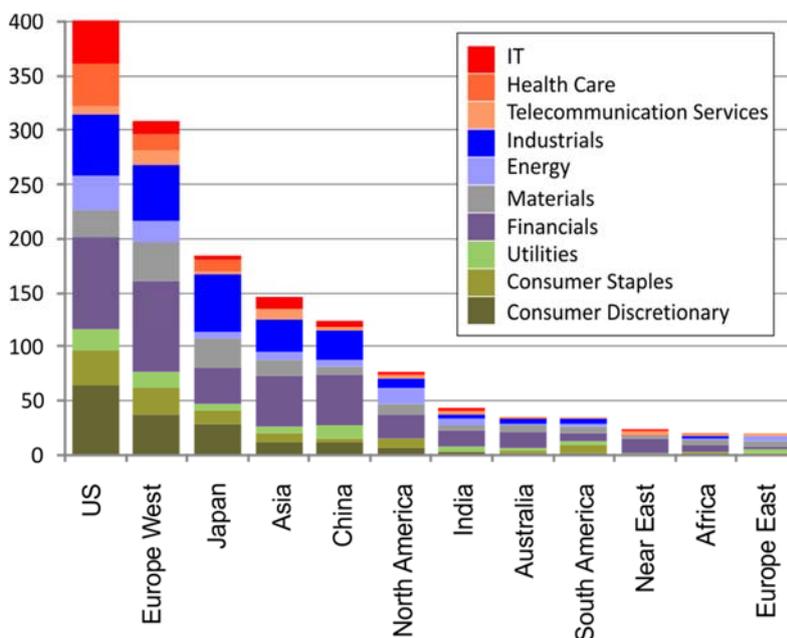
where: p - profit, a - assets, r - net income

City index values obtained for two years were normalized in order to yield comparable data by using the standard deviation of FPIS and its mean value.

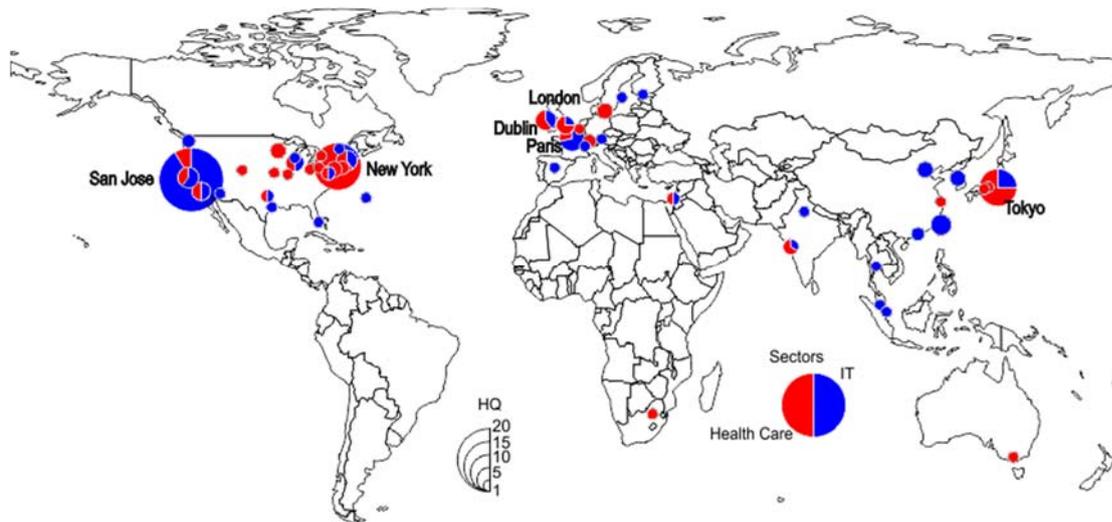
## 2 Location of the headquarters of the largest corporations in the world.

All of the 10 sectors listed by Standard & Poor's are found in the United States, Japan, and China. The largest number of corporate headquarters are found in the United States or 533 in 2012. This is more than the combined number for Europe, Africa, and Australia. Most studied regions are dominated by financials: Middle East (60.8%), Australia (42.8%), China (37.9%). The overall number of highly ranked corporations headquartered in Eastern Europe is rather small resulting in the presence of only six sectors in the region. The most often encountered sectors are materials and energy (25% each), while the financial sector ranks fourth. In Japan, financials constitute the second largest group of firms, with the industrial sector being dominant (29.3%). Significant variances are noted across the world in terms of the number of headquarters and sectors. The dominant sector among major corporations is financials, while sectors deemed innovative such as healthcare and IT stand at only 10.6% and are located mainly in the United States (Fig. 1).

**Fig. 1: Number of corporate HQs by sector – large differences by continent; therefore, regions are used in the study instead.**



**Fig. 2: Corporate HQs in 2012 for the IT and healthcare sectors (specialization: eastern and western USA).**



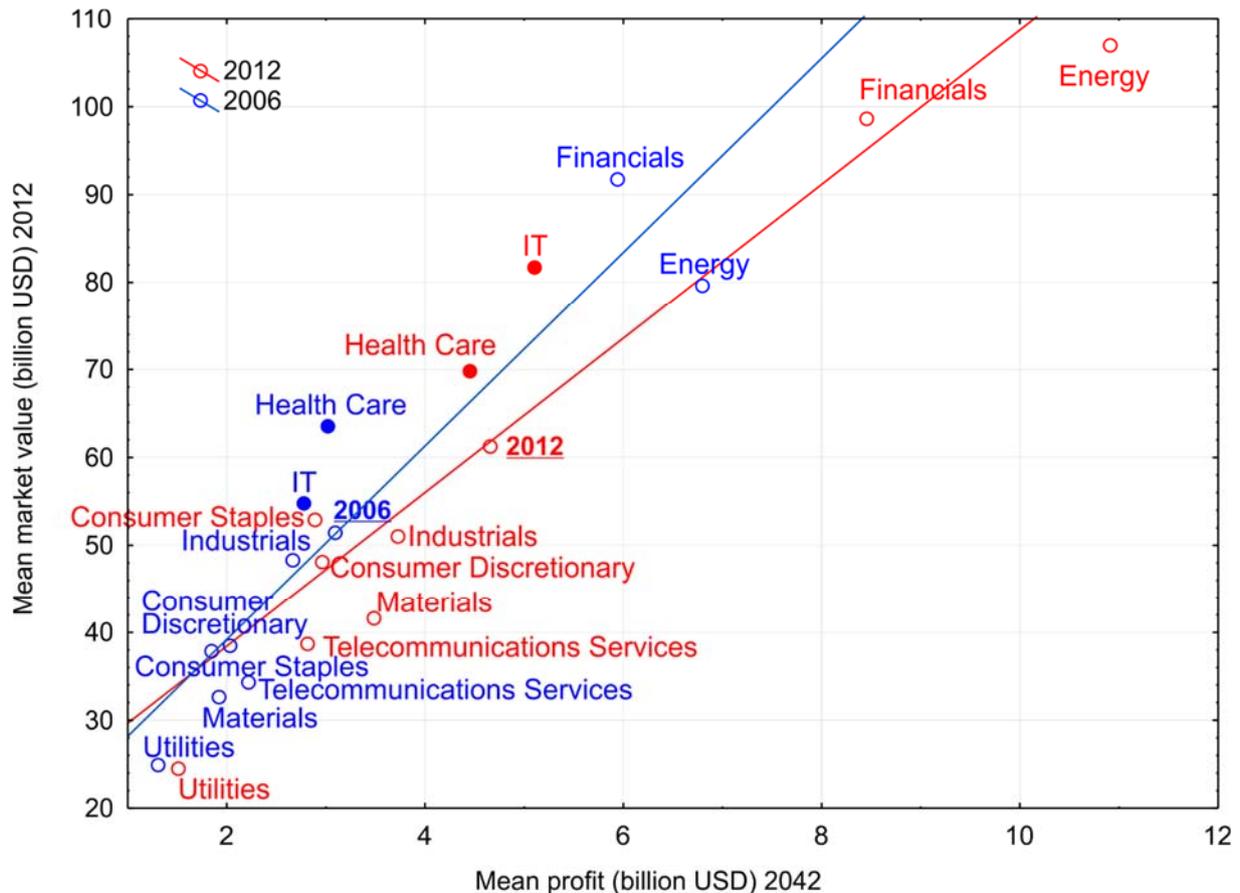
World Economic Centers in the United States are strongly specialized in the area of innovative sectors such as IT and healthcare. The western part of the country is dominated by IT, especially the city of San Jose, while the central and eastern parts are dominated by healthcare. In Europe, the distinction between east and west can also be observed, although the reasons for this are different. None of the examined companies can be found in Eastern Europe, although the area is home to corporate headquarters listed by Forbes (Raźniak, Winiarczyk-Raźniak 2015). This area of Europe does feature innovative companies, although these are fairly small (Raźniak, Dorocki, Winiarczyk-Raźniak, Płaziak, Szymańska, A.I. 2017, Raźniak, Dorocki, Winiarczyk-Raźniak 2018). The western region of Europe is dominated by Dublin, while London ranks second. Both cities are dominated by the healthcare sector, with Dublin at 60% and London 75%. Healthcare sector companies from the Forbes list are also found in Asia. In Japan, healthcare is dominant, while IT maintains a lead in other regions of Asia. In addition, both sectors are poorly represented in Africa and Australia (1 company each), with no companies at all in South America (Fig. 2).

### 3 Financial potential of the IT and healthcare sectors

Companies in the IT and healthcare sectors are some of the wealthiest companies in terms of market value and profits. Both in 2006 and 2012, the mean market value and profits per company exceeded mean values for all 2,000 analyzed companies. In addition, both key indicators increased substantially in the period 2006 – 2012. Market value for the IT sector increased 49.2% and 10.0% for the healthcare sector. IT profits increased 84.3%, while profits

for the healthcare sector increased 47.9%. The most valuable companies are those in sectors such as financials and energy, where the mean market value of a company is about 100 billion USD and the mean profit level is 10 billion USD per year. Research has shown that innovative sectors follow main trends set by all the examined corporations and continue to improve their financial performance (Fig. 3).

**Fig. 3: Mean market value and profit per company by sector in 2006 and 2012.**



**Tab. 1: Financial performance of innovative sectors in 2012 per company.**

Sector	Employees per HQ (mean) (1000 os)	Mean w (billion USD)				
		cash on hand	assets	revenue	market value	profit
Health Care	28,20	8,81	56,05	45,21	69,92	4,44
IT	48,74	12,67	45,87	39,25	81,77	5,10

Healthcare sector companies tend to be smaller in terms of the number of employees. This may be a sign of greater innovativeness, as research teams working on new technologies do not need to be too large. However, research and equipment may be costly, which may lead to more valuable assets relative to IT. Despite higher revenues, healthcare sector companies are

less profitable than IT companies due to larger costs related to long-term clinical research and also long product implementation processes. On the other hand, IT companies tend to be more profitable due to fewer investment costs as well as a more “commercialized” business model (Tab. 1).

**Tab. 2: Changes in rank – potential index for the IT and healthcare sectors together.**

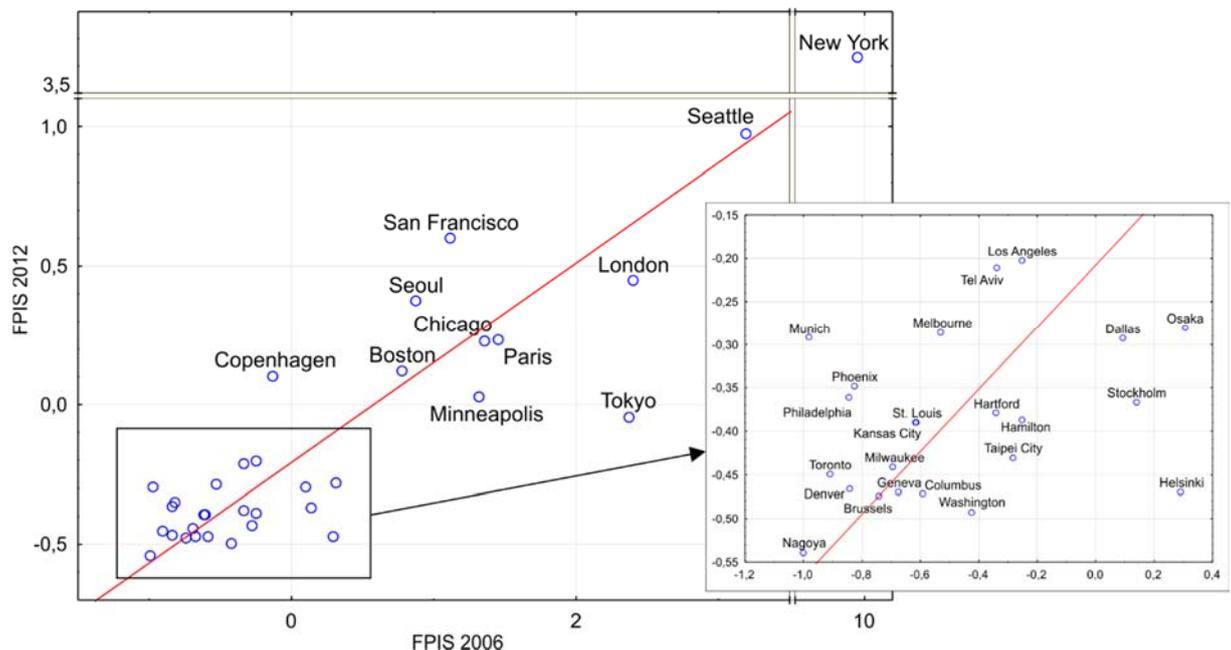
City	Rank 2006	Rank 2012	City	Rank 2006	Rank 2012	City	Rank 2006	Rank 2012
San Jose	x	1	Osaka	11	21	Montreal		41
New York	1	2	Melbourne	25	22	Toronto	40	42
Seattle	2	3	Munich	41	23	Pittsburgh	x	43
Basel	x	4	Dallas	15	24	Denver	37	44
San Francisco	8	5	Singapore	x	25	Geneva	32	45
Bangkok	x	6	Madrid	x	26	Helsinki	12	46
London	3	7	Phoenix	36	27	Columbus	26	47
Seoul	9	8	Philadelphia	38	28	Brussels	35	48
Paris	5	9	Stockholm	14	29	Washington	24	49
Chicago	6	10	Hartford	23	30	Shanghai	x	50
Boston	10	11	Miami	x	31	Nagoya	42	51
Mumbai	x	12	Houston	x	32	Hong Kong	x	52
Copenhagen	16	13	Hamilton	18	33	Austin	13	x
Dublin	x	14	St. Louis	29	34	Zurich	17	x
Minneapolis	7	15	Kansas City	30	35	Atlanta	21	x
Tokyo	4	16	Johannesburg	x	36	Bridgeport	27	x
Shenzhen	x	17	Kuala Lumpur	x	37	Berlin	28	x
Beijing		18	Delhi	x	38	Providence	31	x
Los Angeles	19	19	Taipei City	20	39	Kyoto	34	x
Tel Aviv	22	20	Milwaukee	33	40	Cincinnati	39	x

x - not listed as part of the ranking

The American city of San Jose was ranked first in the world in 2012. This is also quite interesting, as it did not appear in the ranking at all in 2006. Second and third place was given to New York and Seattle (USA). Fourth place went to the Swiss city of Basel, which is not an EU city. Developing markets are noteworthy with dynamically growing innovative sectors. In 2012, cities located in developing countries that joined the Forbes ranking included Bangkok (Thailand), Mumbai (India), Shenzhen (China), Beijing (China), Johannesburg (South Africa), and Delhi (India). This may have been due to the relocation of corporate headquarters as well as production jobs from more affluent to less affluent countries with lower labor costs. Some examples of the decline of innovative sectors in affluent countries include U.S. cities such as

Austin, Atlanta, Bridgeport, Providence, and Cincinnati as well as Western European cities such as Zurich and Berlin (Tab. 2).

**Fig. 4: Financial potential of IT and healthcare companies – cities ranked in 2006 and 2012.**



Among cities qualified as global centers of innovation in 2006 and 2012, New York City holds a position that may be described as dominant despite being second relative to San Jose. New York City remains an important center of innovative industries, especially in the area of healthcare. The next position among world IT leaders is held by Seattle, followed by a number of innovative cities such as London, Paris, and Tokyo. Nevertheless, these traditional centers of innovation appear to be gradually declining in favor of San Francisco, Seoul, and Copenhagen. Established centers of innovation appear to be in decline due to the rise of newer and smaller centers of innovation such as Tel Aviv (Israel) and Munich (Germany) as well as Melbourne (Australia). Traditional centers such as Osaka, Dallas, Stockholm, and Helsinki are all on the decline due to increasing globalization and technological progress in new regions of the world – i.e. U.S. Pacific Coast, Asian Far East, Asian Middle East (fig. 4). This emergence of the new innovative regions is driven by national government policy, investment in human capital, and growing educational opportunities in developing countries.

## Conclusion

Current globalization processes change the distribution of the headquarters of multinational corporations and trigger changes in the hierarchy of key cities in the global economy. This is particularly evident in the case of the innovative sector, which is now a major factor in the economic development of selected countries and provides a high level of development at the country level and across the world. The financial potential of innovative sector companies is located mainly in the United States. Innovative companies require a large number of highly qualified workers. Therefore, in spite of globalization and relocation of production, the largest revenue growth is still recorded by companies headquartered in the United States, which is particularly evident in the case of San Jose. A significant decrease of the importance of the innovative sector was recorded by the Japanese world economic centers, and especially that of Tokyo. In Asia, a few newer innovation centers such as Hong Kong, Bangalore, and New Delhi have emerged in the last few years, while several U.S. cities have declined substantially in terms of their role in the innovative sector. The analysis of the impact of innovative sectors on the development of world economic centers will show their importance in the generation of the command and control function of cities in the event of economic crisis. Future research may include an attempt to determine the role of the innovative sector in modern cities.

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## SUSTAINABLE ENTREPRENEURSHIP: HOW TO MEASURE FUTURE SUSTAINABILITY IMPACT FOR EARLY STAGE NEW VENTURES

Malte Recker – Ingo Michelfelder

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### Abstract

**Purpose:** The paper provides an overview on existing measurement approaches and the respective suitability to predict, to support and thus to increase the future sustainability value generation of new ventures along the three domains: Economic, environmental and social impact. It aims to identify required complements and adjustments to close the existing gap of suitable measurement tools, determining holistic sustainability for new ventures.

**Design/methodology/approach:** A systematic literature review is chosen to assess existing measurement tools, methods and concepts from theory across relevant disciplines. Scope of measurement and applicability in the described context are the main assessment criteria.

**Findings:** The literature review reveals that I.) there is a lack of sustainability measurement tools appropriate for early stages of a new venture, II.) that holistic measurement tools, covering environmental, social and economic value generation, are needed and that III.) the relative improvement of generated value needs to be taken into account in order to allow a meaningful comparison of different ventures and business models and to significantly reduce the complexity. IV.) Research needs to integrate initial findings from other studies looking at success factors covering the social and environmental value generation – rather than the economic outcome only.

**Research/practical implications:** The research findings provide a basis for measuring, predicting and increasing sustainability impact generated from new ventures. The suggested complements and adjustments are shared for use in other benchmarking approaches and to help establishing the research field of sustainable entrepreneurship. Its application will provide important decision criteria for new ventures (how to increase sustainability), early stage investors (where to invest), policymakers (which types of ventures and business models to support) and sustainability dedicated accelerators (how to support the sustainability generation of new ventures).

**Originality/value:** The contribution to existing concepts and tools is especially the starting development of *early stage sustainability measurement and prediction approaches* for new ventures. The literature review has shown that measurement tools are often too complex for early stage measurement. It is at these stages however, that public funds are invested and private investors decide on which business to help to achieve the growth stage.

**Keywords:** Sustainable entrepreneurship, sustainability measurement, sustainability benchmark

**JEL Codes:** L26, O3, O35

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## Introduction

The problem is that measuring sustainability impact across the three domains (economic, social and environmental) is extremely challenging, as in some cases it is even hard to judge whether an organizational sustainability impact is positive or negative (Hahn, Preuss, Pinkse and Figge, 2014; Jay and Gerard, 2015). Best practices currently used primarily in mature organizations such as the Triple Bottom Line, the Global Reporting Initiative, and Corporate Sustainability Reporting are very valuable, but are criticized for important shortcomings (Milne and Gray, 2013). And the measurement problem becomes even bigger in early stages of new ventures, due to uncertainty, unavailability of data and frequent changes to products, services and business models. However, without measurement, we cannot make informed choices which new ventures have the potential highest sustainability impact. Additionally, some elements of our traditional criteria for successful new venture support systems (accelerators, investors and policies) are likely to be inappropriate in this context, as we currently cannot fully adjust them to maximize sustainability impact. Knowledge about the most important indicators and success factors will increase the outcome.

Sustainability has been identified as a key future path for entrepreneurship research (Shepherd, 2015) and new ventures as a key for disrupting existing production and consumption systems (Hockerts and Wuestenhagen, 2010). Significant resources are spent by governments, investors and new ventures on sustainable entrepreneurship without having solved the problem of measuring, predicting and increasing respective impact.

The Brundtland Commission first mentioned sustainability in the still used context in 1987, stating the overarching and inherent objective as:

*“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”* (WCED, 1987)

An applicable and more detailed definition of sustainability for the context of this research can be derived from sustainable entrepreneurship research:

*“Sustainable entrepreneurship is focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society.”*

(Shepherd and Patzelt 2011, p.142)

The definition captures two important aspects. First, the broadly accepted three sub-domains economic, environmental and social sustainability are mentioned by this definition,

emphasizing also non-economic objectives. Second, it states the necessary ability of continuing an activity indefinitely into the future as a characteristic of sustainable entrepreneurship, hence sustainability is future orientated.

Previous research has developed measurement approaches across all domains of sustainability in various complexity. Measurement of economic impact, e.g. growth and profit for new ventures is well accepted and already performed by the majority of ventures across the globe. Environmental impact measurement has a younger history, resulting in both broader reporting approaches (e.g. GRI, CDP or IR) and specific methods such as life cycle assessment or ecosystem valuation. Latest research contributes in the field of social impact measurement, developing measurement tools to quantify impact in this domain. However, these existing methods need to be adapted for the purpose described above, as they are either measuring only parts of the total sustainability value generation, are too complex and time intense for early stage new ventures or do not offer the possibility to compare sustainability impact with help of single denominators.

Consequently, the research question to be answered in this article is: *What approaches exist to measure sustainability impact, how suitable are they to determine holistic sustainability for new ventures and what supplements or adjustments are required to determine sustainability for new ventures in early stages?*

The contribution to existing concepts and tools is especially the starting development of future sustainability measurement and prediction approaches for new ventures in early stages. The literature review will show that measurement tools are often too complex for early stage measurement. It is at these stages however, that public funds are invested and private investors decide on which business to help to achieve the growth stage.

## **Methodology**

A systematic literature review is chosen to assess existing measurement tools, methods and concepts from theory across relevant disciplines. By applying a systematic approach using an explicit and repeatable search algorithm, it is ensured that the existing literature is screened in order to generate reliable and high-quality findings (Tranfield et al., 2003) (Petticrew and Roberts, 2006). Although the large amount of information creates challenges, such as data synthesis (Pittaway et al., 2004), it is the preferred method to deal with the different research streams existing for the broad field of sustainability.

We conducted the review in three steps: first, the literature collection, where the selection algorithm is applied on the defined sources. Second, the literature analysis, providing the required insights for the following synthesis of results and consolidation into frameworks before required adjustments and complements are discussed.

Our goal in this review is to create a comprehensive overview of existing measurement approaches and a conceptual consolidation in developed frameworks, rather than an empirical analysis. The methodical limits, focusing on breadth rather than on depth for the reviewed approaches can be accepted, since the review is performed as a starting point of further research towards the goal of measuring future sustainability for early stage new ventures.

### **Literature selection criteria and search words**

Removing subjectivity during the data collection process is the key characteristic of a systematic literature review and differentiates the selected approach from others, such as employing a panel of experts and using knowledge of existing literature (Crossan and Apaydin, 2009). Hence, the planning stage is the most important step, defining selection criteria upfront (Tranfield et al., 2003).

Being aware of the broad meaning of sustainability and its multiple usage in different fields, we needed to define the search words to cover breadth but also to identify measurement approaches and explicit application for early stage new ventures. In addition different research streams use different keywords describing similar content (e.g. sustainable entrepreneurship vs. social entrepreneurship). Therefore we both used sustainability and its derivatives (sustain\*) as well as the three domains according to the definition mentioned above (economic, environmental or ecological and social). Similarly, we included related search words to further describe the topic. The resulting search word stream ensures that all key words are represented in one of the defined forms:

*“(Sustain\* OR Economic\* OR Environmental OR Ecologic\* OR Social) AND (Impact OR Value OR Performance) AND (Measure\* OR Report\* OR Account\* OR Evaluate\* OR Benchmark\*) AND (New Venture OR Startup)”*

### **Key data sources and search restrictions**

Data sources were limited to peer-reviewed journals, being considered as validated knowledge and representing state of the art research in this field (Podsakoff et al., 2005).

We selected to use Web of Science to collect the literature, using the Science Citation Index Expanded (SCI-EXPANDED) containing data from 1945 to present and the Social Sciences Citation Index (SSCI) with publications from 1956 to present. Being one of the most

comprehensive databases and having suitable analysis options (Crossan and Apaydin, 2009) the source fitted well for this review.

Our initial search in the data base for “topic” contained the mentioned search words for document type “article”, language “English”, without any additional restrictions. Books, book chapter and conference papers were excluded to ensure availability and to reduce variability in peer review processes (Jones et al. 2011).

## Literature collection

The team, using the predefined key words and selected databases with named restrictions, conducted collection. All findings were checked against exclusion criteria and relevant titles were selected (Jones et al., 2011). The resulting list was further reviewed and analyzed in the second step.

Total number of articles found with search words was only **253**, of which only very few discussed the targeted measurement approaches to an extent that could be used for the further analysis. Consequently we can state, I.) that there is a lack of sustainability measurement tools appropriate for early stages of a new venture that can be found in the data base.

The search criteria was consequently adjusted to increase the number of findings and to include literature without focus on new ventures or startups. Instead, we added “method”, “approach” and “concept” to further focus the search on relevant publications. We conducted a second round of literature collection with the following search words:

*“(Sustain\* OR Economic\* OR Environmental OR Ecologic\* OR Social) AND (Impact OR Value OR Performance) AND (Measure\* OR Report\* OR Account\* OR Evaluat\* OR Benchmark\*) AND (Method OR Approach OR Concept)”*

This time, **124,167** articles were found using the adjusted selection criteria. In order to efficiently process the review, we needed to apply further restrictions for the search, using Web of Science Categories closely related to the field of sustainable entrepreneurship to narrow down the findings: (environmental sciences OR ecology OR engineering environmental OR economics OR environmental studies OR energy fuels OR management OR green sustainable science technology ) resulting in **29,657** entries. It confirms the assumption that the key words are used in various research fields and contexts.

This round of review should focused on identifying those articles clearly introducing or discussing approaches and methods to measure sustainability or one of its domains. Single aspect measurement approaches were excluded since they focus on very specific aspects of on

domain (e.g. waste water as an aspect of ecological impact) and are not seen to contribute to the research question at hand. Assuming that approaches and methods introduced in the past would be cited if seen valuable by the community, we focused on the top-cited publications with more or equal than 100 citations, resulting in a list of **723** publications to be analyzed in the second step literature analysis.

### **Literature analysis**

Selected literature was first grouped during the analysis phase in order to achieve compiled stacks of publications. The grouping was done along the three domains of sustainability, also determining the measurement scope of identified measurement approaches, either being a single domain measurement, measuring primarily all aspects of one sub-domain, namely economic, environmental OR social, or being multi-domain measurement, measuring sustainability across all domains, namely economic, environmental AND social. As stated above, measurement methods focusing on only single aspects of one domain are not taken into consideration for this review.

The following approaches to measure *holistic* sustainability were identified: Many approaches trying to measure holistic sustainability are examples of an integrated accounting or reporting, meaning they cover all three domains of sustainability. The well-known concepts are **Triple Bottom Line Accounting (“TBL”)**, **Global Reporting Initiative (“GRI”)**, **Integrated Reporting (“IR”)** or **Sustainability Reporting (“SR”)**. All these concepts were developed as a reaction to the increasing importance of initial environmental concerns being extended to sustainability later on (Pope et al., 2004). Hence, the assessment approaches focus on supporting decision making in order to determine if an action should be taken or not, taking into consideration all three domains. Additional focus was on integrating sustainability in existing economic reporting, in order to deeply connect each organization with those ideas (Milne and Gray, 2013). Being reporting and accounting principles, these methods do not calculate a single denominator nor do they provide quantitative information in any case.

Figge and Hahn (2004) first described the concept of **Sustainable Value Added (“SVA”)**. Emphasizing the importance of social impact beyond eco-efficiency, trying to develop a measure that truly integrates all three domains of sustainability. It focuses on opportunity costs to determine if resources are used optimally to generate sustainable value added (Figge and Hahn 2004). Although the approach seems promising, the research stream is not further followed by other fellows, resulting in little implementation and examples. One

reason may be, that for benchmarking and opportunity cost determination, respective macro-economic data is needed and the monetarization requires complex conversion (Figge and Hahn 2004). Compared to the former approaches, the SVA allows to determine a single denominator for every domain or even for holistic sustainability.

Approaches focusing on measuring *economic* sustainability: Traditionally economic sustainability was measured by **Balanced Scorecards (“BSC”)**, ensuring that not only one measure, e.g. profit, is on target, but also other key performance indicators are met. The sustainability discussion caused some companies to adapt their BSC to so called sustainability balanced scorecards (Hansen and Schaltegger, 2016), including sustainability indicators, most often single aspect measures. Consequently we cannot really state that multi-domain measurement is observed using the BSC.

**Cost Benefit Analysis (“CBA”)** is widely used for projects and policy assessment (Gasparatos, 2008). It has been adapted to not only determine economic feasibility of a project, but can also monetarize other effects (e.g. environmental) including net present values.

Next, we identified methods to measure *environmental* or *ecological* sustainability: Current research sees the origin of today’s **Ecological Footprint (“EF”)** approach in the 1990s, developed by E. Rees and M. Wackernagel (Gasparatos, 2008). It is seen as a tool and at the same time as a metric, indicating the total area of land and water required to produce a resource, estimating respective consumption of resources and assimilation of waste (Rees and Wackernagel, 1996). Application still happens mainly for geographical areas, e.g. cities and in the last years more often for organizations (Gasparatos, 2008).

The evolving need for companies to reduce greenhouse gas emission was based on political agreements and increasing public awareness. **The Carbon Disclosure Project (“CDP”)** represents the effort to communicate and report carbon disclosure (Kolk et al., 2008). The effort is still voluntarily and so inconsistent across regions and industries, it is criticized because it has never left the reporting stage, and so does not offer proper risk management and decision-making support (Kolk et al., 2008). One reason seems to be the complex calculation and massive data requirement in order to assess the holistic carbon disclosure value, requiring expert resources (Kiernan, 2008).

The approach of **Ecosystem Valuation (“EV”)** has been developed in order to determine the value of goods and services in ecosystems (de Groot et al., 2002). Starting in the 1960s until today researchers aimed to assess the importance of ecosystems for human society. Again, decision-making should be influenced with help of informed valuation. The biggest

challenge is seen in finding matching data and right scaled information required to correctly value these products and services (de Groot et al., 2002).

**Life Cycle Assessment (“LCA”)**, also called life cycle analysis or accounting, is often seen as the most detailed method to define environmental performance, since it considers all stages of a product’s life cycle from required resources to ultimate disposal (Tyteca 1996). It was first mentioned by N. Kirkpatrick in 1992 and developed further in the following decades, still focusing primarily on environmental indicators. Due to the focus on single products or units, it is hard to apply the LCA for entire organizations or ventures, since it requires the summation of all units produced (Tyteca 1996).

**Environmental impact assessment (“EIA”)** has been developed based on the early methods, focusing more on forecasting environmental impact of activities, trying to inform and educate individuals and organizations about their impact on sustainability (Pope et al., 2004).

Last, *social* sustainability impact is measured with the following approaches identified in the selected publications:

The **Social Return of Investment (“SROI”)** approach was initially developed to capture and monetarize the full social impact of the employment services program in San Francisco (Nicholls, 2009). Soon, more and more stakeholders participating in NGOs or social ventures became interested in this method, to assess their social impact. Although named social, it can also contain environmental impacts to some extent. Focusing on the benefiting stakeholders and the respective impact value chain, the SROI compares outcomes or impacts to required input and investments for the stakeholders (Millar and Hall, 2012) (Nicholls, 2009). Advantages are seen in the detailed information collected during the assessment and the net gain for society in monetary terms (Yates and Marra, 2016). Disadvantages are the unevaluated ratios and the complex analysis of several stakeholders and various outcomes. A certain level of subjectivity is also associated to this approach (Nicholls, 2009).

Several slightly different approaches are combined under the name **Social Life Cycle Assessment (“SLCA”)**, all are clearly focusing on social impacts, in order to either compare and benchmark them or to improve the social impact (Jørgensen et al., 2008). Because this research is quite new, most of them are conceptual and currently applied for the first time. Key success factor for this approach is the definition of social impacts, which is less straight forward compared to product LCA and its indicators and impacts (Jørgensen et al., 2008). Additional challenge is the valuation of impacts and consistency across applications.

## Literature synthesis

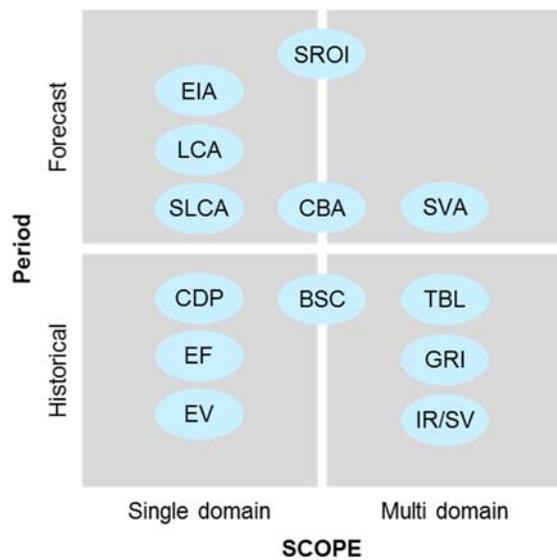
Creating a comprehensive overview on existing methods to measure sustainability and the respective suitability for early stage new ventures to forecast future sustainability is the main goal of the third step in this review. In order to achieve this goal we will introduce simple frameworks, building on the described grouping along the domains and assessing the methods and approaches with help of additional criteria. All introduced criteria will support the final assessment if a method is directly applicable for the question at hand or has only limited applicability. This approach equals a conceptual consolidation of the findings as a first result of the literature review.

First assessment criteria can be derived from the stated definition of sustainable entrepreneurship. The grouping criteria used during the analysis will be used as an assessment criteria, since it determines if a method is capable to cover all domains of sustainability. Hence, we will assess if only one domain is covered or if multiple domains are included in the **measurement scope**, as proposed in the give definition. The measurement approach can also be assessed by the used **measurement period**. It can either be historical data used to create a backward looking value or it can be a forecast, using estimated information to create an outlook which is required to predict sustainability (Gasparatos, 2008).

Current research and use cases show that additional criteria is important. The **measurement focus** will be used to describe if an approach focuses on holistic sustainability determination for an organization including its sold product or if it only focuses on the operational footprint for a given venture. Similarly, we will assess the required **measurement effort** to perform the measurement. Relatively low effort can be achieved by streamlining the measurement with help of delta or gap analysis for example, whereas complex and full data requirements result in more effort. Additionally, the required expertise and resources to maintain and perform the measurement is indicating the required effort (Johnson and Schaltegger, 2015). **Applicability** will be the aggregated assessment criteria.

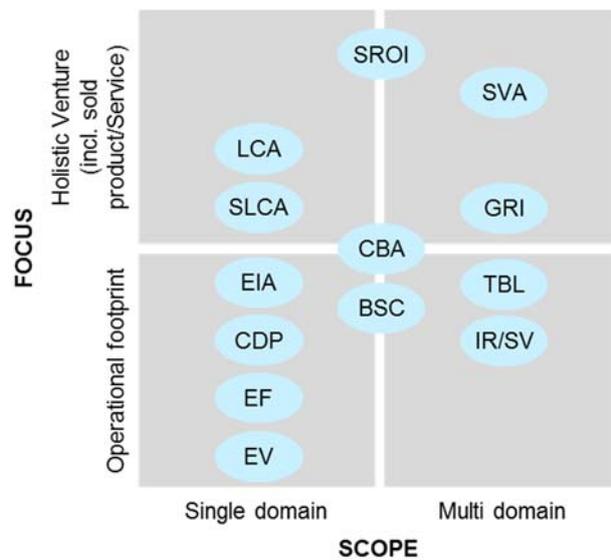
Applying the criteria to all identified methods and approaches allows to visualize them in the above-explained frameworks. First, measurement period is displayed vs. measurement scope (Fig. 1).

**Fig. 1: Framework Scope – Period**



Source: Own figure.

**Fig. 2: Framework Scope - Focus**



Source: Own figure.

Looking at the framework one can state that, II.) holistic measurement tools, covering environmental, social and economic value generation, are needed especially for forecasting sustainability impact. The majority of measurement approaches is focusing on single domains. This shows the challenge to integrate as measurement across all domains, but also identifies potential to holistically measure sustainability. Those methods with broad scope are most likely historical measurements.

Hence, IV.) research needs to integrate initial findings from other studies looking at success factors covering the social and environmental value generation – rather than the economic outcome only in order to ensure knowledge transfer between the domains.

Best fit according to the requirements developed in this review can be stated for SROI, CBA and SVA, since all three methods allow forecasting of holistic sustainability to an extent that is assessed as suitable.

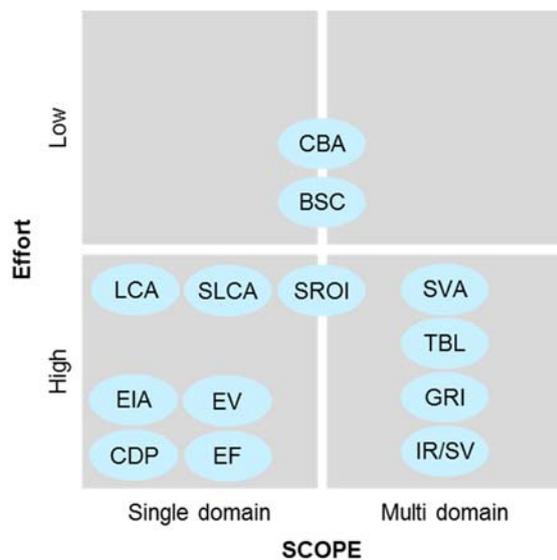
The second framework applied compares measurement focus and scope, determining the overall complexity of an approach, which is required to achieve a holistic measurement of sustainability impact (Fig. 2).

The various methods and approaches do have different measurement focuses. Especially those from the environmental domain, are clearly looking rather at operational footprint, whereas LCAs have a more holistic focus. The GRI contains measures for both product/service and operations, which generates better fit for this criteria. Again the SVA and SROI provide

multi-domain measurement and at the same time holistic focus, as required for the question at hand.

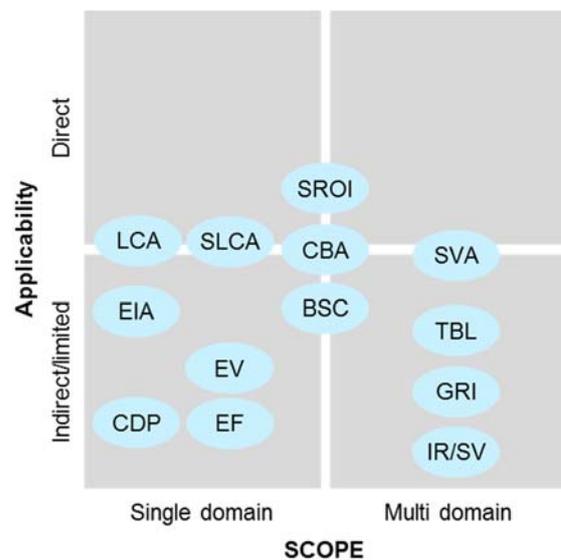
The third framework compares measurement effort and scope, showing the trade-off between broad coverage and resources needed to perform the measurement (Fig. 3).

**Fig. 3: Framework Scope – Effort**



Source: Own figure.

**Fig. 4: Framework Scope - Applicability**



Source: Own figure.

Obviously most of the methods identified create relative high measurement effort, either by being multi-domain approaches or by being very detailed and specify single domain approaches. Most of the times, data requirements, analysis complexity, expert resource requirement and the broad scope create this effort.

CBA and BSC are assessed to generate less effort by focusing on important aspects only and/or using delta and gap analysis. In order to minimize the effort for new ventures forecasting their sustainability impact (due to expected changes and willingness to participate) we propose to III.) focus on the relative improvement of generated value in order to allow a meaningful comparison of different ventures and business models and to significantly reduce the complexity. SROI and SVA could be enhanced by this complexity reduction to better fit the requirements.

If one sums up the single assessments above, the following framework can be generated, indicating the applicability of measurement approaches in the defined context (Fig.4).

Understanding that this qualitative synthesis can only serve as a first orientation point, one can still identify the applicability of certain methods. The former criteria can help to identify adjustments needed to create direct applicability in this context. First, there was no method identified being a multi-domain measurement tool directly applicable, which confirms the relevance of the research question. Next, we can identify SROI and SVA as two methods, which have the best potential to fill the explored gap.

SROI would need to clearly measure holistic sustainability, which could be achieved by integrating outcomes and impacts from all domains. In addition it would improve its applicability if complexity could be reduced, according to the special needs and options of early stage new ventures. Additional research will be needed to define the possibility and to identify those specific adjustments.

Since SVA is not yet fully implemented and analyzed it is hard to estimate the effort required, although it seems to be too complex for early stage forecasting. It clearly offers the potential to integrate all three domains and to apply delta or gap analysis, as seen for CBA.

## **Conclusion**

Although we could not identify an approach to be directly applicable, we can draw relevant conclusions from this review. The literature review reveals that I.) there is a lack of sustainability measurement tools appropriate for early stages of a new venture, II.) that holistic measurement tools, covering environmental, social and economic value generation, are needed and that III.) the relative improvement of generated value needs to be taken into account in order to allow a meaningful comparison of different ventures and business models and significantly reduces the complexity. IV.) Research needs to integrate initial findings from other studies looking at success factors covering the social and environmental value generation – rather than the economic outcome only.

We could identify methods that do better fulfill requirements compared to others and we could identify some methods performing quite well in some dimensions, which allows future transfer to other methods in order to e.g. reduce complexity.

However, there will be adjustments needed to the selected method creating full applicability. The team has decided to continue this path, instead of developing new methods, because it continues existing efforts and allows transition to other methods with venture growth (e.g. shortcut or simplified version for early stages).

Although there are many existing ideas of how to assess sustainability, there remain very few effective examples of implemented sustainability assessment (Pope et. al., 2004). This can be stated even more for the analyzed context of measuring future sustainability for new ventures as shown in this review.

The research findings provide a potential way for measuring, predicting and increasing sustainability impact generated from new ventures. The suggested complements and adjustments are shared for further research and to help establishing the research field of sustainable entrepreneurship. Its application will provide important decision criteria for new ventures (how to increase sustainability), early stage investors (where to invest), policymakers (which types of ventures and business models to support) and sustainability dedicated accelerators (how to support the sustainability generation of new ventures).

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## DO SENIOR ENTREPRENEURS DIFFER FROM YOUTH ENTREPRENEURS? EVIDENCES FROM GLOBAL ENTREPRENEURSHIP MONITOR.

Ján Reháč - Anna Pilková - Zuzana Jančovičová - Marian Holienka

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### Abstract

**Purpose:** Age in entrepreneurship research is one of the key variables which is extensively studied from different perspectives. One of the newest trends in entrepreneurship related to the age of population is “*intergenerational entrepreneurship*”. The key to the success of this concept lies in a thorough research of the differences and similarities between the different age cohorts of entrepreneurs, and their practical application. The aim of this paper is to study key drivers of differences between senior and young entrepreneurs in Europe focusing on opportunity and necessity driven total early stage entrepreneurial activities.

**Design/methodology/approach:** Based on the revision of existing literature and research findings on senior and young entrepreneurs we have formulated the research assumptions that were further tested. The authors focus on relevant differences between senior and young (youth and young adults) entrepreneurs in Europe and validate their coherence through descriptive statistics and regression analysis. The dataset used in this paper is Global Entrepreneurship Monitor data from 2010-2014 in Europe.

**Findings:** Our results confirm areas of significant differences both among studied groups and regions. Some of these findings are in line with general statements presented in literature, but there are also differences in comparison to relevant research studies done on senior and youth entrepreneurship. Our specific focus was also put on analysis of key drivers of TEA necessity and TEA opportunity in studied groups and their differences from regional point of view.

**Research/practical implications:** Intergenerational cooperation is a topical issue which deserves high attention of policy makers on national and international levels. To use this potential and encourage it in right way asks for relevant thorough knowledge of these groups entrepreneurial characteristics. Therefore, our findings have practical implications for European entrepreneurial policies, programs and tools design to boost intergenerational entrepreneurship.

**Originality/value:** Original value of our paper is in formulation of findings based on comprehensive analysis of differences among the youth, youth adult and senior entrepreneurs on European level based on robust GEM data which bring additional value to rare European studies on this subject.

**Keywords:** Intergenerational entrepreneurship, Youth and Senior Entrepreneurship, Global Entrepreneurship Monitor

**JEL Code:** L26, J13, J14

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## **Introduction**

The importance of entrepreneurship in today's economy has been discussed over the past decades on a variety of forums. The impact of entrepreneurial activity, particularly the new business creation, on employment and economic growth are important topics on any government's agenda (Haftendorn and Salzano, 2003). The interest of European governments and policy makers in the last decade has been focused on different types of entrepreneurship and the potential of policies to foster entrepreneurial activity. Number of challenges that entrepreneurial initiatives in Europe face, are connected to underprivileged groups of population such as seniors, young people, women or immigrants (OECD, 2013).

The age as a factor in entrepreneurship research plays a significant role in the context of European countries for variety of reasons, especially due to shift in demographics and the aging of the population, that creates a growing cohort of seniors. Involvement of this cohort in entrepreneurship is found to be a potential measure to alleviate the impact of this change on the economy both from short and long-term perspective (Halabisky, 2012).

On the other hand, the issue of youth unemployment world-wide, and specifically in Europe, has significantly increased in the past decade (ILO, 2015). At the same time, as high as 40% of young people indicate interest in self-employment, however they face difficulties in access to finance, entrepreneurial training or knowledge about government programs (Halabisky, 2012). This leads to a discord between the intention and actual value creation by youth entrepreneurs in the economy, implying the untapped potential (Kourilsky, 2007).

Intergenerational entrepreneurship is one of the trends that evolved from the study of these underprivileged cohorts, as a possibility to combine the untapped potential of these two different groups of individuals, and create programs and policies that help discover synergies and develop the strengths of each of the groups. The knowledge and experience of the seniors in combination with dynamism of the youth in a well-designed collaboration can be the source of entrepreneurial activity that lowers the odds of failure caused by the weaknesses of each of the two groups of potential entrepreneurs. The understanding of the entrepreneurial drivers of these two groups of individuals, and their impact on the propensity of entrepreneurial activity is of major importance in the development of strategies to engage these cohorts in collaborative entrepreneurial activities. The aim of this paper is to study key drivers of differences between senior and young entrepreneurs in Europe focusing on opportunity and necessity driven total early stage entrepreneurial activity.

## **1 Literature review**

The research in the field of inclusive entrepreneurship with respect to age is relatively extensive. Part of the research on senior entrepreneurs revolves around barriers and drivers of entrepreneurial activity in the “third age” (which is usually defined as 50+ or 55-64), whereas one of the main barrier studies focus on is age itself (Hart et al. 2004). At the same time, motivation (or better said lack of the motivation) to start entrepreneurial endeavor is also a recurrent pattern in the study of this age cohort. The lower propensity of seniors to start businesses compared to the general public is attributed to several factors, such as time allocation preferences (Levesque and Minniti, 2006). Drivers for senior entrepreneurship identified by researchers are mainly superior human, social and financial capital (in contrast with the young entrepreneurs). The experience perceived as accumulated human capital has a significant value for an enterprise started by seniors (Botham and Graves, 2009), however the nature of experience is highly relevant, and determines the actual impact on the entrepreneurial activity (Weber and Schaper, 2004). At the same time, the human capital ages, and if not in use, the impact of this experience diminishes (Hart et al. 2004). Social capital in the form of networks is proved to be an important factor across all age categories, but relevant networks (especially in the business environment) can help the older individuals to have better access to advice and potential partners (De Bruin and Firkin, 2001). Financial capital has been found to have diverse effects on the seniors when it comes to entrepreneurial propensity. Accumulated capital provides potential funding for a new venture, however, excess of finance can have a negative effect on the entrepreneurial intention of seniors (Kilber et al. 2011).

When it comes to young entrepreneurs, the focus of the research on the rising unemployment of the youth and the possibility to substitute job creation with self-employment opportunities (Halabisky, 2012) Among the most important issues the young potential entrepreneurs face is the lack of financing opportunities for this age cohort (Minola and Giorgino, 2011, 2014). When it comes to resources, as opposed to older entrepreneurs who have accumulated financial capital and ease of entering the financial markets, young entrepreneurs have neither. Banks are unwilling to lend young entrepreneurs, and there is a lack of programs and tools at their disposal (Minola and Giorgino, 2011). The educational systems and entrepreneurial education as such is one of the key topics when it comes to youth entrepreneurship. Research done by Hytti and O’Gorman (2004) provides evidence that educational systems and policies can either foster or slow down the entrepreneurial intention and engagement in entrepreneurship of young individuals.

Besides the barriers, there are many aspects where young potential entrepreneurs excel, in comparison to their older counterparts. Younger entrepreneurs are more capable in terms of cognitive individual attributes (Minola et al. 2014). The capability to turn the business idea into a functioning business is also higher among the young entrepreneurs (Baker and Nelson, 2005). The levels of energy (dynamism, activity) and sensitivity to new information as well as the capability to process this information as a result are also higher among the young entrepreneurs as compared to the senior cohort (Parker, 2006).

In conclusion, the research in both senior and youth entrepreneurship shows us clear synergies that can be explored. The higher levels of financial capital of seniors, opposed to lack of financial options of young entrepreneurs; the lower energy levels compared to higher dynamism and proactivity; the higher capacity to identify opportunities compared to higher levels of human capital and experience; these are just few of the potential ways to explore the synergies between the young and the old in terms of entrepreneurship. The research of intergenerational entrepreneurship in the last decade has been focused predominantly on the family businesses, and the transition of entrepreneurial intention and knowledge among family members of different generations (Laspita et al. 2012).

## **2 Methodology and Data**

Our analysis is based on Global Entrepreneurship Monitor (GEM) data. It uses two main primary data collection instruments - Adult Population Survey (APS) and National Expert Survey (NES). The APS is annually executed in all participating countries and collects individual-level data through a standardized survey instrument administered to representative samples from adult populations (18 to 64 years old).

We created a pooled sample using GEM APS individual level data for all European countries from four consecutive years 2010 to 2014, with age of respondents as the only selection criterion – 18 – 24 years for the youth, 25 – 34 for the young adults and 55 – 64 for seniors. This resulted to a sample of 216 729 individuals (50 385 for youth, 83 364 for young adults and 82 980 for seniors). This sample contained 2920 youth (18 to 24) early-stage entrepreneurs (out of them 2 238 opportunity-driven and 596 necessity-driven), 7543 young adult early-stage entrepreneurs (out of them 4 668 running their businesses based on opportunity, and 1 429 necessity-based business owner-managers) and 2 691 seniors in early-stage of entrepreneurship (out of them 1 817 opportunity-driven and 726 necessity-driven). The main sample was further divided into six subsamples - three for analyzing the opportunity-

driven entrepreneurship (containing non-entrepreneurs and entrepreneurs out of opportunity) among youth, young adults and seniors and other three for the analysis of necessity-driven activity (comprising of non-entrepreneurs and entrepreneurs starting out of necessity) among youth, young adult and seniors in European countries.

We employed standard GEM variables in our analysis. The dependent variables indicated involvement in opportunity- or necessity-driven early-stage entrepreneurial activity. In GEM, total early-stage entrepreneurial activity (TEA) includes individuals actively involved in setting up a business (nascent) or owning-managing new firms that are less than 3.5 years old (new). TEA individuals are further classified according to the reported dominant reason for involvement in business start-up. Those indicating no better choices for work are considered as necessity-driven entrepreneurs, while those whose reason was mainly/partially to take advantage of business opportunity, or who were seeking for better opportunities than in their recent jobs, are classified as opportunity-based entrepreneurs.

The explanatory variables employed in our analysis include the following: 1) knowing an entrepreneur (knowing personally someone who started a business in recent two years), 2) alertness to opportunities (belief in good opportunities for starting a business in the area where respondent lives in the close future), 3) entrepreneurial self-confidence (belief in having knowledge, skill and experience required to start a new business), 4) fear of failure (having a fear of failure that would prevent respondent from starting a new business), 5) gender, 6) student ("student" indicated as employment status), and 7) household income (total annual household income classified into lowest/middle/upper 33%-tile for each country). Finally, we also included age and proxies for country and year of survey as control variables.

To investigate the entrepreneurship drivers within the populations we applied a binomial logistic regression modelling. This model estimates the probability of an event happening. In our case this event was running an early-stage business activity based on necessity or opportunity. Thus, we conducted twelve regression models analyses with two different dependent variables - opportunity-driven and necessity-driven early-stage entrepreneurial activity. To estimate the parameters of each model we used statistical software R, namely its build-in function for Generalized Linear Models (GLM) which was set on binomial family with logit transformation. The significance of parameters was tested using Wald z-statistics and Maximum likelihood estimations were used to calculate the logit coefficients denoting changes in the log odds of the dependent variable. Correlations between independent variables were tested and proved not to be problematic. The selections of final models were conducted through a stepwise regression function drop1 using Chi-square goodness of fit test, log-likelihood ratio

function and Akaike Information Criterion. The selected final models were then compared to the real observation using Hosmer and Lemeshow goodness of fit (GOF) test, which indicated that the models are well fitted.

### **3 Results and Discussion**

In the first part of the analysis, we aim to explore the *differences in entrepreneurial drivers* from the perspective of entrepreneurship that is based on a *business opportunity*. This type of entrepreneurship is believed to be more innovative, with higher potential of growth and thus impact on job creation and economy. When we look at the results of the analysis (Table 1 - 3), there are various points of interest. In all three studied groups, the most important driver of entrepreneurial behavior is the entrepreneurial self-confidence. Its positive impact on the probability of starting a business in youth and young adults is practically the same. On the other hand, in senior cohort this positive influence is significantly higher. The second strongest driver in all three groups is the network (knowing an entrepreneur). The impact of this variable is mildly stronger in youth compared to young adults and seniors, but the difference is minimal. Even the third strongest driver of entrepreneurial behavior, opportunity recognition (alertness to opportunities), is shared on a similar level of impact in all three cohorts. A significant difference is observable in the impact of income on the propensity of entrepreneurial behavior. The impact of higher household income is significant in all three age groups, but in the group of seniors it increases the probability of starting a business more than two-fold compared to young adults, and is significantly higher compared to youth.

Barriers of entrepreneurial behavior (variables that decrease the probability of starting a new venture) differ among the studied groups. For youth and young individuals, one of the most important factors that inhibit entrepreneurial activity is being a student (strongest impact on youth). Fear of failure is the strongest barrier for seniors to start a new venture based on opportunity, however, the impact of fear on entrepreneurial engagement in seniors is the lowest among the three studied groups. Gender plays an important role as a demographic factor. Impact of gender is strongest among youth cohort, with highest negative impact of being a female on the probability of entrepreneurial activity.

**Table 1: Opportunity based TEA: Model Youth – European countries**

Variable\Estimate\Model	Estimate	Std. Error	z value	Pr(> z )	
<b>(Intercept)</b>	-4.62009	0.20452	-22.590	< 2e-16	***
<b>1. Knowing an Entrepreneur</b>	1.20012	0.06855	17.507	< 2e-16	***
<b>2. Alertness to Opportunities</b>	0.57956	0.06591	8.793	< 2e-16	***
<b>3. Self-Confidence</b>	1.68335	0.07300	23.060	< 2e-16	***
<b>4. Fear of Failure</b>	-0.61814	0.07012	-8.815	< 2e-16	***
<b>5. Gender</b>	-0.58722	0.06878	-8.537	< 2e-16	***
<b>6. Student</b>	-1.05109	0.09425	-11.152	< 2e-16	***
<b>7. Household Income middle</b>	0.16027	0.08629	1.857	0.063254	.
<b>8. Household Income high</b>	0.38545	0.08214	4.693	2.70e-06	***
<b>Observations</b>	20,683				
<b>Hosmer-Lemeshow GOF</b>	0.7931				

Source: GEM 2011-2014, Authors

**Table 2: Opportunity based TEA: Model Young Adults – European countries**

Variable\Estimate\Model	Estimate	Std. Error	z value	Pr(> z )	
<b>(Intercept)</b>	-4.537374	0.157440	-28.820	< 2e-16	***
<b>1. Knowing an Entrepreneur</b>	1.101685	0.049375	22.313	< 2e-16	***
<b>2. Alertness to Opportunities</b>	0.609133	0.046958	12.972	< 2e-16	***
<b>3. Self-Confidence</b>	1.687641	0.060480	27.904	< 2e-16	***
<b>4. Fear of Failure</b>	-0.678306	0.047816	-14.186	< 2e-16	***
<b>5. Gender</b>	-0.368658	0.046363	-7.952	1.84e-15	***
<b>6. Student</b>	-0.807421	0.178782	-4.516	6.30e-06	***
<b>7. Household Income middle</b>	0.055934	0.064188	0.871	0.383533	
<b>8. Household Income high</b>	0.248690	0.061602	4.037	5.41e-05	***
<b>Observations</b>	39,615				
<b>Hosmer-Lemeshow GOF</b>	0.9859				

Source: GEM 2011-2014, Authors

**Table 3: Opportunity based TEA: Model Seniors – European countries**

Variable\Estimate\Model	Estimate	Std. Error	z value	Pr(> z )	
<b>(Intercept)</b>	-6.75819	0.40184	-16.818	< 2e-16	***
<b>1. Knowing an Entrepreneur</b>	1.13438	0.07018	16.164	< 2e-16	***
<b>2. Alertness to Opportunities</b>	0.59431	0.07195	8.260	< 2e-16	***
<b>3. Self-Confidence</b>	1.97038	0.10430	18.892	< 2e-16	***
<b>4. Fear of Failure</b>	-0.52449	0.07973	-6.578	4.76e-11	***
<b>5. Gender</b>	-0.33075	0.07339	-4.507	6.57e-06	***
<b>7. Household Income middle</b>	0.23331	0.10127	2.304	0.021239	*
<b>8. Household Income high</b>	0.53930	0.09442	5.712	1.12e-08	***
<b>Observations</b>	38,038				
<b>Hosmer-Lemeshow GOF</b>	0.7596				

Source: GEM 2011-2014, Authors

*Necessity based entrepreneurship represents an important part of the economy, and in many cases, provides individuals with a self-employment possibility, when no other options are available. This is the reason why necessity based entrepreneurship could represent an important factor when combating unemployment of young people, and low income of seniors in their retirement. The most important driver of necessity-based entrepreneurial activity is the entrepreneurial self-confidence. For youth, the impact of this factor is significantly lower than for young adults and seniors (Table 4 - 6). The impact of knowing an entrepreneur is the second strongest for all three cohorts, with the highest impact on young adults, and lowest impact on seniors. Alertness to opportunities plays a significant role among youth and young adults, however, the its positive impact is small compared to opportunity based entrepreneurs. Being a student has a significant negative impact on entrepreneurship among youth and young adults. Fear of failure has a much lower effect compared to opportunity based entrepreneurs, and is significant in youth and young adults. The probability of being a necessity driven senior or young adult entrepreneur is significantly decreased with higher income.*

**Table 4: Necessity based TEA: Model Youth – European countries**

Variable\Estimate\Model	Estimate	Std. Error	z value	Pr(> z )	
<b>(Intercept)</b>	-4.68988	0.29405	-15.949	< 2e-16	***
<b>1. Knowing an Entrepreneur</b>	0.88048	0.11317	7.780	7.26e-15	***
<b>2. Alertness to Opportunities</b>	0.32798	0.11348	2.890	0.003850	**
<b>3. Self-Confidence</b>	1.15298	0.11927	9.667	< 2e-16	***
<b>4. Fear of Failure</b>	-0.34899	0.11470	-3.043	0.002346	**
<b>5. Gender</b>	-0.41098	0.11355	-3.619	0.000295	***
<b>6. Student</b>	-1.54216	0.19085	-8.080	6.46e-16	***
<b>Observations</b>	19,741				
<b>Hosmer-Lemeshow GOF</b>	0.5641				

Source: GEM 2011-2014, Authors

**Table 5: Necessity based TEA: Model Young Adults – European countries**

Variable\Estimate\Model	Estimate	Std. Error	z value	Pr(> z )	
<b>(Intercept)</b>	-5.05446	0.25862	-19.544	< 2e-16	***
<b>1. Knowing an Entrepreneur</b>	0.97679	0.08183	11.937	< 2e-16	***
<b>2. Alertness to Opportunities</b>	0.29494	0.08164	3.613	0.000303	***
<b>3. Self-Confidence</b>	1.60611	0.10145	15.831	< 2e-16	***
<b>4. Fear of Failure</b>	-0.21139	0.07754	-2.726	0.006404	**
<b>6. Student</b>	-1.08409	0.36099	-3.003	0.002672	**
<b>7. Household Income middle</b>	-0.42938	0.09380	-4.578	4.71e-06	***
<b>8. Household Income high</b>	-0.68871	0.09709	-7.093	1.31e-12	***
<b>Observations</b>	37,815				
<b>Hosmer-Lemeshow GOF</b>	0.7729				

Source: GEM 2011-2014, Authors

**Table 6: Necessity based TEA: Model Seniors – European countries**

Variable\Estimate\Model	Estimate	Std. Error	z value	Pr(> z )	
<b>(Intercept)</b>	-5.44600	0.34162	-15.942	< 2e-16	***
<b>1. Knowing an Entrepreneur</b>	0.67373	0.10399	6.479	9.24e-11	***
<b>3. Self-Confidence</b>	1.68811	0.13128	12.858	< 2e-16	***
<b>5. Gender</b>	-0.42827	0.10728	-3.992	6.55e-05	***
<b>7. Household Income middle</b>	-0.16185	0.12369	-1.309	0.19069	
<b>8. Household Income high</b>	-0.36188	0.12759	-2.836	0.00457	**
<b>Observations</b>	37,455				
<b>Hosmer-Lemeshow GOF</b>	0.9198				

Source: GEM 2011-2014, Authors

## Conclusion

The entrepreneurial activity of young people as well as seniors is a phenomenon of increasing importance. Policy makers are trying to find ways how to increase the incidence of entrepreneurship in these cohorts and academics try to establish research premises to facilitate creation of policies and programs that would achieve such goals. In this article, we looked at the findings of different researchers and based on the conclusions, we analyzed seniors and young individuals in Europe, to find similarities and differences in the drivers and barriers of entrepreneurial behavior. The objective of this research paper was to find potential synergies among the studied groups, that would allow for intergenerational entrepreneurship to flourish.

Our findings show that the major differences between young and old entrepreneurs both in necessity and opportunity driven entrepreneurship, are stronger impact of self-confidence and household income and lower influence of fear of failure and gender on the entrepreneurial activity of seniors, compared to the younger entrepreneurs.

But in conclusion, the drivers for senior entrepreneurship and youth entrepreneurship in Europe are not that different. The most important factor increasing the probability of entrepreneurial activity is entrepreneurial self-confidence. This means that well designed programs that are aimed at intergenerational entrepreneurship skill set can positively influence creation of new ventures.

Second factor that can be generalized and affects all cohorts of entrepreneurs is the entrepreneurial network (or knowing an entrepreneur). This can be linked both to own network and social capital, but also to entrepreneurial role models. Seniors who due to their age possess higher levels of social capital can be linked with their younger counterparts. Reporting of success stories, positive examples and entrepreneurial role models that each cohort can relate

to, is an important task that can help foster entrepreneurial activity. Opportunity alertness is an important factor that positively influences opportunity driven entrepreneurship. Younger individuals can complement the seniors in this task based on the natural cognitive advantage they possess, and create a synergy with well-designed programs that involve both generations.

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## **ORGANIZATIONAL CULTURE OF SMEs IN SERBIA, INFLUENCE OF NATIONAL CULTURE ON ENTREPRENEURIAL LEADERSHIP STYLE AND PHILOSOPHY**

**Dusanka Rodic – Ondrej Jasko – Mladen Cudanov**

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### **Abstract**

**Purpose:** Purpose of this paper is to search for connection between national culture and organisational cultures, especially actual and preferred leadership styles, in SMEs in Serbia, a country with very high “Power Distance” dimension of national culture. Also, national culture influence is compared with globalisation as a way of collective programming. The focus is on the leadership style of the entrepreneurs, the degree of its acceptance among employees and how those styles correspond with national culture.

**Design/methodology/approach:** This study analysis based on Hofstede methodology, using structured data about organizational culture dimensions. Data was collected using on-line questionnaire. Data in the sample consists of fifteen self-selected entrepreneurial SMEs in Serbia where measurement of their culture by the Hofstede methodology was negotiated. Descriptive statistics and cross-case comparisons were used discuss and propose conclusions.

**Findings:** In the research, it is found out that SMEs in Serbia have organizational culture which does not support autocratic leadership style as actual one and that is not desirable one too. This is not the logical consequence under the influence of national culture which score high in two dimensions: Power Distance and Uncertainty Avoidance. The most dominant actual leadership style is consultative and it is also the most desired one. This implies that entrepreneurial orientation and constraints for being competitive in global market shifts the organizational culture into the direction where leadership styles and its acceptance question national culture influence.

**Research/practical implications:** The outcomes are the overview of the dimensions of organizational culture in SMEs research study of 15 entrepreneurial companies. The most interesting outcome is identification of globalization effect on national culture in case of entrepreneurship in SMEs and shows unexpected contradictory of national culture dimension influence on actual and desired entrepreneurial management styles, especially in national cultures which score high in Power- Distance index. This paper can set further hypothesis for a wider research.

**Originality/value:** Contribution is an overview of organizational culture dimensions of SMEs in Serbia with emphasis on management philosophy and actual and desired leadership styles by qualitative analysis of structured data to show the perspective relations between national culture, leadership styles and degree of its acceptance. Limitations of this study are that no true random sample has been used and results cannot be generalized. The fact that companies do not share details about aspects of their business and potential source of competitive advantage, like organizational culture or leadership style to random researchers, this study still provides insight, presenting data hard to gather.

**Keywords:** organizational culture, human resources, SMEs, entrepreneurial leadership style, national culture

**JEL Codes:** M12, M14, L20

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## Introduction

As the subject of this qualitative research belongs to SMEs where owners and executives are entrepreneurs, the main focus is on entrepreneurial management style and question if the management style is under the strong impact of national culture dimensions defined by Hofstede in Serbia, and how these factors look through the prism of institutional theory and impact entrepreneurial leadership style and organizational culture.

The number of companies classified as small and medium-sized (criteria: number of employees) at the end of 2014, according to Republican Bureau of Statistics of Republic of Serbia document, according to industry classification of SMEs, in industry segment defined as professional service (where SMEs from our sample belong) is 1077.<sup>38</sup> The sample in this paper of 15 companies include 1.39% of SMEs of whole population in this industry segment.

Entrepreneurial leadership style analysis comparing to influence of national culture brings into the focus of this research the entrepreneurs, and the need to define them. There are lots of definitions, but for this paper the most accurate is that they are defined as individuals who initiated an entrepreneurial event and started a venture (Gartner, 1985). More specifically, in the sample of this multiple case study entrepreneurs are founder and owners who are directly involved in managing their businesses at the time of the conducting organizational culture survey. To better describe entrepreneurs as owner and managers of SMEs in our multiple case study, it is useful to look at the overview of entrepreneurial postures defined by „is reflected in three types of organizational-level behaviours: top management risk taking with regard to investment decisions and strategic actions in the face of uncertainty; the extensiveness and frequency of product innovation and the related tendency toward technological leadership; and the pioneering nature of the firm as evident in the firm's propensity to aggressively and proactively compete with industry rivals.“ (Covin & Slevin, 1991). On the other hand, the rate or level of entrepreneurship at the societal level depends upon the opportunities provided by the environment as well as the capabilities and preferences of the population. These aspects in turn are influenced by innovation, entrepreneurship and culture, available technology, level of economic development, culture, institutions and the demography of a society (Brown & Ulijn, 2004). All of these aspects, but especially focused on social structures influence which gives the understanding of cultural influence, are framed in concept of Institutional Theory.

Institutional theory is defined as a theory on the deeper and more flexible aspects of social structure considers the processes by which structures, including schemes, rules, norms,

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<sup>38</sup>Source: <http://pod2.stat.gov.rs/ObjavljenePublikacije/G2015/pdf/G201510090.pdf>

and routines, become established as authoritative guidelines for social behaviour. (Scott, 2004). According to (Scott,2004) institutions are defined as social structures composed of cultural-cognitive, normative, and regulative elements which together with associated activities and resources are providing stability and meaning to social life. Institutions are considered to be transmitted by various types of carriers such as are: symbolic systems, relational systems, routines, and artefacts. All those carriers which are transmitters of institutions in institutional theory are at the same time carriers of culture. While analysing organizational cultures and leadership, (Schain, 1990) in his book described culture as group's accumulated learning by adaptation to problems, both in external way by survival, growth and adaptation to their environment and internally by focusing on growth and learning on daily basis. Both of these areas of group functioning will reflect the macro cultural context. There are three different layers of culture (Schein, 1990): artefacts, espoused beliefs and values and basic underlying assumptions.

There are many definitions of culture, but (Hofstede, 1983) defined "culture", in context of national culture, precisely that its essence is collective mental programming: national culture is that part of our conditioning that we share with other members of our nation, region, or group but not with members of other nations, regions, or groups. It influences organizational culture Hofstede sees as a way how members of an organization relate to each other, their work, and the outside world in comparison to other organizations. Our research is focused on first dimension, "The Power Distance index". Hofstede & Hofstede (2001) define it as an extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally. All societies are unequal, but some are more unequal than others. This degree of inequality is measured by the Power Distance scale, which also runs from 0 (small Power Distance) to 100 (large Power Distance), (Hofstede, 1983). Serbia has high index value of 86, which in general results in organizational hierarchy replicating intrinsic inequalities, high authority centralization which is widely accepted by employees who are generally expecting to be told what to do and preferring benevolent autocrat as their superior. Comparing to our research with entrepreneurial SMEs the usual impact which national culture has on organizational culture for this dimension is that typically people in companies in Low Power Distance national cultures prefer consultative leadership style, and organizations in countries with High Power distance index are more prone to accept autocratic leadership style. In this case study analysis of fifteen SMEs owned and run by entrepreneurs in Serbia, considering national culture and high score Power Distance index, this paper shows the real

acceptance of leadership styles and the desired leadership styles, and how it relates in causal relationship with high Power Distance index identified in Serbian national culture.

## **1 Methods**

We have performed research on 15 SMEs, applying content analysis first, and then comparative analysis based on data generated from organizational culture survey report done by Itim international. Organizational culture report consists of structured statistical data for every SME in the sample. Primary data was gathered following Hofstede's methodological approach, supplemented by secondary data - Hofstede National Culture Survey results for Serbia. Comparative research is also done by comparing SMEs organization culture dimensions between sample, leadership style acceptance and leadership style preferences. Cross-case analysis is also conducted, searching for similarities and differences between sample cases, whether within quantitative measures or among qualitative phenomena in organization perceived by the researcher while surveying for organizational culture.

Qualitative research techniques are more applicable to this kind of complex comparative and causal analysis, where social phenomenon and culture issues are included. One of the main general aims of qualitative studies is to explore complex human issues and to provide illumination and understanding of complex psychosocial issues and are most useful for answering humanistic 'why?' and 'how?' questions, which supports the choice of qualitative research approach for this multiple case study (Marshall, 1996). As the qualitative research is naturalistic and requires observations and explanations, qualitative data can be collected and used in conjunction with quantitative data. The beginning point using qualitative methods is simply an interest in observing and asking questions in real-world setting (Patton, 1987). The researcher who analyses data is evaluator in case of qualitative research defined by (Patton, 1987) by using qualitative methods the evaluator strives to understand programs and situations as a whole, searches for the totality - the unifying nature of particular settings, and the advantage of qualitative portrayals as holistic settings is that detailed attention can be given to nuance, setting, interdependencies, complexities and context.

### **1.1 Sample selection**

Empirical background is based on multiple cases, but data for each and every case were collected in the same way through same structured questionnaire and statistically processed by same methods with the same software. The time frame period of collecting this sample of fifteen

companies in Serbia is twenty months. Sample selection was demanding due to multiple criteria defined in advance such as are: to be small and medium enterprise, founded and led by entrepreneur, in similar or preferably same industry segment – professional services, and in group of SMEs which includes inside sub-criteria such as: the number of employees (staff headcounts) and yearly turnover, according to European Commission SMEs criteria definition. Sample selection strategy was based on judgement sample, known also as purposeful sample. It is practically very hard to have truly random sample, due to the defined criteria from one side, and to process of measuring organizational culture and leadership style which includes engagement of 80% of employees and requires time investment measured in weeks, on the other side.

The biased aspect in this sampling could be addressed by specific topic on leadership styles subject in this paper, and participation in survey of autocratic leaders caused by their personality traits and style could be threatening to objective sampling validity, simply because of the assumption that autocratic leaders would not be willing to participate in research due to their style. It could be possible, and some of the companies asked to participate in survey did not accept it, the reasons were many: from lack of time to not seeing benefits of it, but the sincerity and truth of answers could not be checked and validated, just assumed. Many times the owners of company are focused on business imperatives instead on helping random researchers perform their studies, and if there is personal role or position in company dealing with HR issues, usually those are ones who decide about the participation in surveys. Those are challenges to valid non bias sample selection in this research, which make detailed studies about organizational aspects like culture, leadership or strategy biased, even in top management world-wide bestsellers (Peters&Waterman, 1982; Collins 2001).. Because of this challenge, if there were decision of autocratic leaders or their HR managers, we can not claim how much biased (or not biased) is sample selection.

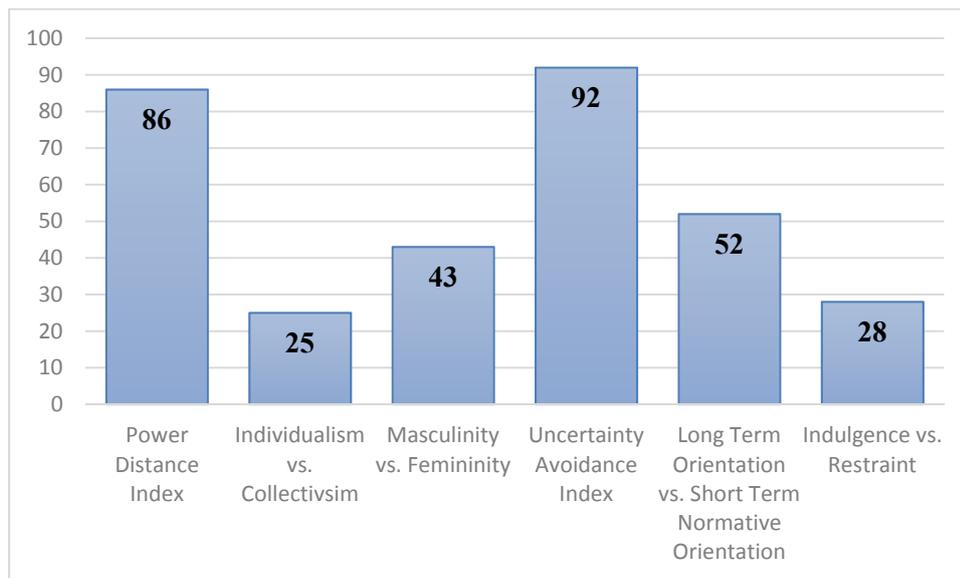
This also lead us to not generalize conclusions for SMEs in Serbia, performing professional services and having management performed by owners.

## **2 Overview of approaches and tools used for comparative and cross-case analysis**

In this paper, we have used eight dimensions of Hofstede's Multi Focus model: D1 – Means-oriented vs. Goal-oriented; D2 – Internally vs. Externally driven; D3 – Easygoing work discipline vs. Strict work discipline; D4 – Local vs. Professional; D5 – Open system vs. Closed

system; D6 – Employee-oriented vs. Work-oriented. Our research focuses mostly on dimension D7 – Degree of acceptance of leadership style (i.e. is actual leadership style aligned with employee preferences) and partly on D8 - Degree of identification (of employees) with the organization (i.e. do employees feel strongly connected with organizational aims and goals). We have compared eight organizational dimensions with Serbian national culture survey based on Hofstede 6-D Model©, presented below in Fig 1.

**Fig. 1: National culture survey, country: Serbia , 6-D Model©**



Source: Author's drawing based on data of Geert Hofstede, *Dimensions of national cultures* [ONLINE] Available at: <https://geert-hofstede.com/serbia.html> [Accessed 27 March 17].

### 3 Findings

#### 3.1 Overview of organizational culture dimensions' findings

First variable we have focused on, D7 – Degree of acceptance of leadership style, had the average score of actual acceptance 50.8 and the average value of maximum acceptance is 59.8 which leaves quite a small gap in our sample. This variable shows to which degree different percentages of employees have manager which they prefer. This is calculated in practice by asking employees how they are managed and how they prefer (desire) to be managed. Only employees who expressed by their answers that they are managed the way they like to be managed will contribute to an increase of the actual score on D7. Variable D8 - Degree of identification (of employees) with the organization has the average value of 55,53. The lower the score is, the more employees tend to leave the company. We observe similar trends and correlation between measured D7 and D8 on one side and D6 (Employee-oriented vs. Work-

oriented) on another, pointing to assumption that employee oriented management philosophy is in direct correlation with acceptance of leadership style and motivation to stay in company.

In the Tab.1 dimension D7 is presented in detailed way, with all the styles which were given to respondents to the culture questionnaire.

**Tab. 1: Overview of actual and desired Leadership styles**

Leadership styles (actual and desired) in %										
Company	1		2		3		4		5	
	Autocratic		Paternalistic		Consultative		Democratic		Other	
	Actual	Desired	Actual	Desired	Actual	Desired	Actual	Desired	Actual	Desired
SME1	8	0	38	31	46	38	8	31	0	0
SME2	17	0	17	17	50	50	17	33	0	0
SME3	0	0	43	0	29	86	29	14	0	0
SME4	13	0	13	13	38	75	13	13	25	0
SME5	40	20	20	20	30	40	10	20	0	0
SME6	60	0	0	20	20	20	0	60	20	0
SME7	0	0	40	20	40	60	20	20	0	0
SME8	20	20	20	40	60	40	0	0	0	0
SME9	0	0	0	0	80	80	0	20	20	0
SME10	0	0	40	80	40	0	0	20	20	0
SME11	60	20	0	40	20	0	20	40	0	0
SME12	0	0	43	86	43	0	0	14	14	0
SME13	0	20	40	60	0	20	0	0	60	0
SME14	0	0	20	20	40	60	40	20	0	0
SME15	14	14	43	0	14	43	29	43	0	0
Means	15.466667	6.266667	25.133333	29.8	36.666667	40.8	12.4	23.2	10.6	0

Findings from Table 1 results:

- The average percentage of presence of Autocratic leadership style is low – 15.46 %, and in 7 out of 15 companies is not present at all.
- 33.33% of companies desire some amount of Autocratic leadership style - 5 out of 15 SMEs.
- The percentage of desire for Autocratic leadership style is very low - average score on whole sample is 6.26 %, and in 10 SMEs (out of 15) is not desired at all.
- Just one SME15 – the amount of actual and desired level of Autocratic style matches (14 -14).
- The average acceptance of actual of Paternalistic leadership style is 25.13 %
- Paternalistic leadership style is desired in 12 companies and in 3 companies matches with the amount of actual present Paternalistic leadership style
- 80% of companies in sample desire some amount of Paternalistic leadership style

- Consultative actual leadership style is the dominant actual style in companies, and average score is 36.66, which is the highest among styles
- 80% of companies desire some amount of Consultative leadership style, and actual and desired amount of this style almost match
- Democratic leadership style is least present actual style with average score in sample – 12.4 %
- 86.67 % of companies desire some amount of Democratic leadership style, and the biggest discrepancy between actual and desired is in case of Democratic style, where the discrepancy is 10.8 in direction of increasing Democratic style in SMEs in Serbia.

If we look deeper into data, SME9 and SME14 scored high in D6 (respectively 8 and 15 on a scale 0-100 where smaller values mean employee oriented and larger mean work-oriented), indicating very employee oriented management philosophy, has the high acceptance of actual leadership style and has high employee motivation to stay in the company, and when we look at those two examples in context of leadership styles, we can see that none of them has present nor desired Autocratic leadership style at all.

## **Conclusion**

Researchers in the field of culture, including Hofstede have hypothesized that entrepreneurship is facilitated by cultures that are: high in individualism, low in uncertainty avoidance, low in power-distance, and high in masculinity (Hayton, George & Zahra, 2002). As we can see in Serbian national culture, we have the opposite of what is culture which facilitate entrepreneurship. High in power distance -86, high in uncertainty avoidance – 92, relatively low in masculinity -46 and low in individualism -25. All the dimensions of national culture together do not support entrepreneurial culture. That means according to institutional theory which is concerned with regulatory, social, and cultural influences that promote survival and legitimacy of an organization (Bruton, 2010), that institutions which guide behaviour of members of society by rules, actions, monitoring, and enforcement (North, 1990). These regulative components, with the cultural factor of high uncertainty avoidance and thus society's emotional need for so many rules, the composition of all of social structures together could influence a society's legal system (Hofstede & Hofstede, 2001). Society's legal system plays huge role in encouraging entrepreneurial activities or limiting them. Today, SMEs are faced with an increasingly challenging external environment, requiring innovation (Milutinovic, Stosic & Mihic, 2015) due to rapid technological evolution, globalization, and progressively

sophisticated competitors (Kim, 2016). These findings could contribute as an argument, to our findings that organizational culture in specific industries SMEs in Serbia is not under the direct causal influence of national culture dimensions. As we could see in organizational culture dimensions in our multiple case study analysis, most of the dimensions are aligned with entrepreneurial traits and characteristic of entrepreneurial companies. They are goal oriented, mostly customer oriented, and externally driven, their focus is mostly professional and they are open systems where management philosophy is mostly employee oriented. The scores on some of dimensions could be higher, but still this multiple case study shows us that despite the national culture in Serbia does not support entrepreneurship orientation in any single dimension, in SMEs in Serbia entrepreneurial culture is dominant.

Other findings about specific national culture dimensions' direct influence - high power distance (where subordinates expect to be told what to do, where the government is autocratic) and uncertainty avoidance (where there is collective emotional need for rules) on leadership style of entrepreneurs who are managers and owner of SMEs in our sample, supports the fact that autocratic leadership style is not dominant style at all. Autocratic style is not even desired style. The most actual present leadership style in Serbian SMEs is consultative style. Consultative style gives the freedom for opinions in the companies and creates preconditions for shifting to democratic leadership style in the future and foster important phenomenon of taking the responsibilities by employees, which leads to the shift in culture, both organizational and collective- national. These findings are interesting and foster new light on institutional theory and impact of institutions, even societal factors on entrepreneurship, and rises a question why. Is the impact of globalization stronger than impact of national culture or these cases of SMEs found some niche between institutionalized norms and laws, non-formal rules and culture impact?

This data presents limited insight into aspects of culture and leadership style due to the self-selection bias and limitations discussed earlier. It was gathered in the period of twenty months as each company culture profile and leadership style was separately evaluated in a project lasting few weeks using Hofstede's methodological approach. However, these findings give strong direction for further research on a bigger sample in Serbia, where in timespan of several years culture and leadership style in wider, less biased sample would be evaluated. It would be valuable for further research to conduct it in countries with similar scores in cultural dimensions, at least with Power Distance index when it comes to the leadership styles of entrepreneurs of SMEs, for example in Slovakia (score 100 in PD index).

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## THE ECONOMIC CONSEQUENCES OF STUDENTS INFLOW FOR LOCAL ENTERPRISES

**Diana Rokita-Poskart**

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### **Abstract**

**Purpose:** The aim of the article is to present the mechanism via which educational migration related to undertaking higher education can influence on local good and service market, labour market and entrepreneurship.

**Design/methodology/approach:** The economic consequences of student inflow have been shown for one of the academic cities in Poland – Opole which has one of the highest student-to-inhabitant ratios and approx. 90% of students are internal educational migrants. The analysis has been based on the results of empirical research conducted among educational migrants of all universities in Opole selected based on quota sampling. The complementary to the presented data were the correlation analysis and the result of the research conducted in 2016 among the local enterprises which concern their opinion about the impact of incoming students on their companies.

**Findings:** The results and estimates presented in this study shows that educational migrations related to tertiary education may create substantial economic benefits for the academic city. This study paid particular attention to benefits for local market of goods and services, the local labour and thanks that mechanism on local enterprises in an academic city.

**Research/practical implications:** The results of the research and the estimates can be used by local authorities of academic city for awareness of the importance of students' inflow for local economy. The diagnosis can be used in design scenarios for improving the demographic and economic situation of the academic city.

**Originality/value:** The impact of the inflow of student of local economy of academic city, especially their economic consequences for the area of the internal inflow are a research problem almost absent in the scientific discourse.

**Keywords:** educational migration, inflow of students, local economy, local enterprises

**JEL Codes:** O15, J21, J23

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## Introduction

*“I not only use all the brains that I have, but all that I can borrow”*

Woodrow T. Wilson

Academic cities, in which universities are located, may benefit many economic profits from the academic functions (Florida, Cohen 1999). Except of numerous significant consequences created by the higher education institutions and related to their influence on development of human capital (Berry, Gleaser 2005, Abel, Deitz 2009), their knowledge-based investments in the economy development or contributing to knowledge transmission and occurring of new innovations (Florida 1995), students are those ones who influence the local economy of academic city (Smith 2002, Čorejová, Rostášová 2015). Since universities are located in cities, then these institutions can attract to the particular city students who generate, by the fact of their presence and their participation in various activities, many positive aspects for local economy (Steinacker 2005). Students influence the academic city in multi-track ways undoubtedly, still it is clearly seen that the economic benefits are of the highest importance for the city. On the one side, dynamic growth of local goods and service market may be the consequence of the students' presence in the academic cities and their consumption expenditure. On the other side the local labour market derives benefits from students' presence and their engagement in work in the local academic centre – along with student' inflow to the cities the labour stock grows (Munro, Livingston, Turok 2009). Students inflow and additional, generated by them boost demand, positively influences the labour demand and is perceived as a trigger to create additional work places in the local economy (Steinacker 2005). It could be assumed that market mechanisms mentioned and discussed above explain students influence on academic centres – e.g. not only on goods and services market, but on labour market as well. As a result, students can influence the functioning and developing of many local enterprises in the academic cities.

The main aim of this paper is to picture the channels via which non-resident students may influence on the academic city economy – local goods and services market, local labour market and above all on local entrepreneurship. For this purpose, there were used a monographic method based on the characteristics of the data obtained as a result of empirical research. Obtained data made difficult to capture the statistical impact on the analysed phenomenon, and therefore the application of sophisticated statistical methods has been abandoned. However, the analysed consequences were defined on the basis of the conducted analysis and the percentage comparison of the research results with the data calculated based

of public statistics. Additionally, there were also used the Pearson's correlation and qualitative data analysis.

Analysed consequences were presented on the example of one of the academic cities in Poland – Opole – the capital of the smallest voivodship in terms of the number of inhabitants and the area. Five higher education institutions located in the city have attracted approximately 25 000 students, majority of them are the non-resident students (90%) – called educational migrants. It might be seen that number of students who study in Opole is not impressive, but after analysing indicator of students' number per residents' number, it turns out that Opole is on the first place out of all voivodship and non-metropolitan cities in Poland. The value of this indicator (0,19) suggests that the students impact, in particular educational migrants, on the situation in Opole academic centre is quite high (Rokita-Poskart 2016). To examine the influence of students on the economy of academic centre there were conducted research which some results have been presented in this paper. The research was conducted between 2013-2015 among sample of 967 educational migrants of the last year of studies at all higher education institutions located in Opole. During the sample selection two main parameters were taken under consideration – participation of men and women and participation of students of full-time studies and part-time studies of all students of higher education in Opole according to Central Statistical Office. Additionally, during the sample selection an effort was undertaken to include participation of specific subgroups of field of studies according to International Standard Classification of Education and participation of first and second – cycle studies students out of all students of higher education in Opole. The choice of parameters was made on the basis of observations made during pilot surveys conducted between 2011-2012.

The most important, from the point of view of the purpose of research, were questions concerning amount and structure of expenditure of students in the academic city and their employment – such as characteristic, position and salary. Answers to these questions have not only allowed to estimate value of consumer demand created by students' inflow to the city which is being treated as a part of local enterprises revenues, but they have also helped to estimate numbers of workplaces, which were being created in the local economy due to students' expenses. Answers concerning character of students' work were helpful while an attempt was taken to define the consequences involved by students on the local labour market. Estimations and arrangements conducted on the basis of survey results allowed to take under consideration channel via which non-resident students can influence on local business.

It is worth to mention that there were complementary surveys to those described above - qualitative surveys conducted with the in-depth interview technic among several business

functioning in the environment of academies and students' campus. This survey main aim was to comprehend the local entrepreneurs' opinion on the students influence on their business.

## **1 Research results on the economic consequences of student inflow for local market of goods, services, labour and entrepreneurs of academic city**

Economic consequences resulting from students' inflow are noticeable on the local commodity and service market of academic city. It is directly connected with the growth of consumer numbers who boost the consumer's demand and, at the same time, determine revenues of enterprises – most of all those, which offer targeted goods and services at the particular group of consumers – students.

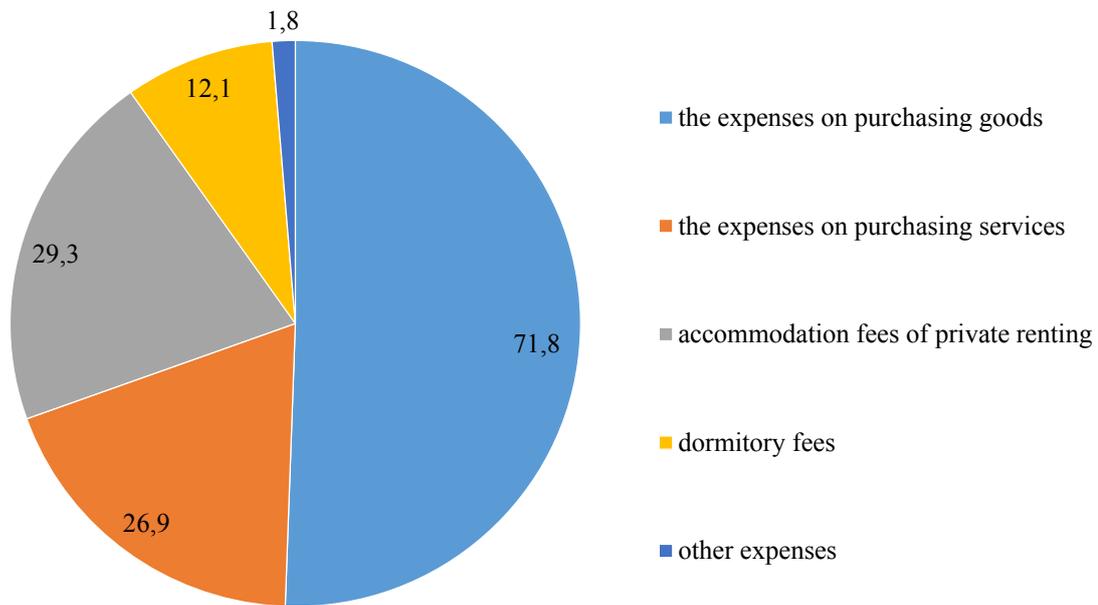
Results of survey conducted in Opole, proved that on average student through the whole academic year, which lasts usually 9 months, spends 6 345 PLN (1 518 €<sup>39</sup>) in the city. Assuming that 90% of 25 000 students in Opole are non-residents, circumscribed as well as educational migrants, it could mean that during the whole academic year they would probably spend in the academic city approximately 142mln PLN (ca. 34mln €). This amount can constitute approx. 15% of the total expenses of Opole residents, what may assume that this additional demand have determined the commodity and service market and local enterprises<sup>40</sup>. From the point of taking an attempt to define the mechanism via which students' expenses influence on the development of local enterprises, it seems that beside of indicating value of additional demand in the academic city, the structure of educational migrants expenses is essential – data is presented in the figure 1.

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<sup>39</sup> Calculations were made basing on average annual exchange rates of Euro in relations to PLN in 2015 – 4,18 PLN/ Euro according to National Bank of Poland

<sup>40</sup> Due to the lack of precise data, own estimation was made based on statistical data and assumption.

**Fig. 1: Structure of educational migrants expenses in Opole (mln PLN)**



**Source: own elaboration based on own research**

Out of all students' expenses in Opole which were at level of 142mln PLN in 2015, it is worth to underline importance of two indicated expenses – amount of students expenses on goods purchases and amount of expenses on services purchases. Those two groups are extremely significant in creating additional revenue among the local enterprises. Other, presented in the figure 1., groups of expenses are not directly connected with local enterprises<sup>41</sup>.

Calculations presented in the figure 1. indicate that approximately 98,7mln PLN (ca. 24mln €) flow directly to local business as the expenses on purchasing goods or purchasing services. As it results from the survey, non-resident students spend approximately 71,8mln PLN (ca. 17,2mln €) a year on purchasing goods, which turn into additional revenues for local trading company which offer groceries and clothing or income of petrol station. What is more, as the mentioned-before calculations indicate, students spend during the whole academic year around 26,9mln PLN (6,4mln €) in the enterprises which provide various services – for instance catering, recreation, photocopying services, transport, etc., contributing to accelerate revenues of those companies. Mentioned before calculations allowed to assume, that students inflow and the fact of their consumer spending in the academic city have stimulated many companies in the local market, especially influence the functioning and development of those, located in the

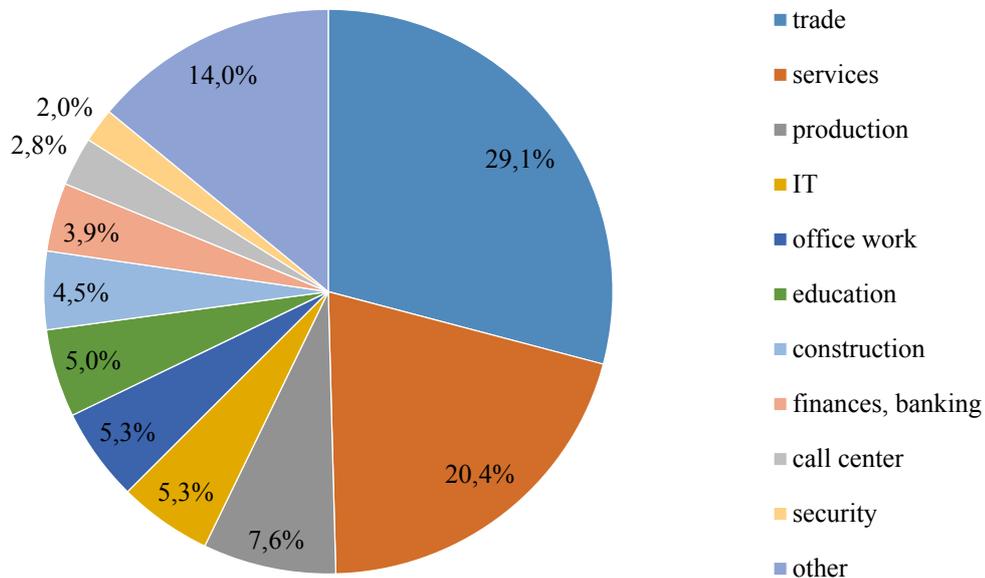
<sup>41</sup> It is worth to notice that charges for renting accommodation, which are major income of households and charges for halls of residence which are property of universities and are part of universities income, were omitted

close proximity of university campus or those with students as the major group of their consumers.

It is worth to underline that fees, which were omitted in the earlier analysis, paid by students and related to renting accommodation from the private rented sector, could have an indirect influence on the local business (fig. 1). The income of households in Opole, which are renting accommodation for students, is calculated approximately at the level of 29,3mln PLN (ca. 7mln €), which is believed to be spent at the local market and thanks to this consumer demand have been stimulated local enterprises.

The local labour market of the city is one of the channels through which non-resident students influence local enterprises. It is proved that some students, except of being involved in educational activity, decide to become involved in all various work activities, having an impact on the growth of work supply and increase of labour resources availability for local entrepreneurs. In city such as Opole, which is facing many demographical issues resulting from the depopulation and migration towards capital of neighbouring voivodships and almost common issue of working abroad, many entrepreneurs have pointed out with the problems with finding employees for vacant positions (Kubiciel – Łodzińska 2012). To some degree the cure for mentioned before issues could become the inflow of several dozen students to the city, who, as the research results show, in major (ca. 26% - 5 600 students) declare the fact of working at the academic city, mostly in the temporary mode. Owing to the fact, that the number of working migrants constitute about 7% of total number of Opole workforce, it could be assumed, that in many enterprises non-resident students could replace local workers while the enterprises are claiming labour shortages. This gives the entrepreneurs the access to unskilled workers, which are characterized as flexible and, as the surveys show, with no high financial expectations. This characteristic can be proved by the results of research on trades in which non-resident student were working – mainly merchant enterprises and those with gastronomic and hotel services (fig. 2). These enterprises usually look for low-skilled workers with no high financial expectations, who can work at nonstandard hours, for instance late hours or weekends shifts. Access to this group of workers usually helps the enterprises to accelerate their economic activity.

**Fig. 2: Work of non-resident students in Opole academic city.**



Source: own elaboration based on own research

An increase in access to workers could be even more crucial, because they have crucial impact on boosting local consumer's demand which affecting growing revenues of enterprises. This could lead among entrepreneurs to labour demand growth which, as it could be assumed, would not be met by the local work supplies. This issue is being solved by students who can meet higher needs of entrepreneurs.

The confirmation of the results presented above may also be the correlation analysis between the number of students in Opole and the number of commercial and service enterprises classified in sections I and G of Polish Classification of Activity in the period 2009-2016<sup>42</sup>. The correlation was estimated based on the following formula:

$$r(x, y) = \frac{cov(x, y)}{\sigma_x \times \sigma_y}$$

where:

$x$  – the number of students in Opole

$y$  – the number of enterprises in Opole in section I (trade) and G (gastronomic and accommodation services) according to Polish Classification of Activity

$cov(x, y)$  – covariance between  $x$  and  $y$

<sup>42</sup> This two section were selected due to the fact that the result of the research showed that those type of enterprises benefits from the students presence in the city.

$\sigma$  – standard deviation in the sample

This coefficient for the analysed data amounted to 0.94 may confirm that the number of students can have relationship with the number of those enterprises for which the target group are students – mostly commercial and service enterprises.

Indicated mechanism of students boost the local enterprises is being proved by in-depth interviews conducted among entrepreneurs. In their opinions students are substantial group of customers and their spending have noticeable impact on the higher level of income through sale. Depending on the character of business and its location e.g. in the close proximity of university campus, entrepreneurs estimate that students' expenses generate ca. 40-50% of their revenues. Furthermore, they indicate that during summer season it is being easily observable an absence of group of several dozen consumers which lead to worse financial results of enterprises. Local entrepreneurs indicated that they hire students willingly, who, to some point meet shortage of local work resources. They relatively often claimed that an access to the group of potential workers let them develop their business. Entrepreneurs answers confirmed the supposition, that they hire students because of their flexibility and thanks to this attribute there is the possibility to fit the size of employment to enterprise's needs. There was one argument who was repeated often during interviews – students who do not have high financial expectations, are cheaper alternative to the traditional work supplies in the city.

## **Conclusion**

New users of academic cities – non-resident students, lead to many social, cultural, urban and economic consequences. On the one hand, student may have negative impact on academic cities. At this point, it is worth mentioning that the inflow of student can lead to consequences connected with the process of studentification such as changes in urban landscapes, housing market with the replacement and displacement of established residents and changes in relation among members of local communities (Smith 2002). On the other hand, there are many benefits of students in academic cities as they can create consequences on local economy of academic city: on the local goods and services market, on the labour market, and through this on functioning of local enterprises in academic cities. The analysis presented in this paper, show that the influx of students may lead to benefits for local enterprises. However, questionable is whether students' inflow to academic cities influences the same way all enterprises on the local market. It could be assumed that in much higher-level students influence functioning of local enterprises, which are selling goods and provide services dedicated for students, such as small

shops, pubs, canteen, stores located in the close neighbourhood of university campus, whilst in lower level influence business, where students are not the most important group of customers. Although it is worth to underline that through multiplier effect, all enterprises could profit from the location in the academic city as well as the local labour market.

Mechanisms, indicated in this paper concern short-term analysis. It seems that in the context of creating the basis of long-term development, one more aspect of students' inflow and their presence in the academic city is also significant – it is important for academic cities not only to attract students, but also to simultaneously create and prepare strong environment for retaining students after graduation. Results of many research, also that which have been conducted in Opole, show that the availability of jobs is the most crucial factors influencing students' retention. Therefore, the most important part in local development policy should be paid in attracting the large companies which offer the satisfying jobs for graduated students. In the context of long-term development this part of the public policy issue may encourage students to retain in the city after graduation, to implement procreation plans, consumer spending, investments and to pay taxes. As Richard Florida claims, cities develop mainly because talented people want to live in those cities (Florida 2005). This mechanism could be compared to flywheel of local economy – in some academic cities „core creative class” creates basis of local entrepreneurship mainly, because the inflow of talented people attracts to city new enterprises and leads to the development of other business – undoubtedly all are considered as important constituents of local and regional development (Hawrysz, Foltys 2016).

The other dimension of long-term students' inflow on entrepreneurship development is their involvement in starting their own business in the academic city (Eesley, Miller 2012). In such context, academic city authorities should not only create foundations to make graduates stay, live and work in academic city, but also encourage them to start business in the city. This issue is important enough to continue further specific and deepened analysis<sup>43</sup>.

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<sup>43</sup> It should be noted that research concerning tendency of economic studies students to start their business are being conducted in the Opole academic center, unfortunately until finishing presented paper, study results were not described.

conducted under the auspices of President of Opole. I would also like to thank the anonymous reviewers for their helpful and constructive comments.

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## CRITICAL EVALUATION OF CZECH MUNICIPAL SPENDING PREDICTIVE MODELS

Pavel Rousek

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### Abstract

**Purpose:** The aim of the paper is detailed knowledge of factors that affect the volume and structure of municipal expenditures, based on research of budgetary expenditures of 6258 Czech municipalities. The sustainability of the public sector is not yet widely discussed in the professional public. As the Guthrie & Farneti (2008) study shows, the first area has been voluntary reporting in Australia.

**Design/methodology/approach:** The sample used for basic results are 6258 Czech municipalities and their budgets. The data sources are three systems of Ministry of Finance of the Czech Republic – ARIS, ÚFIS, and MONITOR. The analyzed predictive model assumes constant grow rate. The analysis is based on the generated time series of the municipal budgets.

**Findings:** Some factors have a greater impact on public budget size; the impact of other factors is primarily structural. Analyzed predictive model with constant growth rate doesn't allow a satisfactory estimation of future values. General predictions based on this model could be used in the economic growth; it is not applicable in times of economic crisis. This issue could be fixed by adding more parameters of the prediction like GDP.

**Research/practical implications:** The entire thematic framework is illustrated by case studies, which are based on 3 municipal budgets. Attention is paid especially to big cities with the largest budgets, municipalities with financial problems (bad practice) and municipalities with healthy financing (best practice).

**Originality/value:** Several theoretical publications are dedicated to this area. However, there are almost no studies on real data. For example, Ochrana and Pavel deal with an analogical issue in Czech conditions. This is the opportunity for future cooperation.

**Keywords:** Municipal Budget, Municipal Spending, Spending Volume, Spending Structure

**JEL Codes:** E60, H40

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## Introduction

The paper analyses the volume and structure of budgetary expenditures of municipalities in the Czech Republic. The aim of the research is detailed knowledge of factors that affect the volume and structure of municipal expenditures, allowing the better future planning.

The paper is based on the generated time series of the municipal budgets since 2000. Raw data are recalculated, discounted and compared across time and space. The sample used for basic results are all Czech municipalities, which means 6258 municipalities. Case studies are based on specific municipal budgets.

Big cities with the largest budgets are represented by Czech capital Prague in case studies. Municipalities with funding problem are represented by Bublava. And finally, municipalities with the smooth funding are represented by Modrava. These case studies are all necessary for accurate future planning and for examples of best practice and bad practice.

## 1 Data and methods

Necessary **data** for the analyses below are the expenditures of all 6258 municipalities in the Czech Republic on selected local services (local roads, wastewater treatment, public lighting, cemetery care, municipal waste and greenery care), total budgets of Czech municipalities and macroeconomic data (especially GDP). The basic data sources are three systems of Ministry of Finance of the Czech Republic – ARIS<sup>44</sup> containing data from the years 2000-2009, ÚFIS<sup>45</sup> containing data from the years 2010-2012 and MONITOR<sup>46</sup> containing data from the years 2010-2016.

The **analysis**, its tools, and methods are focused on six selected public services with delivery on the municipal level in the Czech Republic: Local roads, wastewater treatment, public lighting, cemetery care, municipal waste and greenery care. All these municipal services have a huge potential for use of information technology in the smart city concept.

These public services use different size and structure of financial resources. Some services are cheap (e.g. cemetery care), some are costly (e.g. local roads), sometimes investments are costlier than operation (e.g. wastewater treatment), sometimes an operation is costlier than investments (e.g. municipal waste). Public sector and public administration is currently an opportunity to involve modern management systems and innovation management.

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<sup>44</sup> Ministry of Finance of the Czech Republic. ARISweb – domovská stránka. <http://wwwinfo.mfcr.cz/aris/>

<sup>45</sup> Ministry of Finance of the Czech Republic. ÚFIS – domovská stránka. <http://wwwinfo.mfcr.cz/ufis/>

<sup>46</sup> Ministry of Finance of the Czech Republic. MONITOR – informační portál. <http://monitor.statnipokladna.cz/>

Expenditure prediction is important for planning of future activities. There are two basic predictive models. The predictive model published by Rousek (2011) has following (1) parameters:

$$Exp^e = Exp^{aut} \times i^{y-2001} \quad (1)$$

- Exp<sup>e</sup> – Expenditures expected in year (y)
- Exp<sup>aut</sup> – Autonomous expenditure component
- i – Growth rate chain index
- y – Year

Expenditures expected in a particular year are determined by autonomous expenditure component and by the growth rate of these expenditures. Current expenditures and capital expenditures are analyzed separately with its own autonomous component and growth rate. These parameters for each type of expenditures are shown in table 1. Source data in constant prices of 2010 was recalculated to constant prices of 2015.

**Tab. 1: Predictive model for the Czech Republic (CZK mil.)**

		Local roads	Wastewater treatment	Public lighting	Cemetery care	Municipal waste	Greenery care
Current exp.	Exp <sup>aut</sup>	8 636	789	2 714	453	4 261	3 688
	i	1.03621	1.06382	1.02850	1.04053	1.07300	1.05524
Capital exp.	Exp <sup>aut</sup>	10 470	8 368	558	241	82	550
	i	1.08192	1.03505	1.01499	1.01615	1.17113	1.15120

Source: Authors calculations, Data: Rousek (2011).

The data set can predict, for example, capital expenditures for local roads in 2015. This example (2) estimates expenditure level of 31 526 million Czech crowns (3).

$$Exp^e = 10470 \times 1.08192^{2015-2001} \quad (2)$$

$$Exp^e = 31526 \quad (3)$$

The alternative model is based on GDP development. This paper proves the accuracy and applicability of these two predictive models. Tool to verify this is a calculation of correlation between predicted values and actual values. If one of the models appears to be applicable, the correlation will be extended by regression and future developments expected.

## 2 Hypothesis

*H0*: The predictive model based on autonomous expenditure and constant growth rate allows a satisfactory estimation of future development of municipal expenditures of six selected public services.

*H1*: The predictive model based on autonomous expenditure and constant growth rate doesn't allow a satisfactory estimation of future development of municipal expenditures of six selected public services.

## 3 Economic analysis

There are several parts in the following chapter. First, there are analyzed summaries of expenditures of Czech municipalities in terms of time series, the total amount and the internal structure. The aim is to verify the suitability of prediction methods.

Three examples of case studies were used to create this paper. The choice of subjects was based on the principle of high diversity of defined parameters. Large municipalities are represented by the capital city of Prague. Municipalities with financial problems are represented by the municipality Bublava. Municipalities with good financial conditions are represented by the municipality Modrava. There are several analyses of Prague, Bublava and Modrava budgets in terms of time series, the total amount and the internal structure. In this section, there is also a comparison with the national trend and analysis of predictive methods.

There is an evaluation of **general predictive model** and comparison of predicted data with real data. Table 2 contains individual correlations of the predictive model. Unfortunately, there are some data not available (N/A) because the model calculated just partial cost items individually and not the total sum. However, total expenditures are important, so the total sum was additionally added to these analyzes.

**Tab. 2: Individual correlations characterizing partial indicators of the predictive model**

	Local roads	Wastewater treatment	Public lighting	Cemetery care	Municipal waste	Greenery care	Total
Current expenditures	0.597	0.837	0.874	0.116	0.874	0.882	N/A
Capital expenditures	0.555	0.823	0.396	-0.368	0.871	0.683	N/A
Total expenditures	0.574	0.838	0.874	0.121	0.870	0.864	N/A

Source: Authors calculations, Data: Ministry of Finance of the Czech Republic (2017a), Ministry of Finance of the Czech Republic (2017b), Ministry of Finance of the Czech Republic (2017c).

The lowest accuracy of the model is in the case of cemetery care. Local roads show an average dependence. Strong dependency outweighs for most of other public services. Generally better results we can see in predictions of current expenditures. Capital expenditures are more difficult to predict. There is a huge difference between predictions in the period from 2001 to 2009 and the period from 2010 to 2012. The model showed almost no mistakes in the first period. However financial and economic crisis in the years 2010-2012 has caused a misalignment of real expenditures, so this model has become unsuitable for use.

For this reason, the H0 hypothesis can be rejected for all the analyzed public services at the level of importance 0.95. Therefore, H1 is valid. The predictive model based on autonomous expenditure and growth rate doesn't allow a satisfactory estimation of future development of municipal expenditures of six selected public services.

Regarding the above findings, it is appropriate to reflect the economic situation and GDP growth. There are correlations between selected public expenditures and GDP in table 3.

**Tab. 3: Individual correlations characterizing partial indicators based on GDP**

	Local roads	Wastewater treatment	Public lighting	Cemetery care	Municipal waste	Greenery care	Total
Current expenditures	0.766	0.773	0.832	0.883	0.939	0.856	-0.822
Capital expenditures	0.651	0.660	0.681	-0.056	0.488	0.783	0.155
Total expenditures	0.715	0.680	0.848	0.570	0.926	0.846	-0.807

Source: Authors calculations, Data: Ministry of Finance of the Czech Republic (2017a), Ministry of Finance of the Czech Republic (2017b), Ministry of Finance of the Czech Republic (2017c).

As can be seen in the correlations, there are different groups of municipal expenditures. In the case of six selected public services, we could achieve better results in a period of economic crisis. So, it is advisable to consider the incorporation of GDP as input data, thereby increasing the diversity of relevant inputs that would increase the accuracy of outputs. In the case of total expenditures (total current expenditures especially), we can see a real fiscal policy impact. Strong negative correlation means opposed development of expenditures and GDP. High expenditures help economic recovery in times of crisis.

Now there is reviewed the **structure** of municipal expenditures in this text. Current expenditures grow and the long-term trend is increasing. However, virtually all services reported decline (relative decline in relation to the total volume of expenditures) in the crisis year 2009.

Capital expenditures also grow; they also react to the crisis, but some of them later than current expenditures. The reason is probably a greater need for long-term planning and a longer reaction time.

Since GDP predictive model is in some cases better than Constant growth predictive model, it is desirable to continue setting the parameters. Estimation of future development through GDP regression is characterized by the following equation (4) and table 4:

$$Exp^e = GDP \times r \quad (4)$$

$Exp^e$  – Expenditures expected in year (y)

GDP – Gross Domestic Product in the same year (y)

r – Regression parameter

y – Year

**Tab. 4: Individual regression parameters (r) of GDP model**

	Local roads	Wastewater Treatment	Public lighting	Cemetery care	Municipal waste	Greenery care	Total
Current Expenditure	0.0025	0.0003	0.0008	0.0001	0.0015	0.0012	0.128
Capital expenditures	0.0037	0.0025	0.0001	0.0001	0.0001	0.0003	0.022
Total expenditures	0.0062	0.0028	0.0009	0.0002	0.0015	0.0015	0.149

Source: Authors calculations, Data: Ministry of Finance of the Czech Republic (2017a), Ministry of Finance of the Czech Republic (2017b), Ministry of Finance of the Czech Republic (2017c).

Unfortunately, the scope of this paper doesn't allow a deeper analysis of the predictive model based on GDP development. This model isn't perfect itself. However, its composition with the above-mentioned constant growth predictive model would eliminate the inaccuracies of both models. This is a promising direction for future research.

Issues of expenditure decentralization and revenue decentralization are focused in the study Zhang et al. (2016). "Decentralization of expenditure and decentralization of revenue push up the size of local government budgets" (Zhang et al., 2016, p. 211). It means that decentralization eventually increased the impact of municipal budgets. For this reason, case studies are introduced here.

Examples of **local predictions** are in three case studies. There are three Czech municipalities chosen. The first one is Czech capital, largest city and largest municipal budget Prague. The second one is a municipality Bublava, which has some financial problems due to the construction of an aqua park. The third one is Modrava, which is one of the most financially stable Czech municipalities.

### 3.1 Case study Prague

The City of Prague is a separate administrative unit in the position of the region (NUTS 3: CZ010) and the statutory city at the same time (LAU 1: CZ0100). Prague has a cadastral area of 496 km<sup>2</sup> and 1,280,508 inhabitants. Table 5 contains correlations between Prague expenditures and the sum of all Czech municipal expenditures.

**Tab. 5: Individual correlations characterizing partial indicators based on total expenditures of 6258 Czech municipalities (example of Prague)**

	<b>Local roads</b>	<b>Wastewater treatment</b>	<b>Public lighting</b>	<b>Cemetery care</b>	<b>Municipal waste</b>	<b>Greenery care</b>	<b>Total</b>
Current Expenditure	0.856	-0.261	0.788	0.528	0.862	0.971	-0.116
Capital Expenditure	0.866	-0.685	0.793	0.672	0.758	0.927	0.771
Total expenditures	0.840	-0.713	0.814	0.228	0.920	0.960	-0.108

Source: Authors calculations, Data: Ministry of Finance of the Czech Republic (2017a), Ministry of Finance of the Czech Republic (2017b), Ministry of Finance of the Czech Republic (2017c).

Table 6 contains correlations between Prague expenditures and GDP.

**Tab. 6: Individual correlations characterizing partial indicators based on GDP (example of Prague)**

	Local roads	Wastewater treatment	Public lighting	Cemetery care	Municipal waste	Greenery care	Total
Current expenditures	0.589	-0.654	0.886	0.411	0.898	0.855	0.336
Capital expenditures	0.469	-0.786	0.604	-0.626	0.551	0.840	0.526
Total expenditures	0.505	-0.797	0.903	-0.389	0.935	0.864	0.385

Source: Authors calculations, Data: Ministry of Finance of the Czech Republic (2017a), Ministry of Finance of the Czech Republic (2017b), Ministry of Finance of the Czech Republic (2017c).

Slightly better results we reach in predictions based on the sum of all Czech municipal expenditures. There is no long-term trend influenced by time or economic situation in the structure of current expenditures. Some capital expenditures are gaining weight while economic grow and react negatively to the crisis (local roads, greenery care), some of them lose its significance all the time (wastewater treatment, cemetery care) and some evolves randomly (public lighting, municipal waste).

### 3.2 Case study Bublava

Bublava is in the Karlovy Vary Region (NUTS 3: CZ041), in the Sokolov District (LAU 1: CZ0413), in the city area with extended powers Kraslice, in the administrative district of municipalities with authorized municipal office Kraslice. It has a cadastral area of 6 km<sup>2</sup> and a population of 392. There are correlations of Bublava expenditures and Czech municipal expenditures in table 7.

**Tab. 7: Individual correlations characterizing partial indicators based on total expenditures of 6258 Czech municipalities (example of Bublava)**

	Local roads	Wastewater treatment	Public lighting	Cemetery care	Municipal waste	Greenery care	Total
Current expenditures	-0.307	-0.164	0.899	-0.876	0.422	-0.577	0.613
Capital expenditures	-0.213	0.053	N/A	N/A	0.283	N/A	-0.161
Total expenditures	-0.284	0.038	0.892	-0.486	0.373	-0.545	0.899

Source: Authors calculations, Data: Ministry of Finance of the Czech Republic (2017a), Ministry of Finance of the Czech Republic (2017b), Ministry of Finance of the Czech Republic (2017c).

There are correlations of Bublava expenditures and Czech GDP in table 8. Unfortunately, there are some expenditure items not available (N/A) in the tables 7 and 8 because some Bublava budget amounts are zero.

**Tab. 8: Individual correlations characterizing partial indicators based on GDP (example of Bublava)**

	Local roads	Wastewater treatment	Public lighting	Cemetery care	Municipal waste	Greenery care	Total
Current Expenditure	-0.025	-0.563	0.787	-0.846	0.500	-0.426	-0.513
Capital expenditures	-0.334	-0.099	N/A	N/A	0.124	N/A	-0.879
Total expenditures	-0.224	-0.113	0.787	-0.846	0.501	-0.426	-0.886

Source: Authors calculations, Data: Ministry of Finance of the Czech Republic (2017a), Ministry of Finance of the Czech Republic (2017b), Ministry of Finance of the Czech Republic (2017c).

None of these predictions and correlations is significant because of the size of Bublava budget. Even the budget structure of small municipalities has no clear trend.

## 8.1 Case study Modrava

Modrava is in the Pilsen Region (NUTS 3: CZ032) in the Klatovy District (LAU 1: CZ0322), in the city area with extended powers Sušice, in the administrative area district of municipalities with authorized municipal office Kašperské Hory. It has a cadastral area of 82

km<sup>2</sup> and a population of 72. There is an analysis of Czech and Modrava expenditures correlation in table 9.

**Tab. 9: Individual correlations characterizing partial indicators based on total expenditures of 6258 Czech municipalities (example of Modrava)**

	Local roads	Wastewater treatment	Public lighting	Cemetery care	Municipal waste	Greenery care	Total
Current expenditures	0.339	-0.100	0.345	N/A	0.531	0.254	-0.147
Capital expenditures	0.111	0.081	-0.534	N/A	N/A	N/A	-0.130
Total expenditures	0.203	0.060	-0.056	N/A	0.585	0.182	-0.275

Source: Authors calculations, Data: Ministry of Finance of the Czech Republic (2017a), Ministry of Finance of the Czech Republic (2017b), Ministry of Finance of the Czech Republic (2017c).

There is an analysis of GDP and Modrava expenditures correlation in table 10. Modrava does not provide cemetery care, which means these expenditures are zero and not applicable for correlation analysis.

**Tab. 10: Individual correlations characterizing partial indicators based on GDP (example of Modrava)**

	Local roads	Wastewater treatment	Public lighting	Cemetery care	Municipal waste	Greenery care	Total
Current expenditures	0.500	0.040	0.496	N/A	0.456	0.126	0.346
Capital expenditures	0.121	0.084	-0.691	N/A	N/A	N/A	0.530
Total expenditures	0.468	0.084	-0.061	N/A	0.456	0.126	0.559

Source: Authors calculations, Data: Ministry of Finance of the Czech Republic (2017a), Ministry of Finance of the Czech Republic (2017b), Ministry of Finance of the Czech Republic (2017c).

None of these correlations are significant enough to make predictions because of the size of Modrava budget. No clear trend can be found for the same reason.

## Conclusion

Some factors (such as the phase of the economic cycle) have a greater impact on public budget size, but also affect its internal arrangement because superfluous expenses are restricted first. The impact of other factors (such as legal and demographic environment) is primarily structural, but also these factors are reflected in the size of the public sector. Bohn (2005) provides the general macroeconomic view on sustainability, fiscal data, and economic growth of US public sector. The combination of sustainability and public sector is an area the Czech Republic and the European Union could be inspired in the United States or in Australia.

The hypothesis (H0) of the applicability of the predictive model was disapproved. The predictive model based on autonomous expenditure and constant growth rate don't allow a satisfactory estimation of future development (H1). General predictions based on this predictive model could be used in the economic growth. However, it is not applicable in times of economic crisis. This issue could be fixed by adding more parameters of the prediction like GDP.

Local predictions for specific municipalities are less accurate. The applicability of the model decreases with decreasing size of the analyzed municipality. Best results of local predictions are based on total expenditures of all Czech municipalities. Models build on GDP are not as accurate.

Possible improvement of the current situation could be modern approaches to public sector governance. This includes public-private partnership (PPP), other forms of cooperation with the business sector for accelerating regional development, concepts of smart cities, using IT and modern technologies et cetera.

Some theoretical publications are dedicated to this area. However, there are almost no studies on real data. For example, Ochrana (2007a), Ochrana (2007b) and Pavel (2006) deal with an analogical issue in Czech conditions. This is the opportunity for future cooperation.

This paper identified a possible direction for future research. The key to further work is the creation of a new model based on a combination of constant growth model and GDP model. This combined model could eliminate output errors of both models.

Main stakeholders, in this case, are public sector managers (e.g. mayors, secretaries, and officials) and private sector companies (especially suppliers and partners in PPP). Predictions are important for all stakeholders. Public managers can use predictions to better budget planning. Private managers can use predictions to focus activities on the prosperous sector.

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## LIFE CYCLE ASSESSMENT – A TOOL FOR EVALUATING THE LEVEL OF TECHNOLOGICAL ECO-INNOVATION

Magdalena Rybaczewska-Błażejowska

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### Abstract

**Purpose:** The intention of this article is to propose, examine and discuss an alternative approach for measuring the level of technological eco-innovation of enterprises, based on the methodology of life cycle assessment (LCA).

**Design/methodology/approach:** The main objective of this research is to verify a new methodology for measuring the level of technological eco-innovation of enterprises, based on LCA. The method of LCA that is conventionally applied to assess potential environmental impacts of individual goods or processes is translated into the evaluation of a whole company. In consequence, taking into account a production structure and manufactured products, results of life cycle impact assessment (LCIA) and the origin of impacts, an environmental profile of an enterprise is created. It has the form of matrix ( $MAT_{LCA}$ ).

**Findings:** A manufacturing company, representing the pulp and paper sector, was covered by the LCA analysis. The environmental profile of the paper mill, located in Poland, was calculated using specialised software SimaPro 8.1 and the ReCiPe method. It proved that the analysed enterprise has the most damaging effect on the environment in the following impact categories: freshwater eco-toxicity, marine eco-toxicity and natural land transformation. They result from the graphic paper, exactly materials (cellulose) used, and the process of graphic paper production, exactly energy (electricity, thermal energy and natural gas) consumption. Consequently, to be more technologically eco-innovative, first of all, the paper mill needs to move towards more energy-efficient technologies.

**Research/practical implications:** The research proved high applicability of the proposed methodology for evaluating the level of technological eco-innovation of enterprises. Due to its universality, the method can be used both at micro level by individual enterprises and at macro level by policy makers to make a benchmark analysis of technological eco-innovation.

**Originality/value:** This is a fully original study that proposes a new approach for quantitative description of the level of technological eco-innovation.

**Keywords:** Eco-innovation, Enterprise, Life cycle assessment (LCA)

**JEL Codes:** M11, O32, Q56

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## Introduction

Following the OECD definition of innovation, eco-innovation means “the production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organisation (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives” (Kemp and Pearson, 2007). Although four types of eco-innovation can be distinguished, in the case of comparative analysis of enterprises from the same sector or region, the definition of eco-innovation can be narrowed down to product and process oriented eco-innovations (TPP), called as technological eco-innovations (see Fig. 1) (OECD and Eurostat, 2005). Technological eco-innovations are associated with eco-designing of products and greening technologies, equipment and/or software (ISO/TR 14062:2002). Sample benefits of implementing the technological eco-innovations are as follows: reducing material, energy and natural resources consumption, reducing the pollution emission and/or facilitating reuse and recycling (Zarębska and Michalska, 2016).

**Fig. 1: Typology of eco-innovation**



Source: Own research

Despite the fact that there are multiple methods and indicators for measuring eco-innovation at the macro, meso and micro level, the comprehensive evaluation of eco-innovation is still a very difficult task (Kaczmarska, 2015). Essentially, the methods applied for analysing eco-innovation can be divided into four categories, such as: input measures, based on R&D statistics, intermediate output measures, based on patents and scientific publications statistics, direct output measures, based on innovation and their description statistics, and finally indirect impact measures derived from aggregate data regarding an absolute environmental impact, for instance energy consumption, emissions and waste release (Arundel and Kemp, 2009). However, the latter becomes unexplored realm of research, especially at the entrepreneur's level (Diaz-Garcia et al., 2015).

The aim of this article is to propose an alternative approach for measuring the level of technological eco-innovation of enterprises, based on the methodology of life cycle assessment (LCA). It can be classified as indirect impact measure. The application value of the proposed approach is discussed upon a case study of large enterprise, representing the pulp and paper sector, located in Poland.

## 1 Methodology

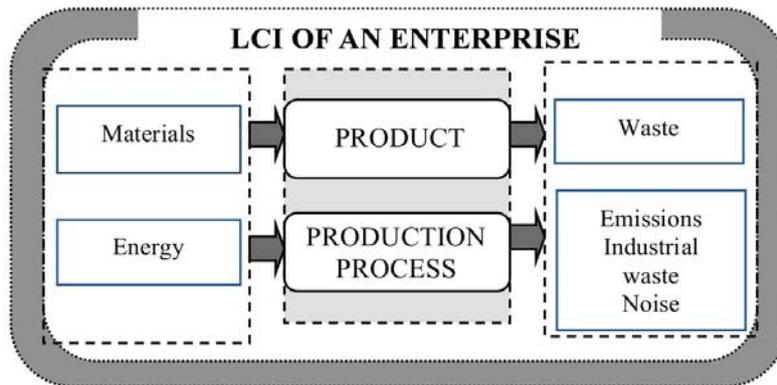
To measure the level of technological eco-innovation of an enterprise, the three-step approach is proposed that consists of the following steps:

- I. Performance of life cycle assessment (LCA) for products and related to them production processes. This stage requires the definition of the goal and scope of the LCA analysis, the collection of input and output data (life cycle inventory, LCI) and finally the calculation of the environmental impacts of the examined products and processes (life cycle impact assessment, LCIA), expressed per produced product unit.
- II. Formation of a matrix ( $MAT_{LCA}$ ) on the basis of the LCIA results achieved in the first step multiplied by the yearly production capacity of an enterprise. In benchmark studies, instead of yearly production, the LCIA results are weighted following the production structure of a given enterprise.
- III. Calculation of the contribution of individual processes in the environmental impact categories selected in the first step for product and/or production processes selected in the second step.

### 1.1 Product and process oriented approach

One of the pivotal attributes of the proposed approach is the separate performance of the LCA analysis for products and related to them production processes as to indicate the direction of eco-innovative actions (implementing eco-innovations within product and/or production process). This requires, however, the division and allocation of environmental input and output data between the product and the process that, in the case of complex product systems, might be difficult and thus need to be solved individually. Basically, it was decided that materials and non-industrial waste are product relevant, whereas energy, emissions to air, water and soil, industrial waste and noise are process relevant (see Fig. 2).

**Fig. 2: General scheme of a product and related to it production process life cycle inventory**



Source: Own research

### 1.2 Environmental profile of an enterprise

Another pivotal attribute of the proposed approach is the calculation of an environmental profile of an enterprise upon the results of the LCA analysis and presenting it in the matrix form ( $MAT_{LCA}$ ) (1). The rows in the matrix represent the product systems (products and related to them production processes), whereas the columns represent environmental impact categories of the LCIA method. Consequently, it is a set of sums  $S$  of matrix elements  $a_{ij}$  for each  $j=const$  (2).

$$MAT_{LCA} = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1m} \\ a_{21} & a_{22} & \dots & a_{2m} \\ \dots & \dots & \dots & \dots \\ a_{n1} & a_{n2} & \dots & a_{nm} \end{bmatrix} \quad (1)$$

$$S_{j=const} = \sum_{i=1}^n a_{ij} \quad (2)$$

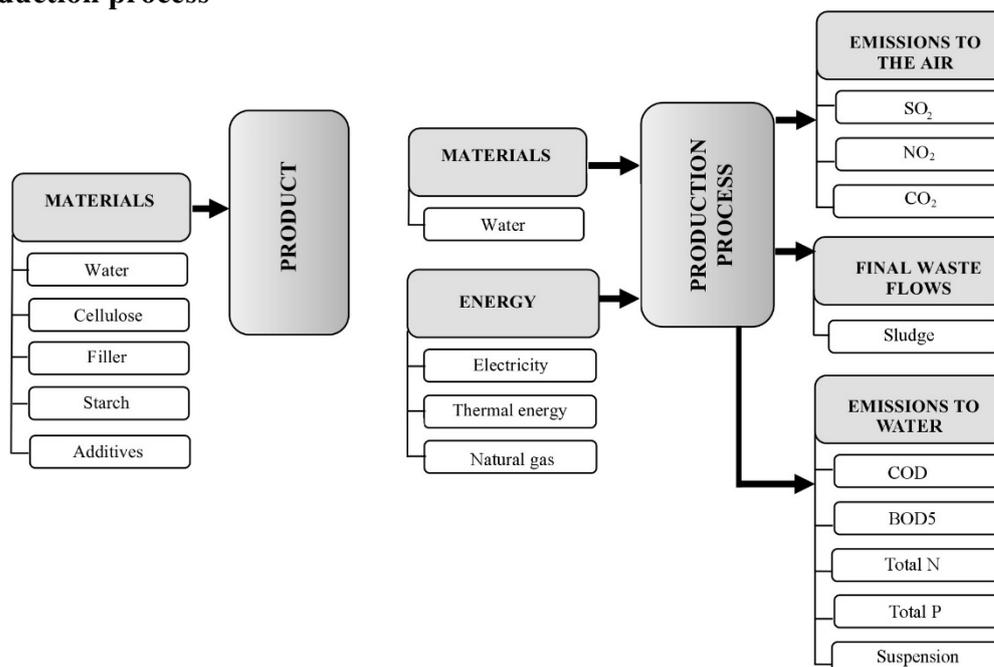
## 2 Results

### 2.1 Life cycle assessment (LCA) framework

The study aims to evaluate the level of technological eco-innovation through the identification and prioritisation of environmental impacts of a manufacturing company, representing the pulp and paper sector. It is one of the leading European paper mills, employing more than 1500 people in three production facilities in Sweden, Poland and Germany. The scope of the LCA analysis covers products i.e. high quality offset paper and graphic paper, and their production processes taking place in the paper mill in Poland. The reference point in the inventory of data is the mass-based unit of 1 Mg of the final product.

Life cycle inventory (LCI) of the paper mill covers two types of environmental data, input-based and output-based. The first ones cover raw materials and energy, whereas the second ones cover emissions to the air and water, waste and noise (see Fig. 3). All environmental interventions are either product or production process related, however both products (high quality offset paper and graphic paper) and their production processes have similar environmental characteristics. Wherever there was a need to separate the environmental inputs between product and its production process, the allocation rule was applied. All LCI data was collected from the researched paper mill through a direct contact with the environmental manager and an analysis of company's environmental reports.

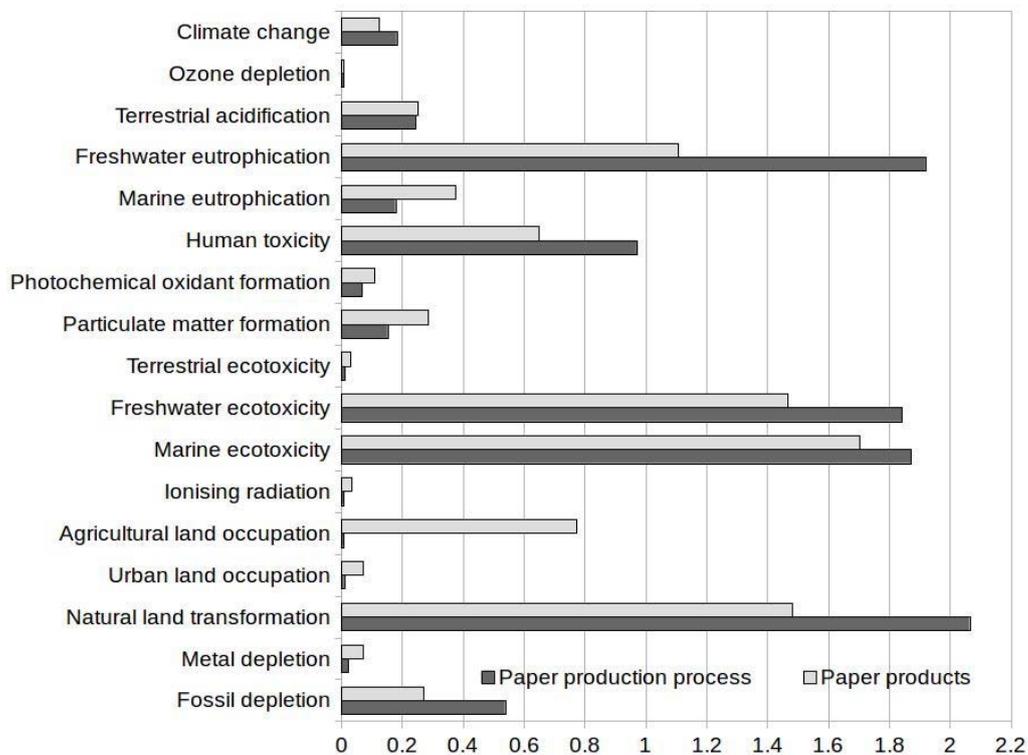
**Fig. 3: General scheme of life cycle inventory of the offset/graphic paper and their production process**



Source: Own research

Life cycle impact assessment (LCIA) of the paper mill was performed using specialised software SimaPro and the ReCiPe Midpoint(H) method. Normalised environmental profile of 1 Mg of analysed products and their production processes proved that the greatest environmental impacts occur in the following impact categories: marine eco-toxicity (3.57), natural land transformation (3.55), freshwater eco-toxicity (3.31), freshwater eutrophication (3.03) and human toxicity (1.62) (see Fig. 4). Although the environmental impacts in the above-enumerated categories are basically process specific, the products have also considerable share in their formation.

**Fig. 4: Life cycle impact assessment of 1 Mg of offset/graphic paper and their production processes**



Source: Own research

## 2.2 Matrix ( $MAT_{LCA}$ ) formation

As to achieve the environmental profile of the paper mill, the LCIA results for individual products and their production processes were multiplied by their production levels and thus are presented in the absolute values (see Fig. 5). Normalised environmental profile of the paper mill shows that the company generates the largest negative impacts in the following impact categories: marine eco-toxicity (997113), natural land transformation (989549), freshwater ecotoxicity (922395), freshwater eutrophication (844043) and human toxicity (451729). Taking

into account the company's production structure, the graphic paper and its production process is responsible for the majority of environmental impacts.

**Fig. 5: Normalised environmental profile of the paper mill**

$$\text{MAT}_{\text{LCA}} = \begin{bmatrix} 46596 & 2124 & 75035 & 459837 & 84354 & 246103 & 26848 & 66602 & 6480 & 502523 & 543230 & 6482 & 118415 & 12440 & 539109 & 14128 & 123061 \\ 38932 & 1774 & 62694 & 384206 & 70480 & 205626 & 22432 & 55648 & 5414 & 419872 & 453883 & 5416 & 98939 & 10394 & 450440 & 11804 & 102821 \end{bmatrix}$$

where the rows  $i \in (1, 2)$  represent products and their production processes: 1 - offset paper, 2 - graphic paper; whereas the columns  $j \in (1 \dots 20)$  represent environmental impacts categories: 1 - climate change, 2 - ozone depletion, 3 - terrestrial acidification, 4 - freshwater eutrophication, 5 - marine eutrophication, 6 - human toxicity, 7 - photochemical oxidant formation, 8 - particulate matter formation, 9 - terrestrial ecotoxicity, 10 - freshwater ecotoxicity, 11 - marine ecotoxicity, 12 - ionising radiation, 13 - agricultural land occupation, 14 - urban land occupation, 15 - natural land transformation, 16 - metal depletion, 17 - fossil depletion)

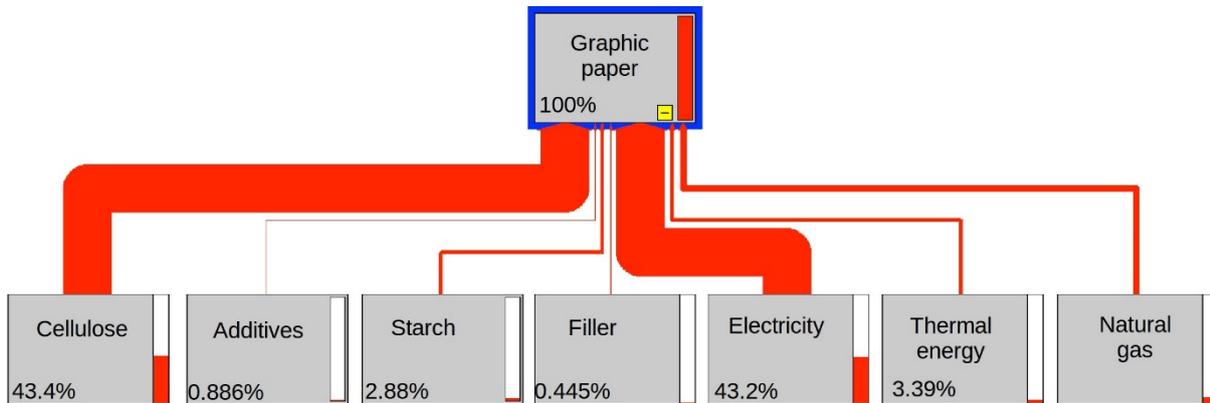
Source: Own research

### 2.3 Contribution analysis

Due to the fact that the environmental profile of the paper mill proved considerable impacts in the field of marine eco-toxicity, natural land transformation and freshwater eco-toxicity, being the result of the graphic paper and its production process, the potential contributions of individual inputs and outputs in the above impact categories were calculated.

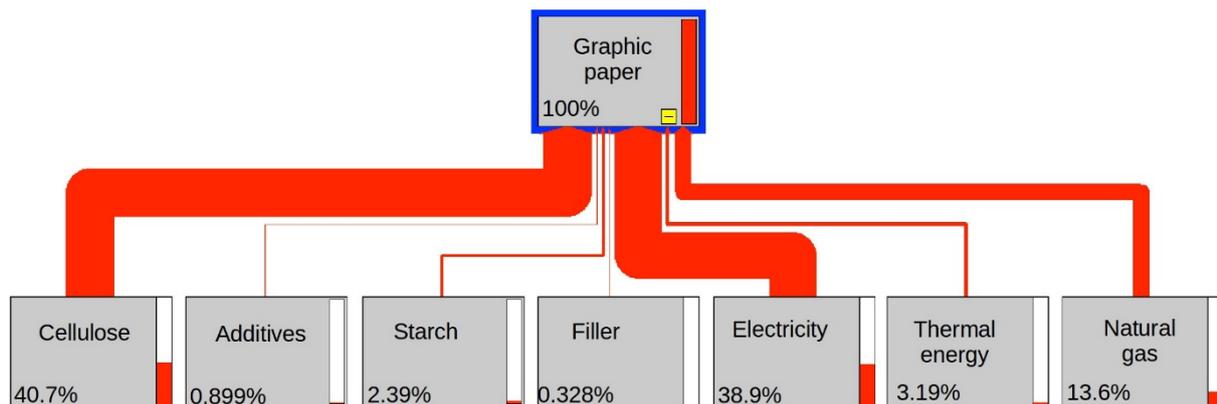
Eco-toxicity, divided into three different subcategories i.e. freshwater, marine and terrestrial, expresses toxic effect of chemicals on the environment and is based on both the inherent toxicity of a compound and its potential dose (Acero et al., 2017). The unit of the characterisation factor for eco-toxicity is kg 1,4 -dichlorobenzene equivalent (1,4-DB eq). The freshwater and marine toxic effect of 1 tonne of the graphic paper and its production process is estimated at the level of 67.5 1,4-DB eq. It results primarily from the use of cellulose, 43% and 41%, and electricity 43% and 39% in marine and freshwater eco-toxicity correspondingly (see Fig. 6 and Fig. 7).

**Fig. 6: The process tree of the graphic paper and its production process in the category of marine eco-toxicity**



Source: Own research

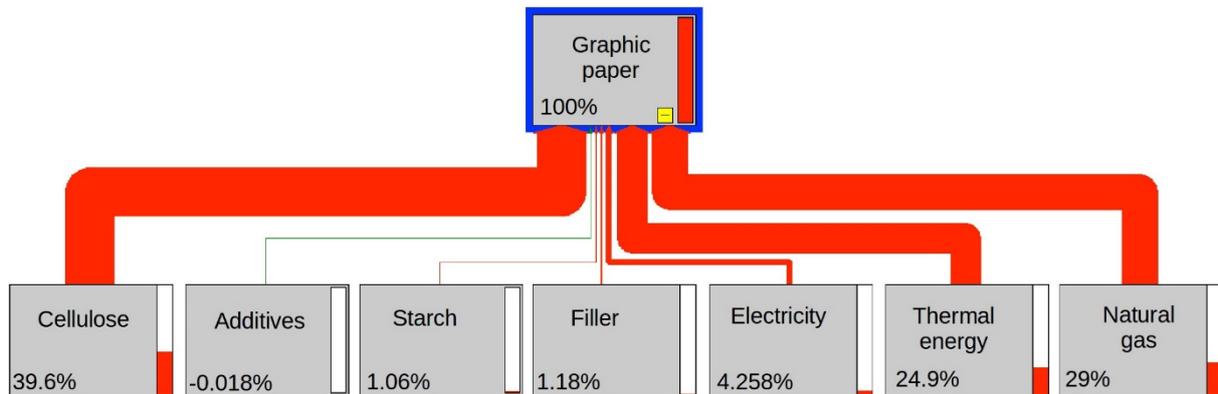
**Fig. 7: The process tree of the graphic paper and its production process in the category of freshwater eco-toxicity**



Source: Own research

Natural land transformation expresses the impact on the land due to the conversion of the existing land-use type into other type, for instance agriculture, anthropogenic settlement and resources extractions that, in consequence, makes damage to ecosystems (Goedkoop et al., 2013). The unit of the characterisation factor of natural land transformation is  $m^2$ . 1 tonne of the graphic paper and its production process in the research paper mill is associated with the transformation of  $0.573 m^2$  of natural land; 40%, 29% and 25% of this impact is made by cellulose, natural gas and thermal energy, respectively (see Fig. 8).

**Fig. 8: The process tree of the graphic paper and its production process in the category of natural land transformation**



Source: Own research

## Conclusion

The article proposes, examines and discusses the alternative approach for measuring technological eco-innovations that refers to the methodology of life cycle assessment (LCA). The conducted research of eco-innovation of the paper mill, based on the proposed approach, reveals that the analysed enterprise has the most damaging effect on the environment in the following impact categories: freshwater eco-toxicity, marine eco-toxicity and natural land transformation. They result from the graphic paper, exactly materials (cellulose) used, and the process of graphic paper production, exactly energy (electricity, thermal energy and natural gas) consumption. Therefore, as to reduce the negative impacts on the environment, and thus to be more eco-innovative, the paper mill needs to move towards more energy-efficient technologies, depicted in the BAT document (2015).

Considering the above findings, from the perspective of an enterprise, the application of proposed approach brings numerous advantageous, since it enables the company to diagnose the source and the cause of its environmental impacts and thus to implement eco-innovative actions as to gradually reduce them. Moreover, in the long term, besides obvious environmental benefits, companies can gain the economic ones, including lower costs of production.

Finally, the proposed approach has universal character, since it can be applied not only at the single enterprise level, but also at the sector and national level for benchmarking analyses. The environmental data, though, can be obtained either directly from entrepreneurs, as was the case of the described research, or existing statistics of national environmental accounting. Consequently, the achieved results are an impulse for prospective and more detailed research on measuring the technological eco-innovation, including other companies, sectors and levels.

## Acknowledgment

I would like to thank the anonymous reviewer for the time, understanding and constructive suggestions.

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# THE ROLE OF THE ACADEMIC ENTREPRENEURSHIP ECOSYSTEM IN BUILDING ENTREPRENEURIAL AND INNOVATION POTENTIAL. CONCLUSIONS FROM CHOSEN POLISH UNIVERSITIES

Anna Sęk

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## Abstract

**Purpose:** In the second decade of the 21<sup>st</sup> century societies and economies have visibly concentrated around entrepreneurship and innovation. Academic entrepreneurship emerged as one of the ecosystems supporting these trends. However, scientific research dedicated to entrepreneurship education does not seem to be extensive enough. The present study shall have its contribution by trying to analyse the role and measure the effectiveness of academic entrepreneurship and its institutions in the process of building socio-economic potential in terms of entrepreneurship and innovation given the local context.

**Design/methodology/approach:** The study conducted in March 2017 was designed to verify whether the activity of particular entities within the academic entrepreneurship ecosystem promotes entrepreneurial and pro-innovation behaviours among students. The qualitative part of the study was based on structured in-depth interviews with academic teachers of business and non-business universities. The quantitative sample was obtained with the use of a standardized questionnaire directed to students from several Polish universities. The data were complemented by a documentary analysis of reports and statistics related to the subject.

**Findings:** The gathered data have shown that Polish students from the selected universities have some interest in entrepreneurial and pro-innovative activity, but level of their entrepreneurial knowledge is not satisfactory. The obtained data suggest some mismatch between the relatively complex and quickly evolving academic entrepreneurship ecosystem in the region and the level of profits it shall bring to its potential beneficiaries.

**Research/practical implications:** The study tries to draw practical conclusions from how the functioning of the academic entrepreneurship ecosystem translates into particular behaviours and attitudes. The recommendations of the paper shall be useful to regional educational and economic policies in terms of cooperation between education, science and business.

**Originality/value:** The paper contributes to the overall discussion over building entrepreneurial and innovation potential in the society by way of cooperation between universities and businesses. Relatively new and constantly changing ecosystem of academic entrepreneurship is still quite disorganised and unregulated. The study attempts not only to explain and categorize it but also to measure the actual quality of entrepreneurship education. A concise assessment of the academic entrepreneurship ecosystem is provided based on the analysis of its chosen entities within selected Polish universities.

**Keywords:** academic entrepreneurship, entrepreneurship education, innovation, science and business cooperation, local context

**JEL Codes:** I23, L26, O31

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## **Introduction**

More than 70 years ago Joseph Schumpeter used the term 'creative destruction' *to describe how innovation in industry creates new societies by destroying old ones* (Atkinson et al., 2014: 310). According to the Austrian economist, activity of an entrepreneur-innovator and so created new value are the factors that stimulate the economic development (Schumpeter, 1960). Drucker (1985) also wrote about a profound shift from the model of a 'managerial' to an 'entrepreneurial' economy. Nowadays this approach still applies – a creative economy of knowledge is emerging and the society is becoming more concentrated around innovation (Matusiak, 2010). Knowledge has been gradually replacing labour and capital as basic sources of social well-being. The capability to create and transform knowledge into new products, services and technologies determines market success of enterprises and economy as a whole (PARP, 2011).

The emerging model of the knowledge-based economy makes closer cooperation between universities and business necessary and this cooperation has taken relatively complex forms. A stereotyped view that establishing a company and making any commercial attempts are contrary to scientific work is no longer valid. The new approach provides for the development of the 'third generation university' (Wissema, 2009), whose activity includes – apart from education and scientific research – fostering entrepreneurship, a crucial element in the process of building international innovation potential and competitiveness.

The growing interest in entrepreneurship and innovation as significant elements of the socio-economic reality enhanced the need to develop a system that would support these ideas in institutional, legal and organisational terms. There have been introduced various initiatives aimed at supporting entrepreneurship within particular groups (i.e. academic environment, women, people over 50 years of age) and sectors (i.e. entrepreneurship of SMEs, e-entrepreneurship). The entire process of promoting the development of new companies addressed to potential entrepreneurs resulted in creation of ecosystems, including the academic entrepreneurship ecosystem.

The attempt to explain and categorize entrepreneurship has been a subject of many empirical and theoretical studies. The natural next step in the research of entrepreneurship education is measuring the actual quality of this education. The present study shall, thus, provide a concise assessment of the academic entrepreneurship ecosystem based on the analysis of its chosen entities within Polish higher education.

## **1 Theoretical frames of the academic entrepreneurship ecosystem**

### **1.1 Origins and status of academic entrepreneurship**

The new approach to the function of academic centres emerged more than 50 years ago at American universities. The Massachusetts Institute of Technology and Stanford University initiated contacts with the business environment, which was a groundbreaking achievement leading to the new model of scientific institutions (PARP, 2011). In the recent study by Graham (2014) conducted with the aim to indicate the world's most highly-regarded entrepreneurial universities, from over 200 universities – three were consistently cited as the world leaders: the above-mentioned MIT, Stanford University and the University of Cambridge. Nowadays, it has been assessed that around 80% of American universities offer elements of entrepreneurship education in their curriculum (PARP, 2011).

In Europe, the status of entrepreneurship education has not been established so well yet. Although it has been present for 20-30 years there, neither level of cooperation between universities and business, nor the number of companies emerging from the academic environment is as satisfying as in the US. In context of innovation potential, many authors write about 'a European paradox'. It means that although European countries are leaders in the area of scientific research, they are unable to translate this potential into creating market innovations (Mazzucato, 2017).

In Poland, the early 90s brought real interest in entrepreneurship, which has also been reflected in the academic setting. More than a hundred private business schools established at that time were given the word 'entrepreneurship' in name. Also, public universities opened institutes and departments of entrepreneurship. At the beginning, entrepreneurship education was restricted to business and economic studies, which later extended to entire higher education. The quality and effectiveness of the offered programmes may have given rise to some doubts, though (PARP, 2011).

### **1.2 'Entrepreneurship' vs. 'academic entrepreneurship'**

In the entrepreneurial society – still more popular in America and Western Europe – it is the state that promotes the idea of entrepreneurship (Lichniak et al., 2011). The author states that entrepreneurship is *the process that characterises a developed market economy, where initiative, ingenuity and innovation potential translate into emergence and development of the middle class* (Lichniak et al, 2011: 13). Also Drucker (1985) has referred to entrepreneurship as the knowledge-based 'practice of innovation' and suggested that like any other practice it can

be learned. According to Cieřlik (2017), for many decades entrepreneurship used to be associated with traditional small businesses but recently *there has been a tendency to look at entrepreneurship as a wider phenomenon, which manifests itself in entrepreneurial attitudes and methods being applied outside the economic sphere* (2017: 16-17). This includes, among others, contribution of higher education institutions to the promotion of entrepreneurship. As defined by Schaeffer & Matt (2016: 5), *academic entrepreneurship focuses on scientist's inventions but has evolved recently towards a broader vision that includes other stakeholders such as students, alumni and post-doctoral fellows* and enhancing these groups to establish their own companies – companies that should be ambitious, dynamic and innovative in nature, based on specialist knowledge (PARP, 2011).

### **1.3 Ecosystem of academic entrepreneurship**

In a general context, the term 'ecosystem' refers to the initiatives taken up by various entities and in different forms, all of which aim at supporting broadly understood entrepreneurship. It includes business-friendly legislation and policies, access to funding and entrepreneurship education, to mention just a few.

For the academic entrepreneurship ecosystem to be effective it should be comprehensive in character and include the following five stages (PARP, 2011):

1. Promotion of academic entrepreneurship – understood as popularisation of the basic knowledge and information about creation and development of a company and innovation processes in the academic environment;
2. Selection for entrepreneurship – including identification of especially entrepreneurial individuals and development of their pro-active behaviours and risk taking;
3. Pre-incubation – stage, at which selected business ideas are analyzed in terms of market opportunities, developed and the future entrepreneur is learning necessary business competences;
4. Incubation:
  - Incubation of knowledge-based projects – depending on founding companies by students based on their knowledge gained at the university;
  - Incubation of high-tech projects – depending on founding companies by scientific workers and PhD students based on their specialist knowledge gained during research projects;
5. Acceleration – understood as increasing development dynamics of new innovative enterprises based on specialist infrastructure and services; creative cooperation between

the world of science and business; building competitive advantage in national and global dimension.

At the university level there are taken multiple initiatives within academic entrepreneurship. They include internal entrepreneurship incubators, career offices, career guidance, mentoring for start-ups, start-up and innovation fairs, monitoring of graduates' careers, student science clubs dedicated to entrepreneurship and practical business trainings. A specific and actually the most popular form of support in the Polish setting is AIP (Academic Entrepreneurship Incubators) – an external foundation operating in close cooperation with Polish universities. Also, several science-technology parks and technology transfer centres function around universities, especially technical ones.

The governmental instruments of supporting academic entrepreneurship include the activity of institutions, such as Polish Agency for Enterprise Development (PARP) offering numerous programmes addressed at ambitious business plans, especially from the technology and B2B area. The relatively new key institution is Polish Development Fund (PFR), whose support is addressed mainly to innovative companies and start-ups and includes financing of the investment, innovation development and promoting foreign expansion.

At the national level, also appropriate legislation enables entrepreneurial and pro-innovation policy. Currently, a document that is much debated in Polish political reality is the new Act on Higher Education. It proposes a deep reform of universities and research institutes, as well as it introduces the possibility to make a scientific career in close relation to business career. Other important documents highlighting the importance of academic entrepreneurship and innovation include Act on Innovation or Responsible Development Plan.

Also, the European Union has its contribution in promoting scientific research and innovation. A relatively new initiative is the EU programme Horizon 2020 that focuses on the intensive cooperation between science and industry, especially in the area of SMEs. What is more, there have still been available funds for educational and business purposes coming from the EU operational programmes, such as Innovative Economy or Human Capital.

Lastly, an important role is granted to commercial institutions and programmes, especially in terms of the offered funding for young entrepreneurs. These include funds investing seed and venture capital in start-ups, commercial banks with their low-interest loans, investments by business angels, as well as different forms of entrepreneurial support provided to students and graduates by foundations (e.g. broad activity of Entrepreneurial Women's Network) or companies (e.g. a support business programme by KPMG).

#### **1.4 Role and objectives of academic entrepreneurship**

First of all, the role of academic entrepreneurship is to increase social awareness in relation to the importance of conducting business activity for the state's economy. According to GEM Poland (2016), perception of entrepreneurship among the Polish society is deteriorating, but their entrepreneurial mindset seems to be gradually strengthening. Actually, 20% of Poles want to set up their own company in the upcoming 3 years (compared to 13% of Europeans)<sup>47</sup>. Mazzucato (2017) cites the solid evidence suggesting that it is *new* dynamically developing enterprises and start-ups that are especially important to the state's economy, since they significantly contribute to generating employment. However, the role of academic entrepreneurship includes not only the creation of spin-offs but also support to strengthen the already existing SMEs (Schaeffer & Matt, 2016).

Also, the traditional role of the university as such should undergo some verification. The Humboldtian model of higher education – next to teaching and conducting scientific research – should be granted the third function understood as creation of active entrepreneurial behaviours necessary for independent activity on the market (PARP, 2011).

Last but not least, the academic entrepreneurship ecosystem is fostering natural relations between universities, business and government – and as a final objective – generating income. Universities need alternative funding for cutting-edge research, enterprises seek commercial profits, researchers should be paid for their scientific work and creation of patents and governments strive for innovation and technological progress of the state (Wissema, 2009).

## **2 Study**

Extensive research has already been conducted in the area of entrepreneurship. However, its academic dimension is a relatively new concept – still more implemented in practice than described by theory. Following some attempts to explain and categorize entrepreneurship education, there has come the need to assess the quality and effectiveness of its ecosystem.

The present study has theoretical and empirical character. It was designed to systematize components of the academic entrepreneurship ecosystem in Poland, as well as to verify whether the activity of particular entities within this ecosystem promotes entrepreneurial and pro-innovation behaviours among its beneficiaries.

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<sup>47</sup> Data of Global Entrepreneurship Monitor Polska for 2015. It is an increase of 4 percentage points compared to the previous year.

The applied research methods include structured in-depth interviews with representatives of academic staff concerning students' interest and engagement in activities within the academic entrepreneurship ecosystem. Another research tool was a standardized questionnaire directed to students from several Polish universities including questions about their knowledge of academic entrepreneurship initiatives, as well as about their abilities and intentions concerning the possible self-employment. The data were complemented by a documentary analysis of reports and statistics related to the subject.

## **2.1 Entrepreneurial and innovation potential among students – analysis and interpretation of data**

### **2.1.1 Statistics from the field**

Graduates of most faculties are commonly expected to have full time jobs, rather than to get self-employed (Lichniak et al., 2011). In order to change this attitude, entrepreneurship and innovation education should be offered to students of all faculties and perhaps mostly to non-business ones (i.e. technical studies, humanities, medicine and arts). Data show that students and graduates of science or technical faculties, who have learnt the basics of entrepreneurship, are generally more likely to achieve success in business compared to graduates of business schools (PARP, 2011).

The PARP report (2009) states that the degree of academic entrepreneurship development (understood as running own spin-off/spin-out businesses) is marginal: *only 6% of the respondents runs their own business (9% of the research staff and 2% of students)*. Far more satisfactory data concern intentions of students (51%) and research workers (31%) as to establishment of their own businesses.

Another important statistic for the condition of the Polish academic entrepreneurship is the number of patents granted by the European Patent Office, which in 2016 was record and amounted to 180 (an increase by 19.2% compared to the previous year). It should be noted that the main driving force in the patent activity in Poland are universities, followed by enterprises and research centres, as opposed to other European countries. The most active patent applicant to the EPO in 2016 was Jagiellonian University (with 12 applications) and pharmaceutical company Polpharma (with 10 applications).

### **2.1.2 Academic entrepreneurship in the opinions of research workers**

The qualitative part of the study was based on interviews conducted with representatives of Polish universities who were asked three questions about broadly understood condition of

academic entrepreneurship at their universities. The study was conducted in March 2017. The sample included two universities – SGH Warsaw School of Economics (as a business school) and The John Paul II Catholic University of Lublin (as a non-business school). In order to obtain and compare data from different academic settings, the selected universities varied in profile. The interviewee from the business university represented the Collegium of Business Administration and the interviewee from the non-business school – the Faculty of Law. The applied research method in this part of the study was a structured in-depth interview conducted twice. The interviewee from SGH Warsaw School of Economics was addressed in person. The interview took place at the university and lasted around 90 minutes, during which the interviewee responded the given questions and added more personal observations related to the subject. The interviewee from the Catholic University of Lublin obtained the questions in a written form via the Internet and by the same means they were sent back. The analysis of the achieved responses was done in a comparative way so that the conclusions could be drawn according to the profile of the university.

The first question was related to the presence of initiatives promoting entrepreneurial and pro-innovation attitudes among students. A respondent from a business school noted the fact that the new authorities of the university very much welcome promotion of entrepreneurship. Generally, in his opinion, the university's offer is comprehensive, including both obligatory and optional classes and activities. He mentioned, among others, an internal university incubator and entrepreneurship training that come next to obligatory course of entrepreneurship. The other respondent (from a non-business school) answered that his university offers some meetings, trainings, conferences and seminars (e.g. business ethics) that generally enhance entrepreneurial behaviours.

The next part of the interview was dedicated to students and graduates' characteristics and their interest in entrepreneurship and pro-innovation activities. The representative of a business school made an observation that a real interest in entrepreneurship has been present at his university for 5 years or even less, contrary to what is often stated in literature from the field. To go further, a 'real interest' in entrepreneurship (arising from internal motivation) is showed by around 1/5 of his students participating in such courses. Generally, in his opinion, the results manifested by starting 'real' entrepreneurial activity by students are rather weak. However, what is encouraging – more and more students deliberately choose to work in start-ups, instead of corporations, where they can gain holistic business experience. The respondent from a non-business university characterised most students as 'not especially independent and

focused on ready solutions'. However, his observations suggest that it does not prevent them from an active presence on the market.

A final question concerned the importance and the possible forms of supporting entrepreneurial and pro-innovation attitudes in academic environment. A respondent from a business school underlined the necessity of the cooperation between universities of different profiles. As his experience shows, best results in terms of business activity come from the combination of economic and technical knowledge. He added he would very much welcome more 'empirical projects' in entrepreneurship education and, last but not least, he would strongly promote the activity of start-ups as the safest business option for young entrepreneurs. The academic teacher from the non-business university said that every practical knowledge seems to be useful in the market economy. He also highlighted practical character of entrepreneurship trainings and suggested that they should be the part of the last term of both bachelor and master degree studies.

### **2.1.3 Results of the survey**

The final – quantitative – part of the study was conducted with the use of a standardized questionnaire entitled *Academic entrepreneurship in building entrepreneurial and innovation potential among students*. It included questions about students' knowledge of academic entrepreneurship initiatives, as well as about their abilities and intentions concerning the possible self-employment. The questionnaire was distributed online among Polish students in March 2017. The survey could have reached approximately 900-1000 students from both business and non-business universities, such as SGH Warsaw School of Economics, The John Paul II Catholic University of Lublin, The Maria Grzegorzewska University and Warsaw University of Life Sciences. The logic that stood behind the selection was to differentiate the university profiles and faculties and obtain responses from various academic backgrounds. The respondents were supposed to indicate in the questionnaire whether they were students of businesses or non-business studies. This division was made in order to present the conclusions in possibly the most transparent way.

The response rate amounted to around 9-10%, since the questionnaire has been completed by 90 respondents. 21% of them were students of business studies and 79% – of non-business studies. 51% of the respondents were students of master degree studies and 49% – of bachelor degree studies. The survey included 10 closed-ended and semi-open-ended questions related to students' knowledge of academic entrepreneurship initiatives, as well as about their possible self-employment.

Only 34% of the respondents admit to have encountered the notion of 'academic entrepreneurship' before. Most students (57%) do not have opinion whether the academic environment is open towards the ideas of entrepreneurship and innovation and only 36% of the respondents answered positively to this question. As to the forms of entrepreneurial activities provided by their university students indicated career offices (53%) and lectures on the matters related to entrepreneurship (49%), followed by professional consulting (32%) and practical entrepreneurship trainings (23%). According to the surveyed students, the most popular institutions of the academic entrepreneurship ecosystem are the National Centre For Research and Development (44%), Academic Entrepreneurship Incubators (40%) and the Polish Development Fund (39%). Just a few respondents know such entities as business angels network (12%) and seed capital funds (2%). Only 7% of the students answered to have tried any of the entrepreneurship support forms, which is quite alarming. Not many more (20%) intend to take advantage of these support forms in the future but as many as 70% still have not decided about it yet. Students generally have no opinion whether the academic support provided by their schools as to the development of entrepreneurship is satisfactory (61%) and only 11% of them answered positively to this question. 40% of the respondents feel positive about their professional preparation to engage in a potential business activity. What is interesting, more than a half (52%) of the surveyed students plan to get employed in a public institution or enterprise, 29% of them intend to work in a private company and only 19% think about having their own business. Finally, most students (56%) assessed their knowledge of matters related to self-employment as average, whereas as many as 34% admitted knowing practically no business issues.

#### **2.1.4 Limitations**

Both the qualitative and quantitative samples used in the study may be subject to certain limitations. In relation to the qualitative part, the made observations are strictly personal and – to some extent – may be subjective in character. The conclusions cannot be extended to all Polish business and non-business universities. The objective standing behind this part of the study was to present the current level of interest in the area of entrepreneurship in two different academic backgrounds both among students and academic staff. In the case of the quantitative part of the study, limitations pertain to the number of respondents and their actual experience with entrepreneurship. The provided sample of 90, together with the rest of gathered data, enabled to formulate certain conclusions, however, the findings to be complete definitely require further research. Lastly, it must be remarked that most of the respondents seem not to

have much of entrepreneurial experience, which also might have affected the results of the survey. Given a more entrepreneurial group of respondents, eg. owners of start-ups or participants of entrepreneurship incubators, the achieved statistics could probably differ to some extent.

## **Conclusion**

The overall analysis of the gathered data does not lead to highly satisfactory conclusions. The conducted study showed that students of the selected Polish universities show relatively little interest in entrepreneurial and pro-innovative activity and their knowledge on self-employment matters also seems to be rather general. As provided in the analysis, the academic entrepreneurship ecosystem in Poland provides wide support as to the development of entrepreneurial behaviours. However, it appears that there may lack appropriate information about particular initiatives in the academic environment. As the survey indicated, in many cases students do not know how to start taking advantage of the existent ecosystem so that their entrepreneurial potential can be realized. Therefore, based on the obtained data, some mismatch is observed between the relatively complex and quickly evolving academic entrepreneurship ecosystem and the level of profits it shall bring to its potential beneficiaries. On the other hand, strong sector of start-ups, growing number of patents and general interest of universities in promoting entrepreneurship education reflect a further need to foster the development and improvement of this ecosystem.

It is recommended for educational and economic policies to strengthen links between education, science and business. First, there is a need to raise common awareness as to the importance of businesses activity for the state's economic growth. The academic entrepreneurship ecosystem should aim at boosting social potential in terms of readiness to establish new innovative companies. Second, universities should take on another function and play an active role in the exploitation of their knowledge. Third, the academic entrepreneurship ecosystem must become an explicit instrument of economic growth in the knowledge economy by way of advanced science- and technology-based commercial activities.

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## **CORPORATE SOCIAL RESPONSIBILITY FROM THE PERSPECTIVE OF COMPANIES PROVIDING EXPRESS COURIER SERVICES IN THE CZECH REPUBLIC**

**Dana Sommerauerová – Tomáš Kučera – Jaroslava Hyršlová**

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### **Abstract**

**Purpose:** Corporate social responsibility (CSR) has been lately an extensively discussed topic. CSR has influence on how customers see companies. This concept is important not only for customers, but also for other stakeholders such as are the following: investors, employees, the general public, media, the state and other. With the development of e-commerce social responsibility issues become more and more important for companies providing express courier services. The aim of this paper is to present and to compare approaches taken by the selected companies providing express courier services in the Czech Republic territory to CSR issues.

**Design/methodology/approach:** The theoretical background of this paper is based on foreign and domestic literature. Information published by the selected companies on their individual web pages is used in this paper. The focus of attention is approaches of the above-mentioned companies to CSR regarding their economic, environmental and social aspects and impacts. Research methods used for data analysis included content analysis and comparative analysis of publicly available information.

**Findings:** This paper focuses on presenting the individual approaches of the selected companies to CSR. These individual approaches are compared on the basis of economic aspects, environmental aspects and social aspects and on the basis of those impacts that get the biggest attention from the individual selected companies.

**Research/practical implications:** This paper summarizes publicly available information about the individual selected companies' approaches to CSR. This collected information is analysed and compared with regard to important economic, environmental and social aspects and impacts of these companies. Programs that are implemented by the individual selected express courier services companies in accord with CSR are the subject of the research interest.

**Originality/value:** This paper summarizes and compares approaches of the selected companies providing express courier services in the Czech Republic territory to CSR issues. The experience gained in this research contributes to extending the knowledge in the area of CSR with regard to this type of companies that are becoming increasingly important thanks to growing significance of e-commerce.

**Keywords:** express courier services, corporate social responsibility, environmental aspects, social aspects

**JEL Codes:** M14, Q01, Q56

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## **Introduction**

Business entities both large and small and medium-sized companies regardless of their legal form and regardless of their industry sector significantly contribute to sustainable development of the entire society. Doing business in agreement with the sustainable development concept requires changes in all business processes and in the entire company management system. A whole range of measures and procedures must be introduced into company practice in order to achieve compliance with company goals in the area of sustainability. Doing business in compliance with sustainable development principles is characterized by the fact that the company is on the path towards sustainability; sustainability is the ultimate goal that the company strives to achieve (Dyllick and Hockerts, 2002). Currently sustainable business becomes the standard. Respecting this standard helps to change the perceived image of the individual business sectors and of individual companies in the eyes of the public and of other stakeholders.

This paper deals with the application of corporate social responsibility (hereinafter CSR) principles in selected companies providing express courier services in the Czech Republic territory. The main focus of our attention in this paper is primarily those CSR aspects that are the prime focus of attention of the mentioned companies.

## **1 Theoretical background and methodology**

Business success depends primarily on economic performance of a company, but it is also influenced by the environmental performance and by company's approach to social problems. In the existing globalized and turbulent environment companies are influenced by whole range of trends. Various stakeholders influence company's success, however, their interests are often different (Buchholz and Rosenthal, 2005). The CSR concept is based on a three-pillar concept of sustainable development (Elkington, 1998); the goal is such development of the business that provides for the balance between the three basic pillars: the economic, the environmental and the social pillars. According to Elkington (1998) this means to integrate the economic, the environmental and the social aspects into company's management. A lot of companies thus, on a voluntary basis (and beyond legal requirements) strive to integrate the environmental and the social perspectives into their business strategies and CSR principles are projected into company processes and general activities. The application of CSR principles must be however embedded into the company's strategic, process and value context. Corporate sustainability management strives to interlink the environmental and the social aspects with financial management and

competitiveness and it also very narrowly related to external communication about CSR activities.

In recent years the CSR concept has proven to be an important and widely discussed topic both on the academic grounds and on the corporate level. CSR is not only a fashion trend or a fashion idea but it represents a total company approach (Wu, 2002; Scherer and Palazzo, 2011). CSR is defined as responsible business, as corporate conscience or corporate citizenship; it is a form of corporate self-regulation integrated into a business model (Wood, 1991). According to McCarthy et al. (2017) it represents involving actions that appear to further some social good, beyond the interests of the company and beyond what is required by law. Standard ISO 26000 defines CSR as the responsibility of the company for impacts of the company's decisions and activities on the society and the environment; this responsibility is closely linked with transparent and ethical behaviour of the company (ISO, 2010). This provides the maximum contribution to sustainable development since inside the company all three key sustainability areas are integrated. The concept is based on the assumption that company long term success is based on the balance between the economic, the environmental and the social performance (Rahardjo et al., 2013) that is in agreement with stakeholders' interests; the permanent dialogue with the stakeholders is a very important aspect.

With regard to the development of e-commerce CSR issues become more important also for express courier services. There is high pressure to improve the efficiency of logistics services due to rising operating costs and due to fierce of competition among carriers. Additionally, society asks for higher standards of environmentally friendly transport practices. This is also true for express courier services and logistics service providers that have to fulfil in-time delivery under multiple constraints (Kunkel et al., 2010).

The aim of this paper is to present approaches of the individual selected companies providing express courier services in the Czech Republic territory to CSR and to compare these companies based on the economic, the environmental and the social aspects and impacts that get the most attention by these companies. The selected research methods used are the content analysis and the comparison analysis here. These methods are based on publicly available information about CSR activities provided by the selected companies on their company web pages. Based on this information those CSR aspects are identified which are considered important by these companies. The classification of CSR aspects is based on recommendation provided by the GRI (2017) on sustainability reporting. GRI is an international, independent organization that helps businesses, governments and other organizations understand and communicate the impact of business on critical sustainability issues such as climate change,

human rights, corruption and many others. GRI produces the world's most trusted and widely used standards for sustainability reporting, which enable organizations to measure and to understand their most critical impacts on the environment and the society. CSR aspects are divided into three areas. These three areas are: the economic area, the environmental area and the social area (see Table 1).

**Tab. 1: CSR aspects**

<b>Economic area</b>	<b>Environmental area</b>	<b>Social area</b>
Economic performance	Materials	Employment
Market presence	Energy	Labour/management relations
Indirect economic impacts	Water	Occupational health and safety
Procurement practices	Biodiversity	Training and education
	Emissions	Diversity and equal opportunity
	Effluents and waste	Equal remuneration
	Products and services	Non-discrimination
	Compliance	Collective bargaining
	Transport	Human right
	Supplier assessment	Local communities
	Grievance mechanisms	Anti-corruption
		Public policy
		Anti-competitive behaviour
		Customer health and safety
		Product and service labelling
		Marketing communication
		Customer privacy
		Compliance
	Supplier assessment	
	Grievance mechanisms	

Source: GRI (2017)

In order to meet the defined objective we have executed first the content analysis, then the comparative analysis (comparison of published information with the GRI recommendations) and then we have executed the synthesis of the acquired pieces of knowledge.

## **2 Results and discussion**

Companies active in the Czech market providing express courier services have been selected for this analysis. We have selected four companies that reported the highest sales in year 2014 and in year 2015. Only four companies were included into the research; the reason for that is to meet the requirement for the maximum length of the paper given by the organizers of the conference. These companies are the following companies: Česká pošta, s.p. (hereinafter CP),

DHL Express (Czech Republic) s.r.o. (hereinafter DHL), DB SCHENKER spol. s r.o. (hereinafter SCHENKER) and TNT Express Worldwide, spol. s r. o. (hereinafter TNT). Basic information about sales is presented in Table 2.

**Tab. 2: Sales in selected companies providing express courier services**

Company	Year 2014	Year 2015
CP	18 553 000 CZK	18 488 000 CZK
DHL	5 822 848 CZK	6 693 990 CZK
SCHENKER	4 558 273 CZK	4 813 517 CZK
TNT	2 484 929 CZK	2 460 512 CZK

Source: Česká pošta (2017), DHL (2017), DB SCHENKER (2017), TNT (2017)

CP provides a range of services in the area of processing information, payments and products both in the traditional manner and the electronic manner. It also guarantees the provision of universal postal services. Regarding express courier services CP offers service *Parcel Express* that is, under certain conditions, provided in the territory of the capital city Prague and in the capital cities of the individual regions (county towns). This service guarantees same day delivery to the addressee. CP communicates about its CSR activities primarily in its annual reports. Attention is given to employee care, to training programmes and to other educational activities, to sponsoring as well as to environmental protection (in particular in the area of emissions reduction). CP puts a lot of stress on the code of ethics, company values and cooperation with partner schools. For instance in year 2015 CP participated in a project focused on the prevention of breast cancer and melanoma.

DHL operates in more than 220 countries around the world and it employs more than 340 000 employees. DHL around the world offers express delivery services by means of air, road, maritime and rail transportation. It also operates in warehousing, packaging, international delivery of mail and parcels. DHL offers domestic express courier services with various delivery methods. This service represents delivery of urgent shipments on the same day, or on the following day or for less urgent shipments delivery on a pre-agreed day. CSR is presented as an essential part of the corporate strategy. In agreement with the motto of the company “Living Responsibility” DHL focuses on environmental protection, it provides support in natural disasters management, it supports education and voluntary activities.

Company SCHENKER operates in 140 countries around the world. It provides integrated logistics solutions and it offers global forwarding services. It operates its services on international level and it provides road, rail, air, maritime freight. In the Czech Republic it has

been active for 25 years in all regions. Regarding express services it offers express pallet transport around entire Europe. The shipment uploading is done in any Czech Republic place within two hours from order generation. The company strategy declares to strive for sustainable business from the economic and the social, but also the environmental point of view. In the environmental area it focuses on emission and noise reduction and on efficient use of natural resources.

Company TNT operates in total in 61 countries. It delivers goods and documents around the world. TNT focuses on express delivery. In this category it provides a couple of services. Service *Express* guarantees delivery of urgent shipments on next day, service *Special services* on the same day and service *Economy express* provides delivery of less urgent shipments while customers can order an exact delivery time. Another express service is *Night express*. Thanks to this service shipments can be delivered over night. This service uses night boxes so the recipient of the delivery does not have to be present in person. CSR is presented as an essential part of the corporate strategy. This company focuses primarily on health and occupational safety of its employees and on environmental protection where it focuses on CO<sub>2</sub> emission reduction.

Table 3 summarizes the results of research in accordance with the aspects of CSR to which the selected companies give attention on their web pages. It is obvious that these are the aspects considered important by the companies from their stakeholders' point of view. The classification of the aspects falling under the individual areas is based on the GRI recommendations. In each area there are marked those aspects that are communicated on the web pages by the selected companies (although the level of detail and the level of complexity of the provided information vary).

It is clear from the results of this research that the selected companies see economic performance to be important. These companies inform external stakeholders about their long-term assets and about their current assets, about equity and about liabilities. They often provide detailed information about their economic results and about their cash flows. Two companies (CP and DHL) also pay attention to indirect economic impacts of their activities, they inform about the extent and the type of investments into infrastructure and into service support. The companies do not find it important to provide information that can be classified under the GRI recommendation as *Market presence* and *Procurement practice* areas information.

**Tab. 3: CSR aspects**

Aspects/Companies	CP	DHL	SCHENKER	TNT
<b>Economic area</b>				
Economic performance	•	•	•	•
Market presence				
Indirect economic impacts	•	•		
Procurement practice				
<b>Environmental area</b>				
Materials				
Energy		•	•	•
Water				
Biodiversity				
Emissions	•	•	•	•
Effluents and waste				
Products and services		•	•	
Compliance				
Transport				
Supplier assessment				
Grievance mechanisms				
<b>Social area</b>				
Employment	•	•	•	•
Labour/management relations				
Occupational health and safety	•			•
Training and education	•	•	•	•
Diversity and equal opportunity	•	•		
Equal remuneration				
Non-discrimination				
Collective bargaining	•			
Human right	•			
Local communities	•	•		
Anti-corruption	•			
Public policy				
Anti-competitive behaviour				
Customer health and safety				
Product and service labelling				
Marketing communication				
Customer privacy	•	•		
Compliance				
Supplier assessment				
Grievance mechanisms				

Source: Authors

All of the analysed companies pay a lot of attention to environmental aspects and impacts. With regard to the business sector these companies are interested primarily in providing emission related information. Three companies (DHL, SCHENKER and TNT)

inform their stakeholders about consumed energy and they declare they strive to reduce energy consumption. DHL and SCHENKER pay attention to reducing the environmental impacts and they inform about measures taken to reduce such environmental impacts. None of the researched companies considers important to provide information about material consumption, about water management and waste management, about their influence on biodiversity, about compliance with environmental laws, about their supplier environmental assessment and about handling mechanism of grievance related to environmental aspects and impacts.

These companies consider the level of employment and training and education of their employees to be the most important social aspect. These companies understand the importance of their employees for the success of their business activities. They inform about the number of employees and about the company approach to employee education. Also from the additional provided information (related for instance to occupational health and safety, to diversity and to equal opportunities) it is clear they consider their employees to be important stakeholders from the CSR viewpoint. Local communities are also considered to be an important stakeholder in the CSR area by these companies. They pay attention to their activities' impacts on local communities and they present development programs. Two companies (CP and DHL) declare responsible approach to customer privacy data. All companies completely leave out social aspects: *Labour/management relations, Equal remuneration, Non-discrimination, Public policy, Anti-competitive behaviour, Customer health and safety, Product and service labelling, Marketing communication, Supplier assessment, Compliance and Grievance mechanisms.* Among the analysed companies it is CP that communicates the most about social aspects.

## **Conclusion**

It issues from the results of this research that the selected companies providing express courier services pay attention to CSR aspects. It is primarily their employees, their customers and their local communities who are the stakeholders addressed by CSR activities. In their communication, the companies stress primarily their economic performance, the management of their environmental aspects and impacts (mostly focused on emissions), company approach to employees and they declare efforts to co-operate with the local community. Given the significant development of e-commerce it can be assumed that CSR issues shall become more important for companies providing express courier services. This fact issues also from the Czech Republic's climate protection policy and from the objectives defined by the Czech Republic in the area of greenhouse gas emissions reduction (in the EU about one quarter of

greenhouse gas emissions is originated in the transport sector and the transport sector is the second most significant source of emissions). In further research attention should be given to a more detailed analysis of approaches and primarily to concrete CSR activities of individual companies providing express courier services. In the framework of this research it should be further researched if CSR aspects seen as significant by companies are also considered significant by relevant stakeholders in the context of their environmental and social impacts and specific features of the given business sector.

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## SUSTAINABILITY INFORMATION FROM SWEDISH TOURISM COMPANIES – WHAT, WHERE AND FOR WHOM?

Anna Sörensson

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### Abstract

**Purpose:** Within the tourism industry, there is a considerable focus on sustainable tourism. One way for tourism service providers to address these issues and present their sustainability work is through annual reports, sustainability reports and homepages. Sustainability report is a way for tourism companies to be more legitimate and accountable toward their stakeholders. The research objective, with this study, was to investigate and analyze Swedish tourism service providers' sustainability information. What kind of sustainability information is presented? Where is the sustainability information presented and for whom?

**Design/methodology/approach:** The data for this study was collected mainly during December 2015-February 2016. The research design was constructed as a qualitative explorative study on tourism companies and how they present their work with sustainability (economic, social and environmental) for their stakeholders. Data was collected from 50 different tourism companies in Sweden from their annual reports, sustainability reports and their home pages. They are large-sized tourism companies with a yearly turnover between 5-50 million euros.

**Findings:** The result shows that what they present is often focused on social or environmental sustainability (not both dimensions). The tourism service providers are all presenting economic sustainability since they must do an annual report yearly. Another conclusion is that they do not use sustainability report as their communication channel to show accountability and legitimacy to their stakeholders. Home pages are used mostly for presenting their sustainability work despite that there are large differences between how much information from the companies. The stakeholders seem to be mainly the customers.

**Research/practical implications:** It still seems like that many tourism companies do not see the benefits in sustainable tourism. If tourism companies want to be legitimate and accountable concerning sustainability they have the possibility to present more information about their sustainable information to stakeholders and conduct even more efforts on sustainability issues in their everyday business life. It would be interesting to make interviews to gain more insight in what they want to communicate to their stakeholders concerning their sustainability work. It would also be interesting to compare with other countries and culture concerning tourist companies' sustainability work and their communication to stakeholders.

**Originality/value:** The main value of this paper is that the study focuses on large sized tourism companies that must present a sustainability report from 2017. The European Union has decided to make it mandatory for large sized companies to present sustainability reports in 2017 and this study is therefore interesting since it shows their sustainability work before this law is implemented.

**Keywords:** sustainability information, sustainability report, tourism service providers, environmental sustainability, social sustainability

**JEL Codes:** JEL Q01, JEL Q55, JEL L83

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## Introduction

Sustainable tourism is nowadays well-established as an important research field as well as in the tourism industry. The real starting point came with the Brundtland Commission Report in 1987 but improvement and application has been slow within the tourism industry. An outcome from the Brundtland report was that companies started in early 1990s to show environmental reports. It continued with social reports in the mid-1990s. In early 2000, sustainability reports was presented that included all three sustainability dimensions (e.g. economic, social and environmental issues). *“Sustainability reporting is the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development”* (GRI, 2016). Research shows that the reasons for companies to make sustainable reports is not clear and differs between them (Mahoney, Thorne, Cecil and LaGore, 2013). The main reason why it is not that common with sustainable reports among companies might be because of an absence of clear framework. Among the companies that make sustainable reports it is differences concerning what they include. There are also companies that do sustainability reports just for “greenwashing” which means that the companies do it for their stakeholders and not to because they want to be more sustainable. Today, more companies present more information than just traditional financial accounting (Dumay, Guthrie and Farneti, 2010). Sweeney and Coughlan (2008) argue that sustainability reporting is used for several reasons like satisfy stakeholders, show accountability as well as legitimacy. It is also as a way of communicating with the company’s stakeholders. The trend is that more and more companies make sustainability reports. In 2007, the Swedish government decided that all state-owned companies had to make sustainability reports. They also decided that the reports should be based on the guidelines from GRI. The Global Reporting Initiative (GRI) is a framework for companies on how to create sustainability reports with focus on how a company influences from an economic, a social and an environmental perspective. The sustainability reports also had to be certified by an independent party the same way as financial reports. The idea was that the state-owned companies should be role models concerning social and environmental responsibility (Borglund, Frostenson and Windell, 2010). The European Union has decided through a directive that it will be mandatory for all companies that fulfils two of the following three conditions to present their sustainability reports. The first condition is that the company must have more than 250 employees. The second condition is that the company must have a yearly turnover over 35 million euro. The third and final condition is that the company must have assets of 17.5 million euro. Until 2017, and for companies that not

fulfils these conditions, it is still a voluntary act to make sustainability reports. Some countries and international institutions have created their own principles for how their sustainability reports should be structured and what it should contain. Among these principles and guidelines the most well-known is GRI (Dumay, Guthrie and Farneti, 2010). It is problematic that companies can choose by themselves how they present their sustainability work since many do it for marketing and not for real evaluation. It is actually many different stakeholders like for instance employees, customers, suppliers, creditors and public authorities that determines the success of the company and they may all pursue different economic, social and environmental dimensions (Buchholz and Rosenthal, 2005; Laplume et al, 2008; Dilling, 2009; Hahn and Kühnen, 2013). It is therefore, with the help of sustainability reports, that companies can present sustainability information with the aim to increase transparency, improve brand value, reputation and legitimacy, and motivate employees and contributing to corporate sustainability (Lozano and Huisingh, 2011). The research objective, with this study, is to investigate and analyze Swedish tourism companies' sustainability information. The research aim will be further explored through the following research questions:

*RQ1: What kind of sustainability information is presented by tourism companies?*

*RQ2: Where is the sustainability information presented by tourism companies?*

*RQ3: Whom are the stakeholders of the tourism companies that sustainability information are created for?*

## **1 Literature review**

### **1.1 Sustainable reporting**

Garrad and Fyall (1998) state that despite that sustainable tourism is a well-established research topic there is not yet one common definition. From this perspective, it is interesting to explore the field of sustainability reporting and how this field could be more adopted by tourism companies. As previous mention, GRI is the most frequently used guideline within sustainability reporting. There are other organizations that tried to standardize but still GRI is most used. GRI is a non-governmental organization that was founded in 1997 with the aim of helping companies to make sustainability reports (e g economic, social and environmental). Elkington (1997) state that it is important for companies to integrate social and environmental

dimensions to their business. The triple bottom line focus on the three dimension of sustainability; economic, social and environmental sustainability but uses the three P's instead (profit, people and planet). GRI is not a guideline that will be a one-size-fits-all-company but should rather be adjusted to the specific company. GRI also has two standards; core or comprehensive and depending on a company's needs it should choose the best fitted among these but also think of their stakeholder when choosing. GRI (2016) believe that it is not the quality of the report that should be in focus, nor either the company's performance but rather the degree of applied guidelines. It is the stakeholders that the company should keep in mind and make sure to report relevant information to them. The framework of GRI can be summarized in this simplified model:

**Table 1: The sustainability dimensions of GRI**

Sustainability reporting (GRI)		
Economic	Social	Environmental
Economic results	Employment	Material
Market presence	Relation between employees and management	Energy
Indirect economic impact	Health and security in work	Water
	Education	Biological diversity
	Diversity and equality	Emission (air, water and waste)
		Products and services
		Compliance
		Transport
		Investments for environmental protection

Source: Sörensson and Jansson (2016, p. 106).

## 1.2 Legitimacy

Legitimacy is the relation between the company and the surrounding society. The company strive to follow socially constructed norms and values that exist in the community to achieve legitimacy and therefore gain existence from the community (Deegan, 2002). Suchman (1995, p. 574) defines legitimacy as “*a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions*”. It is therefore important for companies to gain acceptance by the society for its actions (Suchmann, 1995). The problem is that norms and expectations might vary in different regions and it is depending on the community. It is the community in which

the company operates that decides what is needed to reach legitimacy. Research has shown that companies that is not perceived as legitimate has problems to last on the market (O'Donovan, 2002). It is not enough just to follow the norms and values that exist today in society, companies must also keep an eye on changes in the surrounding environment and adapt to maintain its legitimacy. It is what society believe a company do that counts, not what is actually done. Research also show that some companies do sustainability reporting more as a symbolic act to gain its legitimacy (Hooghiemstra, 2000). Companies with low environmental performance might be affect by their legitimacy status (Bansal and Clelland, 2004). Suchmann (1995) argue that there are two different approaches to legitimacy theory. One approach is the strategic where legitimacy is seen as an asset and a competitive advantage. The second approach, the institutional, see legitimacy more as a core belief for the company. Previous research have shown that companies can create legitimacy and a good reputation among its stakeholders by issuing sustainability reports (Deegan, 2002; Lim & Tsutsui, 2012). It is often more important with what a company tell its stakeholder than what is actually done and therefore it is focused on marketing (e g green-washing or self-laundry) (Ratanajongkol, Davey and Low, 2006; Zavattaro, 2010; Lim and Tsutsui, 2012). Sustainability reporting for these companies is more a symbolic act with the aim to gain legitimacy from their stakeholders.

Media have a strong influence on what people think of different companies and this might be the reason for an increased level of annual sustainability reports (Brown and Deegan, 2012). For a company to gain more legitimacy they can change their behaviors or practice or even be in doing more symbolic activities, like for instance work with legitimate organizations or companies, so that they can gain legitimacy without changing the company's actual behaviors (Buhr, 1998). It is crucial to both gain and maintain legitimacy from stakeholders in society for successful companies (Dowling and Pfeffer, 1975).

### **1.3 Stakeholder theory**

Stakeholder theory can also provide insights similar to those of legitimacy theory gives and is a commonly used theory to try to explain why organizations working on sustainability reporting. It overlaps legitimacy theory since both focus on the company's interaction with society. One difference between them is that legitimacy theory focuses on the expectations of the organization meanwhile stakeholder theory focuses more on the social contract that exists between the company and its stakeholders (Deegan and Unerman, 2011). Different stakeholders have different desires and effects on the company based on their influence over the company (Porter and Kramer, 2011). They should therefore receive different information about the

company that could include sustainability reports. There are many different stakeholders to a company and often are they divided into primary and secondary stakeholders. Primary stakeholders are those of great importance for a company like shareholders, investors and banks. One should be aware that companies often have many more stakeholder of different importance like customers, employees, government and suppliers. It is therefore important with sustainability information that addresses the needs from all these stakeholders. It might be problematic since they may ask for diverse information. Therefore, the company must rank their importance and often it is the money that is most importance (e.g. earns the most money as possible). Different stakeholders might also search for information in different ways and in different places like annual reports, sustainability reports, homepages, media and printed materials. This has led to that companies have different information for different stakeholders in different places. Issues that the companies address can be profit, good working conditions, low prices, high quality, environmental concerns and social awareness. Some companies therefore use sustainability reports as a strategic plan to the stakeholders to show them a certain image. One difference is that the annual reports often focus on shareholders, banks and other credit actors meanwhile sustainability reports focused towards the customers. The customers are often seen as a secondary stakeholder groups after the shareholders (Dumay, Guthrie and Farneti, 2010; Waligo, Clarke and Hawkins, 2013).

#### **1.4 Accountability**

Accountability is also combined with legitimacy and stakeholder theory but focus on what companies are accountable for and what kind of information provides to stakeholders. The idea is to present dependable and trustworthy accounts to the company's stakeholders on their environmental and social accomplishments. Gray (2007) believes that it should be mandatory to present sustainability reports from an accountability perspective. As previously mentioned, sustainability reporting is voluntary for private owned companies but will from 2017 be mandatory for companies within the European Union if two of the following criteria are fulfilled: companies with more than 250 employees (1), a yearly turnover over 35 million euro (2) or total assets of 17, 5 million euro (3). Among accountability researcher the issue of voluntary or mandatory sustainability reporting is discussed. For those companies that do it voluntary it might be a competitive advantage but it will also cost to make the report. On the other hand, could sustainability reporting help both stakeholders as well as the company (Unerman and O'Dwyer, 2007). Gray (2007, p. 181) argues that: *"reporting almost never offers a complete picture of organizational activity, social responsibility reporting is exceptionally*

*selective, sustainability reporting, despite protestations to the contrary is yet to address sustainability and accountability is not discharged*". "The lack of regulation has been identified as a barrier to improving quality within the accountability literature arguing that while sustainability reporting remains a voluntary process, companies will not discharge accountability". Milgrom (1981) state that there is an information gap between companies and its investors. It will always be the companies that have more information about upcoming events and possible future performance (Healy and Palepu, 2001). The same knowledge gap might exist concerning social and environmental issues for the company. The company knows for instance its processes, products and wastes and have much more insight on its social and environmental behavior compared to its stakeholders. The company can therefore, since they are aware of all environmental significances, choose whether and how to spread this knowledge to their stakeholders. Among researcher this information asymmetry is seen from different perspectives. Some of them believe that the benefits for investors was a main reason for using environmental reporting as a strategy (Cormier and Magnan, 2003). Others have argued that information asymmetry could impact the quality of the reporting (Brown and Hillegeist, 2007; Healy and Palepu, 2001). If the quality is higher it will then also reduce the information asymmetry between the company and some of its stakeholders. To reduce an information gap there is a need for higher quality of the sustainability reports; another issue is than information asymmetry and sustainability reporting. The stakeholders that ought to read these reports may not be able to review the quality of it. Schaltegger (1997) state is that the knowledge is useless if the stakeholder does not understand its message. Companies must reduce the use of difficult language to make the information easy for the stakeholder to understand and it must also be relevant knowledge. It can be tough for stakeholders to value the knowledge and can therefore make wrong choices because of incomplete information (Schaltegger, 1997).

## **2 Method**

This study is part of a larger project that has resulted in different studies (e g papers with different approaches). The study was designed with a qualitative approach. The data was collected mainly during December 2015-February 2016. The explorative study focusses on different Swedish tourism companies and how they present their work with sustainability (economic, social and environmental) for their stakeholders. This paper is based on data from 50 different selected tourism companies in Sweden (e g hotels, restaurants and activity companies). The data collection took place in several different steps. The first step was to use

the homepage [www.allabolag.se](http://www.allabolag.se). This home page registers all limited companies in Sweden. At the homepage, I selected all companies that was categorized as hotels, restaurants and activity companies. These companies had to have a yearly turnover between 5-50 million euros (50-500 million SEK). The companies were sorted by size and I started with the hotels, restaurants and activity companies with the highest turnover. The reason why the study focus on larger companies is that the European Union decided in directive 2014/95/EU that larger companies within the EU must do sustainability reporting from year 2017. It is the guidelines from Global Reporting Initiative (GRI) that constructs the sustainable reports according to EU. I therefore find it interesting to study these tourist companies before it is mandatory to make sustainability reports. The 50 different tourism companies were studied in the following way. First the company's annual report was studied to investigate what sustainability information that was presented there. I also investigated if the companies had any sustainability reports and how this information was presented. Finally, I studied each company's homepage to see if there was any sustainability information there. All the data used for this study is therefore secondary data (e.g. written documentation from annual reports, sustainability reports and home pages). The data is therefore from many different sources. I used the GRI framework (table 1) to analyze the data with an interpreted approach.

### **3 Findings and discussion**

The tourist companies present little sustainability information to their stakeholders. All companies show their economic sustainability through their annual report which is mandatory. In the annual reports, about 20 % of the tourist companies mention social and/or environmental sustainability issues in their text. About half of them are mention their environmental sustainability work meanwhile the other half are mentioning social sustainability with focus on equality and cultural diversity. There is only a couple of tourist companies that address both social and environmental sustainability. They often just mention their sustainability work in a short sentence or two. The rest of the tourism service providers mention nothing in their annual report about social or environmental sustainability. The main stakeholder group for the annual report are the owner, investors and banks. It seems like these stakeholders do not focus on social or environmental sustainability dimensions, but just the economic (mainly economic results and less information about market presence and indirect economic impact). Only two tourism service providers have sustainability reports. These sustainability reports have extensive

information about the companies work with both environmental and social sustainability. All areas that are addressed in the simplified framework from GRI are mentioned.

The home pages present sustainability information in different ways. About half of the investigated tourism companies have some kind of social or environmental sustainability information on their homepages. I have identified three categories of tourist companies based on their sustainable information; strong sustainable voice (1), weak sustainable voice (2) and silent sustainable voice (3). The group categorized as “strong sustainable voice” are companies that have extensive sustainable information on their home page. There is both environmental and social sustainability issues that they address. These companies do often work according to some kind of ecolabel like ISO14001, “the swan” or “the green key”. The tourism companies are well aware of what kind of social and environmental issues that are a problem for their type of company (hotel, restaurant or activity company). Therefore, they present what kind of changes they have done and will do to become a more sustainable tourism company. Some of these strong sustainable talkers are focused more on one sustainable dimension despite that they are presenting information about both of them. This result is similar to previous studies that tourism companies seem to focus on one of the sustainability dimensions at a time (Sörensson, 2010; Sörensson, 2011). These tourism companies seem to gain legitimacy and accountability but is really focused on sustainable issues. It is not just a show but seems to be a real interest and they seem to be serious about sustainability issues.

The second group that are categorized as “weak sustainable voice” are presenting some kind of sustainability information on their homepages for their stakeholders. The information is often short without any kind of argumentation. They often focus on one dimension of some kind like that they serve fair trade coffee, social welfare projects for sick people, handicapped people or poor people. The social dimensions is not focused on employees but rather social actions of some kind. Environmental issues that are mentioned by this type of small sustainable talkers are often that they use local produced food, reduce, reuse and recycle in a larger extent. It seems like these companies are trying to gain legitimacy and accountability towards their stakeholders without any real effort.

More than half of the tourism service providers investigated in this study are categorized as “silent sustainable voice”. That means that they do not have sustainability information of any kind (despite the economic in the annual reports). The companies are all large sized with a yearly turnover between 5-50 million euros. The tourism companies seem to have the financial possibilities to work with the company to become a more sustainable tourism company in the

future. These tourism companies do not seem to be interested in presenting any sustainably information and they are probably not doing any real effort yet.

## Conclusion

The tourism companies that are included in this study are large. They have an annual turnover between 5-50 million euros so it seems like they have money. They have not yet seen the benefits of becoming more sustainable otherwise; all of them would be showing their stakeholders their sustainability work. There are three types of tourism companies that present different amount of sustainability information to their stakeholders (eg strong sustainable voice (1), weak sustainable voice (2) and silent sustainable voice (3)). Many of the tourism companies will in 2017 make sustainable reports since it will be mandatory for them. It is interesting to see that most of the sustainable information are presented on their home pages. It seems like the information are there mainly for customers. One could ask if different stakeholders should ask for more sustainability information from the tourism companies. It still seems like that many tourism companies do not see the benefits in sustainable tourism. If tourism companies want to be legitimate and accountable concerning sustainability they have the possibility to present more information about their sustainable information to stakeholders and conduct even more efforts on sustainability issues in their everyday business life.

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## STRATEGIC MANAGEMENT OF OPEN INNOVATION IN THE SERVICE SECTOR

Miroslav Špaček

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### Abstract

**Purpose:** The purpose of this paper is to design R & D strategy which is based on Open Innovation. Open innovation and open business models are believed to be powerful tools which enable companies to have competitive edge over competitors. Even if open access to innovation is becoming more popular within the innovation community, there are neither formalized guidelines nor “best practices” which would illustrate feasibility of this approach. Shortages of both scientific research and practical experience in this field are considered the gap which is filled out by this paper. The paper aims at providing guidance to practical application of these approaches.

**Design/methodology/approach:** Case Study approach as well as ethnographic research were chosen as appropriate research methods. Case study deals with strategic management of open innovation in the company operating in service sector, specifically in ICT sector. The service sector is a suitable choice for OI adoption because there is a lower demand to protect IP. To achieve the goals, the analysis of current company foothold was performed by means of contextual interview. The target group were top and middle managers and company specialists who were engaged in processes improvement and corporate strategy elaboration.

**Findings:** The findings revealed that the company in question suffered from suboptimum innovation performance. The rectification of shortcomings was rendered through Open innovation approach which was preferably executed on a strategic level. Structured process how to grasp Open innovation approach to be viable and functional from strategic point of view is proposed.

**Research/practical implications:** The paper identifies main shortcomings in innovation performance and offers remedial actions. Moreover, the paper makes an induction to the elaboration and implementation of R & D strategy based on Open innovation. It also indicates the way which future research of Open innovation should focused on.

**Originality/value:** Since the term Open innovation was coined by Henry Chesbrough in 2003, this concept is still under exploration. The main contribution of this paper consists in deepening applied research of Open innovation and providing clear practical guidance for the development of R & D strategy which involves attributes of Open innovation.

**Keywords:** Open innovation, corporate strategy, open business models, service sector

**JEL Codes:** L17, L25, L80

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## **Introduction**

The elaboration of corporate strategy became one of the challenges in current discontinuity environment. To keep on running sustainable company growth companies more frequently resort to the adoption of modern management practices which help them enhance competitive edge. Specifically, companies little by little abandon obsolete paradigm of closed innovation and organically incorporate principles of Open innovation (OI) into corporate strategy development (Chesbrough, 2011). The main goal of this paper is to lay grounds of corporate strategy which is based on OI. The main problem which was also the impetus for the elaboration of this paper was that the companies are still hesitant to put trust in OI. This was also confirmed by the outcomes of the research set forth in this paper. In conjunction with the elaboration of OI based R & D strategy following research questions were raised:

- a) Do employees and company specialists possess sufficient competences for the adoption of OI?
- b) Has the OI based corporate strategy identifiable benefits as compared to that based on closed innovation

## **1 Methodology of research work**

The research comes out of thorough literature search to identify and reveal key progress in Open Innovation management. In addition, ethnographic research approach was applied. In the simplest way, the ethnographic research can be defined as follows: “*Ethnographic research involves the use of various techniques for collecting data on human beliefs, values, and practices*” (Hume and Mulcock, 2004, p. xi-xxviii). In total 21 company employees were interviewed to find out what were the main shortages and key challenges for the strategic management of Open innovation in companies. This number of responders roughly complied with the bottom limit of responders defined by Creswell (2007). The questions which were raised referred to company’s innovation process, namely to the disclosure of its strengths and weaknesses, the role of R & D department in the support of innovation process, familiarizing employees with OI concept, and possible interference of external subjects with company innovation process. Moreover, the responders were asked to identify the areas for improvements.

Interviews were conducted among members of the executive committee, directors, partners, managers, and consultants. Interviews were conducted by one person to avoid ambiguous interpretation. The average duration of the interview was from 40 to 50 minutes. Interviews which were conducted in companies, provided the grounds for obtaining valuable feedback from employees who were directly or indirectly engaged in the implementation of

innovation program. In addition to the ability to directly approach key employees, other advantages tied with using interviews were identified. These benefits included the flexibility to choose questions throughout the duration of interviews and the possibility to focus on specific issues in deeper detail. However, the disadvantage of interviews is the loss of anonymousness and privacy of the respondents that can lead to misleading answers. For data processing, appropriate coding was used. The codes referred to key areas which were covered by interviews (weak points in innovation process, strategic focus of innovation, motivation to innovation, human resources preparedness to innovation, main obstacles to effective innovation process etc.). Interviews were conducted in three phases:

*1st phase* – initial interviews with employees and their management. The objective of this phase was collecting information about the functioning R & D department, employees' understanding and identification with innovation process, revealing advantages and disadvantages of innovation process.

*2nd phase* – this phase was aimed at manager interviews conducting, issues clarification, creating a picture about the entire innovation process.

*3rd phase* – was launched after the completion of OI strategy elaboration. The target group were company managers and specialist who were directly or indirectly involved in R & D strategy elaboration. The main objective of this phase was to receive a feedback and discuss advantages and disadvantages of the proposed corrective measures.

On the top of that the paper also uses case study for the practical demonstration of the feasibility of using OI in R & D strategic management. The company in question operates in ICT sector and OI approach was applied solely in R & D department.

## **2 Open innovation**

Open innovation (OI) is a new paradigm that was described for the first time by Chesbrough in 2003 (Chesbrough, 2003). Basic idea which stands behind this concept is that the company cannot omit relevant information, knowledge, or know-how, which were developed outside the company borders. Sharing and mutual exchange of internal and external technology base generates additional effect which may bring value to all parties concerned. It also pushes internal ideas through external channels outside their current business of the firm, to generate additional value. The OI paradigm can be understood as the antithesis of vertically integrated model of R&D (Chesbrough et al., 2013). OI is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of

innovation respectively (Chesbrough, 2011). In addition to Chesbrough a couple of other authors introduced their definition of OI which were consistent with Chesbrough's one. West and Gallagher (2006, p. 320) came up with following definition: "Open innovation means systematically encouraging and exploring a wide range of internal and external sources for innovation opportunities, consciously integrating that exploration with firm capabilities and resources, and broadly exploiting those opportunities through multiple channels."

OI therefore counter the paradigm of closed innovation. The point is that the companies were obsessed with the vertical integration of their R&D which meant to carry out complete research and development by themselves (Chesbrough et al., 2013). To achieve this goal companies had to set up basic research the result of which were transferred to applied or technological research stage where activities like prototyping or lead users' testing were performed. Furthermore, companies took charge in other closely associated R&D activities, typically in testing methods development, business model development or post-sales technical service. It was apparent that companies were not able to entirely develop their competences which were substantial for smooth passing the innovation through all development stages to perfection.

After Chesbrough (2003) has introduced the term and concept in his book, many researchers traced different concepts of open innovations back to previously introduced terms such as absorptive capacity, complementary assets and the exploitation versus exploration discussion (Huizingh, 2011). Busarovs (2013) summed up and explained Chesbrough's five main elements of OI which encompasses networking, collaboration, corporate entrepreneurship, proactive intellectual property management and R&D. Aforementioned five elements were subjected to reconsideration and interpretation by various authors.

Vallat (2009) broached the OI topic and complemented on original Chesbrough concept. She formulated a definition of OI which was based on three fundamental elements that looked like follows: *extensive networking*, *user involvement* and *open functional platforms*. She perceived networking in a broader sense. Based on her perception of OI, the companies should incorporate all the subjects which can contribute to successful innovation process into their networks. It typically dealt with industrial companies, organizations, academic institutions, research institutions, experts, end-users, and end-users communities.

This implied the increase in the proliferation of spill-over effects and boosting collaboration between subjects. In addition, this approach drew attention to total value creation. *User involvement* and *user centricity* represented significant part of OI definition proposed by Vallat. This opinion was endorsed by von Hippel who considered the end-user driven

innovation as the most important. Moreover, it increased social welfare as well (Huff et al., 2013).

The role of the user was fundamental for the success of entire innovation process. Innovation became a co-creative collaborative procedure between main subjects – firm (industry) on one hand and the end-user on the other hand. To enable effective execution of user involvement, *open functional platforms* had to be created. These platforms enabled capturing ideas and facilitated communication between consumers and firms. It was quite important for the company to be willing and conducive to the adoption of new ideas and technologies which came from outside the company. On the other hand, the company should support sharing its own knowledge with external subjects. New trends in the establishment of sharing platforms has been already detected. Newly established sharing platforms like *Innovation Exchange* and *CMNTY Corporations* are examples of OI market places and community co-creation platforms. In addition, OI was combined with the development of new business models to give rise to Open Business Models (OBM) (Chesbrough, 2006). These OBM are sometimes termed as *linked business models*. Within the scope of OI, OBM represented the tool that help boost company value and simultaneously identified the extent to which external knowledge transfer is beneficial for company success. The combination of OI and OBM created *innovation ecosystem*. OBM thus referred to the situation where the innovating company relied on its partner competencies to jointly create value for customers and share that value according to agreements which were negotiated prior to starting collaboration (Chesbrough et al., 2014).

Chesbrough (2011) also examined possible interconnection of OI with service sector. He indicated that the main obstacle to successful adoption of OI in service sector were companies' being trapped in product innovation. According to Chesbrough companies were too much absorbed in product innovation which prevented them from creation customer value out of accompanying services (Chesbrough, 2011). In addition, research outcomes of some authors supported a standpoint that OI had a positive effect on company performance (Chesbrough et al., 2014). The study performed by Cheng & Huizing (2014) showed that the execution of OI activities was tightly and positively correlated with all four dimensions of innovation performance which were new product innovativeness, new product success, customer performance, and financial performance. The impact of OI was not limited to an aspect of innovation performance; it positively affected a broad range of innovation performance indicators (Aloini et al., 2015).

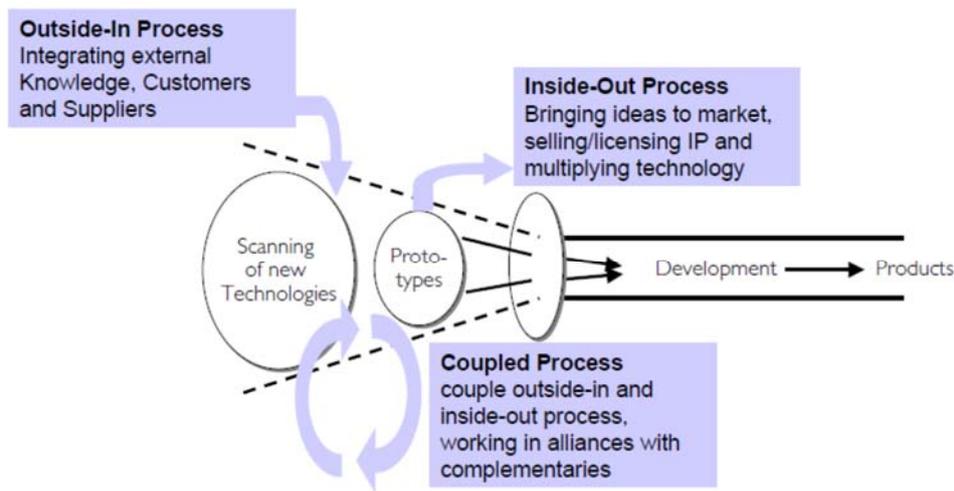
The research concerning the penetration of OI in the Czech industrial sector which was performed by the University of Economics research team proved that 61% of companies distrusted the concept of OI and would not intend to adopt OI in the near future. On the other hand, only 6% of companies were skilled and experienced users of OI. Such a discrepancy revealed the gap between well elaborated theoretical framework of OI and its adaption in management practice (Špaček & Hájek, 2015). The paper offered an induction how to manage OI on strategic level in service sector.

## 2.1 Process character of OI

One of the advantages of OI was that this concept closely observed modern process approach to company management. It was in conjunction with the shifting management paradigm from *entity-based* to *process-based* nature of the organization. Gassman & Enkel (2004) identified three underlying processes of OI. These processes encompassed outside-in, inside-out and coupled approaches to benefiting from OI. The adoption of OI was contingent upon meeting some requirements which referred to three dimensions which were identified as follows (EY OI readiness study, 2012):

- absorptive capacity - meant company ability to identify, accept and commercialize external information,
- corporate culture – represented the system of behavioural norms, values, and beliefs to be conducive to knowledge transfer,
- organization structure/methods – included mechanism for exporting and importing knowledge.

Especially the approach towards knowledge sharing was ambiguous. Companies strove to collect information in external environment and simultaneously prevented external subjects from benefiting on company's IP. This ambiguity was sometimes termed "*knowledge paradox*" (Bogers, 2011). If company wanted to embark upon OI, it was inevitable to cope with this paradox. The company preparedness to the adoption of OI might be audited so that unbiased view of company progress towards OI could be obtained. The system used measurable indicators that enabled mutual comparison of firms.

**Fig. 1: OI main processes identification**


Source: Gassmann, Enkel, 2004

## 2.2 Open innovation in service industry

A business, no matter if it concerned products or services offerings, could be conceived of as a series of processes that converted inputs into outputs through a series of specified activities or steps. These processes and activities may include contracting for supplies, management of technology process, establishment of inbound, outbound, and in-house logistics, quality assurance, human resources treatment, marketing and customer supplying etc. Over past thirty years these processes were preferably conducted by companies on their own. These practices eventually showed to be operated inefficiently. One of the reason was that companies partly resigned to the adoption of *economy of scale* principle. Economy of scale contributed to service innovation at two levels. The first level referred to the utilization of company assets which can be more economical if their value was spread among bigger output. The second level referred to the increased accumulation of knowledge if more transactions or uses took place. The latter case stood for the term *knowledge-based economy of scale*. Moreover, this knowledge-based economy of scale showed another important property. As opposed to fixed assets the use of knowledge didn't consume the assets or diminish its use for other transaction. The point was exactly opposite, any other use enhancing the knowledge advantage by a small amount. That is why it is sometimes termed as *non-rivalrous knowledge* (Chesbrough, 2011). The extension of innovation activity across company border thus promotes the adoption of economy of scale. Apart from *economy of scale* the concept *economy of scope* also plays an important role in innovation in service sector. *Economy of scope*, which are quite different from *economy of scale*, refers to the efficiencies that result from offering multiple items from a single source.

*Economy of scope* enable the firm to perform a wide variety of activities for its customers and very often with relatively low additional costs (Chesbrough, 2011). Utilization of company facility to produce many kinds of product can be set as an example. Gassman et. al. (2010) indicated that OI adoption by companies in service sector would become one of the nine leading trends concerning OI prospects.

Cheng & Huizing explored three possible types of strategic orientations which were combined with OI in the service industry: entrepreneurial orientation, market orientation, and resource orientation. They arrived at conclusion that clear-cut strategic orientation increased the effectiveness of OI. When comparing the three strategic orientations, entrepreneurial orientation strengthens the positive performance effects of OI significantly more than market orientation and resource orientation do. On the contrary, market orientation was shown to have a meaningfully stronger moderation effect than resource orientation. These findings provided an empirical evidence that contextual dependency of OI existed.

Namely an entrepreneurial orientation, which was tied with proactive and entrepreneurial processes was believed to create a vital precondition for the establishment of OI practice.

### **3 OI based strategy design**

SoftServices, Ltd. is a global ICT company which core business includes software development, software maintenance, technical and customer support. The company set up the second headquarter in Europe. The company provided customers with consultancy services as well. The company focused on three areas which were of strategic importance for the company. It dealt with UX design, Big data analytics and ICT security. Company strategy to be addressed in this paper was primarily aimed at R & D department strategy because of being more impacted by OI than other company departments. The focus of R & D department was the development of new products which were customized according to customer's request. R&D department closely cooperated with other organizational units to provide these units with new solutions, technology, and innovation.

The design of strategy described in this paper was oriented on R & D strategy exclusively. The reason was that so far almost no innovation process has been executed by R & D. Any attempts to innovate were rendered randomly and chaotically. Development of R & D strategy was a challenge. The special emphasis was placed on OI approach and its integration into overall strategy. Every component of the innovation strategy addressed a part dedicated to OI. The strategy covered three main dimensions and consisted of following parts: innovation

process, internal environment and supporting infrastructure. Each component was essential to a successful implementation and incorporation of changes. Detailed specification of three dimensions of R & D strategy are specified in Tab. 1.

**Tab. 1: Three dimensions of R & D strategy**

<b>Innovation Process</b>	<b>Internal Environment</b>	<b>Supporting Infrastructure</b>
Idea Creation	Culture and leadership support	Technology
Development and testing	Vision and Mission	Measurement
Commercialization		Funding
		Innovation Team

Source: own elaboration

### 3.1 Innovation process

Ideation phase which was usually considered of highest importance was a weak point. Generation of ideas in collaboration with external subject was supposed to be beneficial. Mutual flow of ideas intervening between internal and external partners generated bright and creative ideas that would have never come into effect solely in internal environment of the company. For the sake of facilitating exchange of information *Innovation box* was set up. Innovation Box was composed of two parts designed as internal and external. The former was used by the employees for presenting their ideas. The latter served individuals or companies that had reasonable interest in cooperating with the company to find solutions to specific problems. External partners may be customers, students, lead users, start-ups, NGOs etc. In the beginning, this approach could be tested by loyal customers, students, or other qualified volunteers. If it came off then more parties might be involved.

As pointed before, it was requirable to obtain feedback from within the company, but it was even more important to involve external partners into evaluation of innovative ideas and concepts. By this way unbiased external expert's opinions of the problem solution were obtained. Establishment of this practice as well as client feedback should be integrated into company's CRM system. Once the product was put on the market, it was essential to obtain feedback from customers to improve and modify key characteristics of the product to increase customers' value. This feedback enhanced the quality of the offer, adapted it to the market's needs and speeded up information flows from external partners. Feedback may be required from lead users, innovation communities or professionals. Obtaining feedback may be incorporated into company's CRM system.

### **3.2 Internal environment**

The company placed emphasis on the cultivation and continuous development of external relationships and opening R & D innovation process to external subjects. It was optional for the company to choose any of following ways:

- development of separate Open innovation strategy that would create a framework that ensured OI to be a part of company's DNA,
- identification of key external partners, establishment, and maintenance of close relationships to these partners,
- development of IP strategy and reaching common consent concerning the common approach how the department should deal with external knowledge.

The company also addressed the point which was often neglected. It was the establishment of OI culture, which was a big challenge not only for the R & D department but also for whole company. Generally, employees had no trust in OI techniques and they were afraid of sharing their ideas even with the peers on the workplace. Therefore, the company made a point:

- to intensify the collaboration between departments,
- to identify external parties that are potential partners for collaboration,
- to properly motivate employees to take part in innovation projects where external partners are involved,
- to elucidate employees on benefits and shortages of OI approach, namely about advantages which can be gained by open IP strategy,
- to increase the effectiveness of cooperation with external partners during entire innovation process (from ideation phase to innovation commercialization).

### **3.3 Supporting infrastructure**

Basically, OI process was closely tied with the involvement of external partners. Innovation Lead Team should be composed of persons with complementary competency profiles so that all the competences would be properly balanced within the team. It might include professionals, lead users or talented students who were passionate innovators. External partners provided the company with valuable inputs about the idea quality, potential interest of customers and overall concept. Specifically, line management with the support of HR department should oversee searching for innovation champions and innovation leaders.

Because researches in R&D Department did not get accustomed to adopting OI approach, it was inevitable to tackle stepwise process of the adoption of OI. Gradual involvement of OI techniques was psychologically more suitable for the perception of OI by

the staff. To begin with, it was highly recommended to begin with the usage of social media platforms, such as YouTube, LinkedIn, Research Gate, or Twitter. They represented a suitable communication channel which interlinked the company with external partners. The highest importance was to initiate discussions on innovations and attract innovators.

To measure effects of OI several non-financial metrics could be used. Typically, the number of external partners involved in every stage of an innovation process, the number of implemented ideas that were either proposed by external partner or influenced greatly by their feedback, the level of involvement of external partners into discussions and communication on social media platforms, number of visits, discussions, comments, likes etc.

## **Results and discussion**

The goal of this paper was to find a solution to ineffective innovation performance of the company's R & D department. The feasibility and effectiveness of OI adoption was demonstrated by case study taken from real business environment. The company in question eventually increased its innovation performance by implementing OI approach. OI approach was combined with the strategic management which enabled the company to consistently formulate R & D strategy. Such a strategy outplayed previous "closed innovation" based strategy which proved to be inefficient in current business environment.

Regarding the first research question it was confirmed that the employees were not properly educated and trained to challenge OI demands. It is a challenge for Academic institutions and Business Schools to either elaborate curricula on OI or use existing one and start to educate students and managers accordingly. Such a curriculum have been already developed within the project Open Innovation Network which was supported by the European Commission. As for the second research question, not only the research set forth in this paper but also researches performed by H. Chesbrough and other affiliated research groups obtained results which endorsed positive influence of OI on innovation performance.

Further research should be oriented on holistic exploration of OI based corporate strategies which would involve other functional or process strategies like marketing, operation, ICT, HR etc.

## **Conclusion**

The goal of the paper was to design OI based innovation strategy of R & D department of a ICT company. The strategy was split into three main areas: innovation process, supporting

infrastructure and internal environment. Innovation process is split into three phases: idea generation, product development and testing, and innovation commercialization. Internal environment accentuates the importance of leadership support to be prided by innovation leaders, department culture and the vision of the department. Supporting infrastructure covers specific areas as technology, controlling and measurement, funding, and innovation team.

The company then proceeded with the strategy implementation by means of Balanced Scorecard method. Each strategic operation was further detailed into specific actions, responsibility and budget being assigned. Both department managers and independent audit team control the fulfilment of strategic goals as well as meeting key milestones.

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## BUSINESS ETHICS IN CEE: ANALYSIS OF RESEARCH RESULTS

Włodzimierz Sroka – Richard Szántó

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### Abstract

**Purpose:** It is widely acknowledged that if a company wants to be perceived as a reliable business partner and a respected member of the business sector, it should demonstrate a high level of institutionalisation of business ethics principles and practices, and it must practice outstanding ethical behaviour. This is exceptionally true in some controversial industries. The purpose of our study is to identify the scale and scope of the use of these principles and practices in two Central European countries, i.e. Poland and Hungary.

**Design/methodology/approach:** In this study survey methodology was applied. The sample included a group of 48 companies operating in the pharmaceutical, tobacco and alcohol industries (25 Hungarian and 23 Polish ones). Our survey mainly focused on the degree of institutionalisation of business ethics (such as the presence of a code of conduct, an employee appointed to deal with ethical issues, ethical training, and so on), the perceived ethical behaviour of the firms, and their relationship with their key stakeholders.

**Findings:** Our study confirmed that business ethics is regarded as a significant factor, however the scale of this phenomenon varies, across both sectors and countries. The level of institutionalisation is somewhat higher at Hungarian firms, while preventing and handling corruption cases are more at the forefront of Polish companies. Yet, although it seems that stakeholders from Polish firms have greater ethical expectations, we did not observe significant differences between perceived ethical behaviour in the two countries.

**Research/practical implications:** Though the vast majority of the companies observed understand the need for ethical behaviour in business, the apparent unwillingness of respondents to participate in the study was observed. The results achieved may therefore be distorted to some extent. Regular studies, organised e.g. every 5-10 years in the sectors surveyed, would obtain stimulating data showing in which direction the companies from these sectors evolve. Additionally, further studies should be carried out with the participation of representatives of the enterprises surveyed (personal interviews).

**Originality/value:** The originality of the paper is the result of the presentation of unique quantitative research related to business ethics in sensitive sectors of the economy in two Central European countries. Sectors such as pharma, tobacco and alcohol are often accused of manufacturing questionable products or applying industrywide malpractices; therefore, observing their ethical principles and practices certainly provides significant fresh insights in this field.

**Keywords:** business ethics, ethical behaviour, Central European Economies, controversial industries

**JEL Codes:** A13, M10, O57

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## Introduction

Recently there have been numerous changes in the sphere of modern business operations. Globalisation, accompanied by rapid technological changes, has given rise to a completely new business environment. Under these new circumstances, the development of a modern company is determined not only by the effective use of resources and applying appropriate strategies, but also by taking into account the concept of business ethics in management processes. If a company wishes to be perceived as a reliable partner in business, it should implement elements of this concept, and indeed this concept itself (Sroka and Lőrinczy, 2015). In other words, companies are forced to maintain profitability and at the same time behave responsibly (Mohr et al. 2001). This relates not only to global corporations, but also to small and medium-size companies, operating in developed, as well as developing, countries and a variety of sectors functioning within. Given these facts, it is no wonder that many European and American business schools run business ethics programmes (Donaldson and Fafaliou, 2003; Jastrzębski, 2012), and growing interest in ethical issues has opened a market for the services of consultants and trainers (Van Liedekerke and Demuijnck, 2012).

Business ethics (also known as corporate ethics) is a form of applied ethics or professional ethics that examines the ethical principles and moral or ethical problems which arise in a business environment. It applies to all aspects of business conduct and is relevant to the conduct of individuals and entire organisations. Ethical behaviour and corporate social responsibility can bring significant benefits to a business. For example, they may (Lőrinczy et al. 2015):

- attract customers to the company's products, thereby boosting sales and profits,
- ensure that employees want to stay with the business, reducing labour turnover and therefore increasing productivity,
- attract more employees wanting to work for the business, thus enabling the company to hire the most talented employees,
- attract investors and keep the company's share price high, thereby protecting the business from takeover.

In contrast, unethical behaviour or a lack of corporate social responsibility may damage a company's reputation and make it less appealing to shareholders, leading to a fall in profits.

The term 'ethic' comes from Greek (ethikos – customary; ethos - custom). It can be defined as a theory of morality, which attempts to systematise moral judgments (Paswan, 2015),

or moral principles used in decision-making (Salehi et al. 2012). In the common sense of the word, ethics means the rules that determine whether behaviour is right or wrong.

Business ethics has a long history (Fischer and Lovell, 2009). A series of corruption scandals associated with companies such as Enron or WorldCom has changed the public perception of many entities. As a result of the scandals and abuses revealed, certain expectations relating to putting this theory into practice arose. Therefore, in the twenty-first century, business has been transformed: from the lack of accountability at the beginning, to high levels of ethical responsibility nowadays. It can thus be stated that business ethics is a scientific discipline dealing with the moral context of management and governance.

The term 'business ethics' combines two words: "business" and "ethics", which include moral principles, beliefs, values, culture, issues related to management and conducting business (Dimitriades, 2002). It is widely believed that business ethics is essential for today's managers. As Jamnik (2011) claims, "managers face ethical issues at work every day. It is rare for their decision not to concern the ethical aspects". There are various definitions of ethics in business in the literature, but the vast majority of them focus on the moral acceptance of the actions undertaken by the managers and employees of the organisation (De Cremer et al. 2011). Generally, it can be stated that business ethics explores and uses moral values, principles and standards that define and control the behaviour of participants in business at all levels of economic life.

It should be emphasised that the importance of business ethics will grow (Sroka and Hittmár, 2016: 254), of which there can be no doubt. It is even believed that the company should create a climate conducive to ethical behaviour; otherwise profitability will decline (Salehi et al. 2012). If a company wants to be perceived as a reliable business partner and a respected member of the business sector, it should demonstrate a high level of institutionalisation of business ethics principles and practices, and it must show outstanding ethical behaviour. This is exceptionally true in some controversial industries, such as pharma, alcohol and tobacco. This is mostly due to their nature and influence on human being health. Given these facts, the purpose of our study is to identify the scale and scope of the use of these principles and practices in two Central European countries, i.e. Poland and Hungary, in three controversial sectors of the economy.

## **1 Methodology**

The objectives of the study were achieved on the basis of data gathered through online survey methodology. The questionnaires were submitted to the group of 200 companies operating in the pharmaceutical, tobacco and alcohol industries, 100 in each country. We received 48 questionnaires back from the targeted companies which is a 24% response rate (25 Hungarian and 23 Polish firms were included in the sample). All respondents were somehow related to business ethics or corporate social responsibility, but they represented different departments of their organisations. The relatively small size of the sample can be justified by the high level of concentration in these industries, i.e. the pool of the potential target companies is fairly small. Our questionnaire focused on 4 topics: (1) which elements of ethical institutions were created in the organisation, (2) how relationships with certain stakeholder groups are managed, (3) to what extent ethical behaviour is supported in the organisation, and (4) we also wanted to explore the personal attitudes of the respondents towards business ethics, and ethical behaviour. A 1-5 Likert-scale was used for most questions (where 1 meant I totally disagree, and 5 meant I totally agree). In order to compare means across countries, the Mann-Whitney U test was applied (Mann–Whitney, 1947). It is a non-parametric test that is used to compare two sample means that come from the same population, and used to test whether two sample means are equal or not. Unlike ANOVA, Mann-Whitney is a distribution free method (Nachar, 2008), hence the two key characteristics of our sample – relatively small amount of observations and the lack of normal distribution of the variables – explained our methodological choice. (In the following tables, statistical significance on 5% was highlighted with \*\*, and statistical significance on 10% with \*.)

## 2 Results

**Tab.1: Ethical institutions in organisations**

	Hungary	Poland	Mann-Whitney U test	
	%	%	U statistics	p value
Code of conduct	79.2	<b>73.7</b>	215.5	0.676
Manager/employee responsible for ethics/CSR	59.1	<b>55.6</b>	191	0.824
CSR/Sustainability report	28.6	<b>43.8</b>	142.5	0.345
CSR/Sustainability is part of strategy	<b>82.6</b>	88.9	194	0.577
Clear processes to handle unethical behaviour	<b>87.0</b>	77.8	188	0.444
Rights guaranteed to report abuse cases	<b>86.4</b>	70.6	157.5	0.408
Clear regulations to avoid corruption*	52.4	<b>78.9</b>	146.5	0.082
Education about corruption	27.3	<b>47.6</b>	184	0.173

Source: own elaboration

We categorised ethical institutions based on how widespread these institutions were in the organisations we observed. We usually experienced that firms had clear processes to handle unethical cases, and they also had codes of conduct which regulate these cases in a more formal way in both countries. Significantly fewer companies appointed dedicated staff members to deal with ethical issues, and even fewer firms issue CSR/Sustainability reports (CSR reports might serve as a vehicle to report on ethical cases). In terms of ethical institutions, significant differences were found across countries only in the case of anti-corruption regulations. Polish respondents talked more often about these regulations than their Hungarian counterparts (education about corruption was also more widespread than in Poland, but differences were not statistically significant).

**Tab. 2: Ethical behaviour at the company**

	Hungary		Poland		Mann-Whitney U test	
	Mean	Std. Deviation	Mean	Std. Deviation	U statistics	p-value
Ethical behaviour supports success	<b>4.08</b>	0.91	3.76	1.18	228	0,422
Ethical behaviour and CSR will be more important in 2 years	3.73	1.20	<b>3.74</b>	1.29	213,5	0,864
Ethical behaviour supports higher sales	3.27	1.43	<b>3.42</b>	1.16	223	0,841
It is almost impossible to work fully ethically	<b>3.17</b>	1.19	2.95	1.16	218	0,567
Unethical behaviour is widespread at my company	<b>2.00</b>	1.29	1.76	1.10	252,5	0,811

Source: own elaboration

Some questions focused on the importance of ethical behaviour within the organisations. Our respondents – in both countries – were convinced that ethical behaviour supports success, and they do not really agree with the widely-shared assumption that success in these industries can be achieved only through unethical behaviour, or at least through some ‘dirty’ compromises. However, many people agreed to a certain extent that fully ethical behaviour was not possible in these organisations. These findings may seem to be contradictory, but as regards tendencies, there seems to be a fairly broad consensus that ethical (and socially responsible) behaviour is generally beneficial to the members of the organisation and to the organisation itself as well, and it will become more important in the upcoming years. It is also noteworthy that significant differences across countries were not found.

**Tab. 3: Ethical expectations and stakeholders**

	Hungary		Poland		Mann-Whitney U test	
	Mean	Std. Deviation	Mean	Std. Deviation	U statistics	p-value
Owners express what ethical behaviour is	4.25	0.98	<b>4.40</b>	1.10	208.5	0.395
Our company considers ethical concerns about marketing	4.17	1.20	<b>4.48</b>	0.81	224	0.463
Our company performs better ethically than competitors**	3.91	0.85	<b>4.47</b>	0.81	151	0.023
Our company sponsors local events, activities	<b>3.86</b>	1.22	3.09	1.61	176.5	0.115
Suppliers are ethically reliable*	3.71	1.04	<b>4.24</b>	0.94	177.5	0.075
We consider the ethical performance of suppliers	3.13	1.32	<b>3.67</b>	1.43	189,5	0,144
Our clients, customers express their ethical expectations	<b>3.04</b>	1.22	2.90	1.58	223	0,656

Source: own elaboration

We raised questions about the ethical performance of and relationship towards certain stakeholder groups (such as owners, suppliers, customers, etc.) in our questionnaire. We did not experience significant differences across the countries (as Table 3 shows) except in the case of competitors and suppliers. Polish firms in problematic industries are more convinced that they are superior to their competitors than their Hungarian counterparts, and they also believe more strongly that their suppliers are ethically reliable. In both countries, owners place equal emphasis on being ethical and primarily define ethical behaviour. Firms in these countries also try to apply ethical marketing initiatives. The relatively low perceived expectations from the customers came as something of a surprise.

**Tab. 4: Personal attitudes toward business ethics**

	Hungary		Poland		Mann-Whitney U test	
	Mean	Std. Deviation	Mean	Std. Deviation	U statistics	p-value
It is clear what being ethical means at work	4.64	0.49	<b>4.71</b>	0.56	235	0.449
Ethical considerations were important when starting work**	<b>4.24</b>	1.09	3.14	1.49	148	0.008
I am aware of regulations pertaining to ethical behaviour*	3.72	1.43	<b>4.35</b>	1.14	175	0.064
Regularly faced with ethical dilemmas at work	2.76	1.39	<b>3.00</b>	1.38	237.5	0.573
I have at times behaved unethically	1.52	0.77	<b>1.61</b>	0.86	249.5	0.744

Source: own elaboration

Although one may think that in morally questionable industries the meaning of being ethical might be somewhat less clear than in other sectors, we found that for respondents in both countries it is fairly clear what being ethical at work means. However, it seems that in Poland organisational regulations pertaining to ethical behaviour are more well-known to the members of the organisation, therefore Hungarian employees might gain this knowledge (i.e. how to behave in critical situations) mainly from other sources (through socialisation, role models, or in other informal ways). It is quite apparent in both countries that moral dilemmas exist in the organisations observed, but people in the pharma, tobacco and alcohol industries may not have many more such dilemmas when compared to other employees in other sectors. Basically, no one admits that he or she has behaved in an unethical way recently, which is probably not surprising: even allowing for the use of anonymous questionnaires, this is a highly sensitive question to which people usually respond in a positive way (it is also consistent with what we found at organisational level: most people rejected the idea that unethical behaviour is widespread in their organisation). Yet, our Hungarian respondents stated that, when they started

working in their organisations, they had strong ethical considerations – in Poland these considerations might be missing (or at least they are less solid).

## Conclusion

Our study confirmed that business ethics is regarded as a significant factor which has an influence on business success and the corporate image of companies from the sectors in question. However, it is necessary to emphasise that the scale of this phenomenon varies across countries. The level of institutionalisation is somewhat higher at Hungarian firms, while preventing and handling corruption cases come to the forefront more within Polish companies. Yet, although it seems that stakeholders have greater ethical expectations from Polish firms, we did not find significant differences between the perceived ethical behaviour in the two countries.

Our questionnaire included some sensitive questions on unethical behaviour where responses might have portrayed a more positive picture than the actual situation looks like in the controversial sectors observed. Therefore, further qualitative studies should be carried out in the future with the participation of representatives of the enterprises surveyed (i.e. personal interviews) in order to obtain more realistic results in this regard.

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## NEPOTISM AND FAVORITISM IN THE STEEL SECTOR: ARE THESE PHENOMENA PREVALENT?

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### Abstract

**Purpose:** The term ‘nepotism’, i.e. favouritism granted to relatives, is usually associated with corruption in the public sector and the abuse of public resources. Moreover, it is commonly accompanied by the public image of post-Soviet and/or developing countries. One may, however, observe the manifestations of nepotism in different sectors of the economy. Therefore, the aim of the paper is to analyse the main principles of transparent management of companies operating in the steel sector and deconstruct the myths of nepotism and favouritism.

**Design/methodology/approach:** Two research methods were used to analyse these phenomena: an analysis of widely accessible information devoted to anti-nepotism practices (the first stage), and interviews with the managers of steel companies operating in Poland (the second stage). The data collected during the first stage allowed us to analyse the problems associated with nepotism. Interviews (totally 18) with the managers allowed us to find out the real perception of this phenomenon and thus to determine the prevalence of these pathologies in the sector. Our research was done in Q4 of 2016 and included all steel companies (totally 9) operating in Poland.

**Findings:** Our research has confirmed that nepotism and favouritism are observed in the sector analysed. However, it is necessary to emphasise that the scale and range of this phenomenon vary, depending on the membership of three groups, i.e. global corporations, companies listed on Warsaw Stock Exchange, and small companies.

**Research/practical implications:** Our research has several implications. Firstly, it confirmed that the steel sector - like other industries - is not free of these pathologies. Knowledge of this fact may be useful for managers, and above all the owners of steel companies, allowing them to take the necessary preventive actions. Secondly, regular surveys organised in this sector (e.g. every five years) would facilitate the obtainment of interesting data showing how the situation has changed over time. And thirdly, the results of our research may be a good starting point for the formulation of the research hypotheses in further surveys.

**Originality/value:** The originality of the paper is the result of the presentation of unique qualitative research related to nepotism and favouritism phenomena in the steel sector. Another advantage is the fact that, to the best of our knowledge, such research is relatively rare (due to the sensitive nature of the topic) not only in Poland, but also on an international scale. It constitutes a significant addition to the value of this paper.

**Keywords:** nepotism, favouritism, steel sector, Poland

**JEL Codes:** M12, M19

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## **Introduction**

The term 'nepotism', i.e. favouritism granted to relatives, is usually associated with corruption in the public sector and the abuse of public resources. Moreover, it is commonly accompanied by the public image of post-Soviet and/or developing countries. One may, however, observe the manifestations of nepotism in different sectors of the economy, including traditional ones, e.g. steel industry. That's a very negative phenomenon which is influencing current economies. New knowledge-based economy of XXI century is mostly conditioned by the creation of innovations. And this, in turn, requires human resources, i.e. qualified and skilled people. Given these facts, every pathology - and nepotism and favouritism belong to this group due to its opportunistic attitude to HRM – have their negative influence of creating innovations, and thus – a competitive position of the company.

Nepotism and favouritism in this research are analysed as the forms of expression of internal corruption in non-governmental sector organisations, when decision-making is guided not by the objective criteria outlining the expertise of the employee, but by family relations (nepotism) or patronising employees for subjectively felt amiability (favouritism). In other words, in both cases, social connections are placed above the interests of the organisation.

Although developing countries undergoing political and socio-economic transformations often attract the attention of researchers, when analysing various manifestations of corruption in enterprises, including favouritism and nepotism (e.g. Safina, 2015; Bute, 2011; Wated and Sanchez, 2015; Wang, 2016), research shows that this problem does not have one "citizenship". Hooker (2009), emphasised that corrupting behaviour differs around the world partly because of different norms, and partly because cultural systems break down in different ways. According to the author, activities such as nepotism or cronyism that are corrupting in the rule-based cultures of the West may be functional in relationship-based cultures. In spite of the different cultures and norms, nepotism and favouritism in the Western countries remain, sometimes taking specific forms (Wong and Kleiner, 1994; Bozionelos, 2014). However, studies carried out in different countries show that these forms of corruption in organisations are inseparably linked with the level of tolerance or intolerance of society towards unfair behaviour, as a certain value transaction, which takes on specific forms revealed by the fact that it is impossible to fully utilise the potential of human resources or human resources are lost, that is, the "brain drain" occurs (Safina, 2015; Bute, 2011; Arasli and Tumer, 2008). It could be identified as a certain quiet, invisible opposition of the employees, resistance expressed individually because of the injustice experienced.

Two main, interrelated aspects of the impact of nepotism and favouritism on employees, not participating in these social networks marked by corruption, can be distinguished. Firstly, the stress experienced affects the employee's psychological and physical well-being (Bute, 2011; Arasli and Tumer, 2008). Secondly, and closely related to the first aspect, nepotism and favouritism negatively affect the performance of employees suffering from discrimination and their relationship with the workplace. Such reactions as declining job satisfaction and commitment to the organisation (Bute, 2011; Arasli and Tumer, 2008) cause dissatisfaction at work and lead to "word of mouth" dissemination of negative feedback about the organisation; when recruiting or promoting the priority is given not to the employee's professional competence, but to kinship relations, friendliness or on the basis of subjective benevolence to one or another person, it negatively affects the quality of human resources across the organisation as a whole (Safina, 2015; Bute, 2011; Vveinhardt and Petrauskaite, 2013; Padgett et al. 2015; Liu et al. 2015).

The dynamics of social relationships make the decision-making processes more complicated (Liu et al. 2015), and nepotism and favouritism in organisations are associated with a certain governance or leadership crisis (Bute, 2011; Liu et al. 2015). Social connections in some crony relationships, and apparently nepotistic ones, may add considerable value to organisations (Jones and Stout, 2015), but in any case, the use of social relations is linked to the professionalism and ethics of the manager. Therefore, such mandatory criteria for decisions made by leaders as objectivity, taking into account the employees' competences and merit, are emphasised (Karakose, 2014); in addition, clear norms and the responsibility for unethical actions are necessary (Wated and Sanchez, 2015; Wang, 2016). However, speaking about unethical decisions in favour of one or another person, the power ratio is ambiguous, because apart from the vertical relationship of the superior – subordinate, there is a horizontal relationship, that is, employee – employee, when they deliberately act (or not) to pursue the benefit by family connections or benevolence by relations for the person or persons concerned. Although nepotism and favouritism are often perceived as internal forms of corporate corruption, there is a strong discriminatory aspect to this phenomenon (Jones and Stout, 2015), when different employees are treated unequally because of purely subjective reasons. Given the deliberations presented, the research problem raised in the paper relates to the question of whether nepotism and favouritism are prevalent in the steel sector. The aim of the paper is to analyse the main principles of transparent management of companies operating in the steel sector and deconstruct the myths of nepotism and favouritism.

## 1 Methodology

The case study analysis concentrates on the steel sector in Poland and its players. The steel sector in Poland is divided into three main groups: 1) companies owned by foreign investors - this group is the largest and comprises several reputable global players; 2) companies listed on the Warsaw Stock Exchange; 3) relatively small steel companies, both public and private, whose share in steel production does not exceed 5%.

Our analysis was conducted in two phases. Firstly, the widely accessible procedures of the particular companies in each group (i.e. those which were presented on the websites of the companies) which were devoted to the anti-nepotism sphere were analysed. In the second stage of our research, we compared the results of the analysis with the results of interviews and discussions with the managers of the aforementioned companies.

Initially, during the second phase of the surveys, we planned to apply a semi-structured interview questionnaire consisting of 12 interview questions (questions were grouped into the following categories: factors related to the behaviour of the management, control and safety; factors related to the evaluation of the organization; factors related to the relations between employees; factors related to the internal policies and norms of behaviour of the organization; six questions were designed to identify the phenomenon of nepotism, and six – to favouritism). These categories correspond to the categories of the questionnaire developed for the quantitative research by Vveinhardt and Petrauskaite (2013).

Because of the sensitive nature of the topic, and informal information received from the companies analyzed that there will be no responses, a specific methodology of research was adopted, i.e. one question and face to face interview with managers of different levels. We asked them a question: *did you observe the phenomena of nepotism and favouritism in your company?* All the respondents who agreed to participate in the research work in managerial positions (mostly the highest one). All of them have higher education, the length of work in the companies analyzed is from at least 20 to 40 years. Totally, 18 managers representing 7 organizations took part in our survey (out of totally 9 steel companies existing in Poland). In order to get the real picture of the situation, we selected the group of managers on the basis of previous contacts and/or recommendations, ensuring them full anonymity; otherwise, it was a risk that the managers interviewed would want to present the situation in a better light. All interviews were done in Q4 of 2016.

## **2 Analysis of the research**

### **2.1 Analysis of the research in the first stage**

At the first stage of our research, widely accessible information pertaining to the steel companies devoted to anti-nepotism practices was analyzed. It was mostly related to the information and data presented at the website of the companies. The analysis made in the first phase indicates that: 1) no company has clearly stated that it has implemented anti-nepotism procedures (or even its assumptions); this relates to companies from all these three groups, however it was especially noticeable in the case of the second and third groups; 2) the larger the company and the higher the level of brand recognition, the more attention is paid to anti-nepotism and anti-favouritism procedures; and 3) on the websites of the companies listed on the Warsaw Stock Exchange, no links to the issues of business ethics were discerned.

### **2.2 Analysis of the research in the second stage**

#### **2.2.1 Companies owned by foreign corporations**

In contrast to the theoretical assumptions expressed on the companies' websites, the situation looks rather less healthy in practice. Due to its size, share and importance in terms of the steel sector in Poland (i.e. around 70-75% of the sector potential, grouping three companies, however, having several divisions), the first group was analysed most carefully. We asked 11 persons, however two of them refused. The results achieved were not satisfactory. For example, one of the respondents stated that four events of these phenomena were observed in 2016 only (all in the administration sphere) and out of these four events, one was related to the creation of a high-level managerial position in terms relative to another high-level manager (other two persons interviewed also reported "artificial staffing" (not mentioning, however, more details and other aspects). The next person claims that *"such phenomena and favouritism more specifically are observed in the administration sphere on a day-to day basis"*. Another respondent paid attention to favouritism towards foreign managers (especially representing the highest management level) from the company's HQ. As he stated, *"one always had an impression that local managers, irrespective of the vacancy, were not good enough to take these positions"*. Only the production sphere was free of these phenomena, and even then, only to a certain extent.

A very interesting result arose out of a discussion with one respondent who still works in the production department. Generally, he claims that it is necessary to differentiate between the administration and production/technical departments. In the latter, he observed no signs

and/or cases of nepotism. As he stated: *“the reason for this may be the fact that these functions require specific, technical skills and competences generally associated with steel production”*. On the other hand, he also observes a ‘wave’ of young, dynamic people in managerial positions, including those in the production sphere. Sometimes this brings somewhat negative effects (lack of experience and concentration on ‘tables’ only). Therefore, it confirms the thesis on favouritism. In contrast to the production sphere, he did not observe the signs of these negative phenomena in the administration sphere.

Another person also paid attention to some phenomena of favouritism which include both the administration and technical spheres. As he stated, *“they were hard to explain in essential aspects”*. These cases mentioned relate both to the creation of the new managerial functions (sometimes at a very high level) as well as promotion. The same respondent also mentioned some (though rare) cases of employing relatives, especially the children of high-level managers. In turn, another respondent working in administration underlined frequent cases of favouritism and some which were associated with nepotism, e.g. employing siblings. Certainly, it cannot be explained through the specific local environment (as was emphasised by some respondents from other groups).

Interesting results also arose out of a discussion with a former high-level manager. When he came to the company, it was already owned by a foreign corporation, which means that *“every aspect of functioning was standardised”* as he mentioned. He also paid attention to another situation, i.e. *“we the good guys, and they the bad guys”* phenomenon. In summary, he emphasised that the phenomenon of nepotism (though relatively rare) was observed in the company analysed. As for favouritism, his opinion was very similar: a somewhat low level of occurrence of this phenomenon, especially in the production sphere, was observed; in contrast to this, the administration sphere was much more exposed to such situations.

Finally, the last person from the first group we spoke to, to our surprise, did not see (and still does not see) any signs of these bad phenomena. In light of our previous discussions, we were very surprised with this point. The person was highly convincing, so there is no reason to doubt his analysis on the face of it.

### **2.2.2 Companies listed on Warsaw Stock Exchange**

This group comprises three entities located in the south of Poland (two of them with several divisions). As regards size, they are relatively small compared to the first group. Secondly, they operate in specific local environments. Sometimes, entire families have worked for the same company, however this is not regarded as an instance of nepotism so much as the result of historical circumstances. Thirdly, all the steel companies listed on Warsaw Stock Exchange

have a specific shareholder structure. Despite the fact that they are ‘public’ companies, they are owned by one (sometimes two) powerful strategic investors.

As one respondent who just left the company stated: “*one hears of relatively few instances of these phenomena*”; although some (very rare) events of this type were observed. He was unable, however, to provide more details. He remembered that there were situations in which the managers of subsidiaries were given ‘proposals and recommendations’ to employ some people recommended by the parent company. Such proposals were related to positions associated e.g. with finance and/or trade.

In turn, another one knew about instances of nepotism, albeit which took place several years ago. As he stated, “*the current stakeholder structure excludes the possibility of these negative phenomena as every shareholder looks at the hands of the other*”. He also added that another factor precluding these phenomena is the level of employment (very small), which means that there is no place for poor decisions regarding the promotion of employees.

The next person from this group also paid attention to an interesting aspect of promoting staff, i.e. recommended by the owner. These situations were related to different spheres and the highest management positions (mostly). Sometimes, the results achieved were not so promising, and a ‘frequent rotation’ of people was observed. As for nepotism itself as well as favouritism, the same person denied the existence of these phenomena in the company (there was also one more person in this group who had the same opinion). Favouritism of people recommended by shareholders was also raised by another person we spoke to. As was stated, those employees do not necessarily represent the highest skills and competences. The same person also claimed that nepotism is rather not prevalent.

### **2.2.3 Relatively small steel companies**

The third group comprises few relatively small entities (three companies, both state owned and private ones, with no divisions), especially when compared to the first group, and - to some extent – to the second one. When discussing with the managers, to our surprise, one respondent used even the term of “total nepotism”. When asked for more details, he stated that “*a lot of nephews, cousins or generally relatives were employed and artificial staffing is widely observed*”. It may, however, be a result of the specific local environment of the company in question. During a discussion of the details, it turned out that the situation is not as bad as it seemed. There were a number of family members working at the company, however, they had been there for several years. As for nepotism itself, it cannot rather be regarded as a classical

instance of this phenomenon (rather a ‘soft’ version). Such opinion was presented by all four persons from this third group.

In contrast to nepotism, there were some cases of favouritism towards certain managers. Such cases took different forms, e.g. acceptance of further work despite reaching retirement age, or (perhaps surprisingly) promotion to higher managerial positions despite not having sufficient experience and/or even skills from a certain field (it was also confirmed by another person from this group we spoke with). It is necessary to underline here that it is not a case of the person being irreplaceable; it is rather a pure instance of favouritism.

### **3 Discussion**

The analysis made in the first phase allows us to state that the situation looks reasonably good in the first group. However, it looks worse both in the second and third group as no company has clearly stated that it has implemented anti-nepotism procedures or even its assumptions.

The results achieved in the second stage of our research shows that in contrast to the theoretical assumptions expressed on the companies’ websites, the situation looks rather less healthy in practice. One may see that there were some similarities as well as differences between the particular groups analyzed. Generally, when trying to summarize the discussions with managers from the first group of analyzed companies, each person we talked to (except one) had heard about certain instances of nepotism. Special attention was paid to favouritism towards young, inexperienced people (of both genders). Only one person from the first group we spoke to, did not see (and still does not see) any signs of these bad phenomena, which was really very surprising given the responses of the other respondents.

In turn, analysis of the responses of the managers from the second group allows us to state that the situation is similar to the one existing in the first group. There were some (unless relatively rare) cases of nepotism and favouritism phenomena in the companies analyzed. One has an impression, however, that there are less such negative phenomena compared to the first group. Another reason may be the fact that this group is much smaller and comprises three companies only.

And finally, the analysis of the responses of managers from the last group indicates that the situation does not substantially differ from that which was observed previously. Though the cases of nepotism were not observed, respondents indicated that there were some cases of favouritism towards certain managers, which took different forms. Generally, the results of this

analysis, are generally worse than our previous surveys conducted in the sector in question devoted to bullying and harassment (Vveinhardt & Sroka, 2017).

## **Conclusion**

The aim of the paper was to diagnose the prevalence of nepotism and favouritism within the steel enterprises operating in Poland. The study was based on an analysis of the literature (assumptions of anti-nepotism procedures and practices) and a comparison with the situation existing in the steel companies operating in Poland (information available on the company websites, as well as interviews with respondents from those companies).

Prior to our analyses, on the basis of other studies and surveys, we assumed that the internal documents and procedures of those companies (and especially those which were presented on the companies' websites) would protect employees against nepotism and favouritism. The procedures available on the websites only partly confirmed this thesis: there are some companies which do not have any regulations of this type which may indicate that they use commonly applicable rules of law. In fact, only the companies which are owned by global steel corporations have some rules of this type on their websites (however, not directly related to nepotism and favouritism).

We claim that the results of our discussions with respondents from the companies operating in the sector analysed were much more interesting, even given the approach adopted. It was supposed that some single cases of nepotism and favouritism exist. Therefore, we were shocked to some extent when it turned out not to be the case. In other words, the steel industry is not free of these phenomena.

Our paper has several limitations, the first (and simultaneously the most important) of which is the methodology adopted. We fully realise the limitations of the method; however, we still believe that this allowed us to obtain a true picture of the situation in the sector. Moreover, it may be a good starting point to formulate research hypotheses in further surveys. Secondly, we undertook discussions and interviews with a relatively small number of managers (18). However, all of them were experienced (in some cases with more than 40 years in managerial positions, including the highest-level ones in different companies). This means that they were able to observe everything from 'inside'. After the discussions with them, we ceased further actions as the responses received were relatively similar.

Thirdly, we also believe that it would be beneficial to compare the situation in the sector analysed with the other industries (i.e. some kind of sector comparison) and would highly

recommend such a course of action. Though we concentrated on one sector only, one can assume that other sectors are not free of these pathologies. However, our research clearly indicates that the topic in question invites further surveys.

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## THE ROLE OF SENSORY MARKETING IN PRODUCT INNOVATION

Adriana Starostová

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### Abstract

**Purpose:** The recently established field of sensory marketing attributes its existence to customer demand for sensational experiences, among other things. Consequently, scent is acknowledged as an effective form of communication of the brand. This study focuses on olfaction, comparing consumer behaviour between scented and odourless products, aiming to address the question of how scent impacts the consumers' experience, offering recommendations to companies with regards to scented products. The study is relevant to all the enterprises that manufacture or develop their own product. The SME's can benefit through understanding the importance of scent and empirical insights about how scent impacts consumer's experience.

**Design/methodology/approach:** A Qualitative study has been conducted through the collection of primary data using two types of questionnaires, a-priori and posteriori of a tested product distributed to 100 participants with 89 % response rate which provides a sufficient basis for a good overview of many possible effects of scent. A subsequent stage of the investigation involved ten in-depth interviews which expanded on the subject. The study has been conducted over two months (March to May) at the University of South Wales in 2015. The participants were randomly selected students and staff of the university. All age categories and ethnicities were represented.

**Findings:** The results indicate enhanced (a) quality perception when the product is scented, (b) semantic associations with the scented product, (c) multi-modality of senses e.g. scent increases the desire to touch, (d) impact of scent on preference where the decision is not impaired by other factors such as availability or price and e) perceived favourability towards a hypothetical brand behind the scented product in some cases. However, where price was a parameter, the scent did not have an effect; presumably as aspects such as price and brand loyalty overshadow sensory aspects.

**Research/practical implications:** It is preferable to increase the range of products that stimulate consumers' senses. On the contrary, the cost is a determinant factor to consider before launching the product on the market as the price sensitivity can be quite high. The recommendation for companies is to diversify the portfolio and position scented products as more luxurious. Moreover, other sensory characteristics such as colour could be used in order to differentiate the purpose of the same product and facilitate multiple purchases. Other themes emerged such as the role of environmental aspects might be in some cases more important than the functional aspects.

**Originality/value:** This paper offers comprehensive overview of possible effects of scent on consumer experience. The study further indicates how scented products should be positioned and incorporated in brand portfolio.

**Keywords:** Sensory marketing, Product portfolio, Product innovation, Scent, Olfaction, Multi-modality of senses

**JEL Codes:** M31, O39

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## Introduction

This preliminary research focuses on domestic utility products – in this case plastic bin bags; and examines the behavioural change towards the scented product compared to the non-scented one. The product was selected because of its affordability in both of the versions, relative availability and easy manipulation when engaging potential participants of the study. It is also one of the products where scent does not pose a primary concern in selection, in contrast to e.g. perfumes or soaps. Despite increasing inclusion of scents in product development in practice, little to none attention has been paid to product scent as opposed to the scent in the environment in academic papers. Given that product’s scent has become viewed as an improvement on regularly odourless products, it appears important to explore consumer attitudes when exposed to scented products.

### 1 From experiential marketing to sensory marketing

It is important to introduce the recently developed term of sensory marketing which is defined by Krishna (2010) as *“the one that engages the consumers’ senses and affects their behaviour”*. A much broader definition has been formulated by Filser (2003) who clarified the role of a company in sensory appealing product creation and define sensory aspects of products as such: *“A group of key levers which are controlled by the producer and/or by the distributor to create a specific multi-sensory atmosphere around the product or the service either by focusing on sale outlet environment or product environment, ....”*

Achrol and Kotler (2012) summarized the key changes in the marketing paradigm (Tab. 1) and proposed a completely new direction that focuses on understanding consumer behaviour and orientation towards senses. Rather than pure service delivery, companies are trying to amaze their customers by novel approaches and enriched experiences. Instead of trying to only satisfy customer, today it appears essential to exceed customer’s expectations by attentional creation of sensory stimulants.

**Tab. 3: Key changes in the marketing paradigm according to Achrol and Kotler (2012)**

Received paradigm	Emergent paradigm
Consumer satisfaction	Consumer sensations and sense-making
Cognitive psychology of behaviour	Neurophysiology of consumer behaviour and sensory experiences
Products as “delivered services”	Products and services as sensory experiences

Source: Achrol and Kotler (2012)

Additionally, the concepts of customer experience and its management are at the forefront of the long-term focus of marketing. Schmidt (1999) specifies that experiential marketing (EM) can provide 5 different experiences and initiate potential actions: SENSE (provision of sensory experiences), FEEL (provision of affective experiences), THINK (provision of creative cognitive experiences), ACT (physical experiences, behaviour and lifestyles) and RELATE (experience of relation to specific social group or culture).

EM protagonists explain that a company does not have a choice to provide any experience; rather it has a choice to affect this experience in a positive way (Klaus and Maklan, 2007; Homburg et al., 2007). It has been demonstrated that the five senses affect human behaviour (Krishna, 2010; Hulten et al., 2009). This might be a reason why many international corporations resorted to sensory marketing, trying to stimulate consumers' senses. Examples of scent marketing include premium hotels signature perfume (Forbes, 2013; The Independent, 2011; Krishna, 2012), Revlon's scented nail enamels or Hollister.co using scents within their store environment. All of these tools have been acknowledged by companies as an effective way of communication (Krishna, 2010; Hulten et al., 2009). The Scent Marketing Institute (2011) confirms that across industries, businesses are increasingly adopting scent as part of multi-sensory marketing strategies.

Krishna (2012) claims that, through sensory marketing, subconscious triggers can be created and characterise consumer perceptions of abstract notions of the product (e.g., its natural sourcing or quality). The explanation of the scent power has origins in neuroscience, as only two synapses lie between the olfactory nerve and the amygdala which is commonly recognized for its role in emotion, also playing a large role in determining emotional memory (Cahill et al., 2000). Moreover, Hulten et al. (2009) points out that our senses play a crucial role in the emotional, aesthetic and sensory aspects in selection of a product, but there are also functional aspects that should not be overlooked. All the previously published studies focused on affirmation of these concepts, but have not utilised a specific product in order to describe the possible attitudes on scent. Regarding scent, there are some studies that tried to prove the role of scent in the environment in purchasing intentions, however many of them were criticised after publishing. Only the study of Krishna (2012) confirmed that scent has a link to the memory and hence that the scented product will be memorized better.

## **2 Research design**

### **2.1 Research philosophy**

The motive behind this study was primarily to investigate the changes in behaviour and attitudes towards the scented product which could not possibly be researched in such a wide scope when adopting quantitative approach to research. This approach is directly linked with the philosophy of epistemology when the researcher tries to describe how people perceive the world, thus how they perceive a scented product in comparison to the non-scented one.

Moreover, interpretive researchers assume that access to reality is only through social constructions such as language, consciousness or shared meanings. This approach examines the consciousness of the consumers related to olfaction and even though the perception does not always occur on the conscious level, it provides a superior insight to possible consequences for companies when incorporating scent (e.g. health concerns) which could make them more prepared for the public's attitude.

### **2.2 Research method**

A Qualitative 3 stages research has been conducted through collection of primary data at The University of South Wales, United Kingdom. During the first stage, 100 randomly selected participants were asked to complete a qualitative questionnaire. After returning first questionnaire, the participants obtained a product for testimonial – scented plastic bin bag with instructions for use which formed the basis for empirical experimental research. The second stage of the study required the same 100 participants to fill up another qualitative questionnaire about their attitudes towards the tested scented product. The third stage required 10 volunteers to participate in an in-depth interview with the author, which expanded on their answers to underpin the motives of their behaviour. The volunteers were between 20 to 65 years old students and university staff. The collected data were recorded, prescribed and grouped into themes by extensive coding process. One of the implemented research tools is Wordle, a free online accessible development which creates textual visualisations.

### **2.3 Research sample**

During all the stages, non-probability convenience sampling appeared to be the most adequate for generating the key emerging issues. Some researchers argue that probability sampling might not be always the best for qualitative study due to the generalisation of the population, when in contrast qualitative study is trying to understand the complex issues of human behaviour. The

selection of the sampling method can be justified due to factors such as limited time frame, financial constraints and no access to any database of clients. Moreover, this exploratory nature allowed the discovery of repeated behaviour patterns and hence to identify major possible outcomes of incorporating product scent. There was a significant effort paid to representation of all age categories, ethnicities and occupations (administrative staff, academics, students, employees of nearby restaurants and on campus shops etc.) to reduce bias with the proportional presence of students compared to other subgroups.

### **3 Product description**

The tested product is a plastic, non-biodegradable bin bag, black in colour; medium sized one with a light scent that could be associated with some citrusy fruit such as orange or lemon. Prior to testing, the selected product has been compared to other regular products available at major UK retailers in order not to possess significantly different product attributes.

## **4 Findings**

### **4.1 Initial Questionnaire**

The first questionnaire analysis revealed that although the most common answers stated that participants regularly buy *black, plastic bin bags*; some of them were very descriptive about the product they use such as detailed specifications about price, quality, material or colour. This illustrated that some consumers are conscious of their purchases even when the product's value is low. Moreover, repeated purchase intention for the consumers does not consist merely of functionality. The respondents clearly claim that there are other important aspects, namely appearance. Some use the colour to differentiate the purpose of the bin bags, some care about the environment and it is important for them to know that the product can be recycled.

One specific respondent was already familiar with the regularly used product's scent and described it as a lemon zest. Some respondents reported the desire to include scent on the product as way of innovation which demonstrates the progressivity of customers. Furthermore, a natural fragrance was preferred. This has implications for businesses, which should account for these attitudes. Neglecting the scents can decrease the ability to compete, however inappropriate scent could be reportedly harmful for the product.

Some participants were very sensitive about the money they spend and did not want to pay more than necessary, while others tend to invest more for better quality even when considering domestic utility products such as bin bags.

## 4.2 Post Experience Questionnaire and Interviews

The answers recorded in both questionnaires were used as a basis to explore during the 10 in-depth interviews. These were conducted in a conference room within the university premises in an informal way for approximately 60 minutes time-frame and moderated by the author. The interviewees were offered a free refreshment voucher for their participation. The answers were recorded, prescribed and the interviewers were asked to expand on the previously asked questions.

The second questionnaire highlighted that the scented product is expected to be more expensive compared to the regular product. This interestingly points out that scent might be a tool of positioning more luxurious products in the market. This is in contrast to the fact that the scented product is in the same price range as the commonly utilised products available across UK stores (Tesco, Asda, Lidl etc.). However, some participants thought that the product was also stronger compared to the one used regularly or had better appearance, suggesting that the scent has an effect on the participant's perception of price and quality.

Another theme expanded in the interview concerning the cost was whether participants would immediately order/buy the scented product once they run out of their domestic utility products and what might be the potential reasons why they would not. Some participants were enthusiastic about this innovative or original product whilst some of them would be happy with the product they are currently using mainly because the tested one was perceived as expensive. This indicates that scent might form a barrier in purchase for certain costumers.

The next question approached the consumer preference if the availability or cost would not play a role in the customer's decision. Except for one case, all the respondents would prefer to use the scented product regardless of the features concerning durability or size. Some participants showed enthusiasm about the assumed absorbent skills of the fragrance. Nonetheless, the sensitivity towards the price remains high and scent does not have the power to affect this, despite the fragranced product's clear favourability. This might also confirm that in some cases there is a contribution of scent towards the purchase intention. Moreover, when there are strongly represented other factors i.e. lack willingness to invest more; the scent itself is not persuasive enough for the consumers. In some cases, the added value might be connected to the belief that the product's scent poses additional qualities related to functional aspects such as neutralizing the odours.

The significant change of perception can be easily demonstrated through the semantic associations with the scented and odourless product identified from the sets of questionnaires

before and after the experiment; thus, illustrating the impact on the consumer's experience. The words were then analysed using Wordle. When the participants had to fill words that come to their mind first associated with regularly used product, the dominant words are mainly *rubbish* and other synonyms such as *garbage*, *trash* or *waste*. The next words are *recycling* and *colour*. Some words are also related to the functionality of the product such as *durability*, *handles*, *capacity*, *size* and *big*. Its sensory aspects play undoubtedly an important role— colour, packaging, material or smell. It can be summarised that the common association relates to the purpose of the product (*rubbish*), the environmental aspects (*recycling*) and finally the sensory aspects (*colour*).

Once participants tested the scented product, the most common association was *scent*, even though a significant change was observed also with other associations, i.e. *colour* and *black*. The word *rubbish* is no longer represented at all while only one participant connected the bin bag with *trash*. The associations were mostly positive, such as *elegance*, *nice*, *flowers*, *fresh*, *pleasant* or related to material i.e. *durable*, *absorbent*, *tough*, *thin*, *resistant* or *soft*. There was also represented some concern about the side effects of scent such as that it might cause a *headache*. In general, there could be seen an overall improvement of semantic associations which appear to be more positive when the product is scented and this can eliminate the negative associations connected to the product. Furthermore, a solely represented association *headache* warns from overload of sensory stimulation and confirms the importance of optimal sensory stimulation.

The answers related to the quality of the scented product showed that the scent factor contributed considerably to the decision that scented product equals better quality product with many of the respondents claiming that the scented product was the one of a higher quality despite its material being comparable or softer and less firm than regularly available plastic bin bags. Apparently, all the concerns over environment or the durability of the material previously expressed when asked about the quality of the regular product did not play a significant role. This illustrates that EM can add value to the product and also affect the perception of quality. Moreover, it provides further evidence for sensory manipulation and the contribution of scent to favourable perception of quality. Environmental aspects can in some cases outweigh the fear from rupture as one interview participant pointed out reflecting on the experience with the usually purchased product: “*Shape and material should be practical and fulfil the purpose. I use environmentally friendly bin bags which are made from recycled materials, but they are lower quality*”.

The next theme examined the attitudes related to the product's scent. For most of the participants, the scent was pleasant. However, in one case there was shown some level of sensitivity towards the fragrance when being constantly exposed in the same room; however this was eliminated by the light intensity of the fragrance. The participant expanded on this in the interview expanding on the role of scents applied on domestic utility products: *"I don't like any other scents than the natural ones. Nature smells the best to me. I hate synthetic fragrances as it just adds chemistry to your life."*

On the other hand, a common reasoning behind not using a scented product was the nature of the scent being *too strong* or *too sweet*. The description of the regular product's scent was, as opposed to the scented one, mainly unified – *plastic*. This demonstrates in practice that the company does not have a choice and product attributes always somehow affect the consumer. Interviewed participant compared the situation and showed enthusiasm about exceeding her expectations: *"It was like a subtle perfume which was far more pleasant than the non-scented version."*

The next question discussed the multi-modality of the senses; it questioned the participants whether they think that they handled the scented product more rather than the non-scented one. The results were mixed, with some respondents claiming that they did feel more like touching the product when the scent was present. There are studies (Carvalho et al., 2017; Wang et al., 2017) that one sense might trigger the other one and result in activation of behaviour under some circumstances and in some individuals; however, consciously reported behaviour might not show a significant desire to touch and the methodology would need to incorporate instore behaviour. Some interview participants consciously confirmed the increased desire to touch the product: *"I suppose I have touched the bag more times since it has extra attributes compared to regular product."*

Last question examined the attitudes towards a brand, clarifying which brand would be potentially perceived as superior. Some participants preferred the hypothetical brand behind the scented product, but some participants preferred the brand they regularly use e.g. one participant was a strong brand advocate with the specification of a brand Tesco which affected his choice: *"I believe that the product that I purchase from Tesco is the best value for money in terms of quality. I would not consider any other brand despite extra features."* This shows that some aspects such as loyalty to other brand might be superior factor to sensory aspects. However, the answers indicate that scent can promote products or cause favourability towards a hypothetical brand through selling more sensory appealing product.

## **Conclusion**

This study was conducted at the university and in the participant's own environment which might differ from the retailer's one and this might affect behaviour. Some processes might also occur on subconscious level and hence remain unexplored. Furthermore, the entire resulting themes should be investigated and validated further on a larger sample size which poses significant limitations to this study. The goal of the preliminary study was to identify oscillating concepts and potential consequences of launching a scented product for companies. It is not recommended to use scents extensively and in combination with many other sensory stimulants which might cause sensory overload and result in negative attitudes. The approach differs to other studies as the subject of testing was not a scent diffused in an environment, but scented product which is conventionally sold without an odour.

The study confirmed that scent has power to change semantic associations instantly, but more products need to be tested in order to validate the concept. However, this could potentially also enhance brand association and consequently increase the brand value. Interestingly, in some cases product's scent might subjectively enhance product's functional aspects by perceived power of neutralizing odours. One of the key themes that require further investigation is reported sensory manipulation when the attribute of scent had the power to shift the focus from functional to emotional attributes of a product. Last theme that emerged was that customer loyalty might be superior to sensory characteristics in some cases.

One key recommendation is that the product should not be replacing the existing odourless product, but expanding on the product range because of some participants are unlikely to be influenced due to their sensitivity towards scent that should not be overlooked. Similarly to the trend of healthy lifestyle and increasing environmental consciousness, focus is shifting from e.g. healthy ingredients, to naturally manufactured substances in fragrances. However, they are usually under the trademark protection and thus hard to estimate toxicity.

In light of the literature review, it is apparent that consumers seek the best value for money and if the company offers them additional product attributes for the same price, it might initiate their curiosity and facilitate purchase intentions. According to Kotler's model, the shift is over product's sensory attributes, but also environmental concerns as resulted from the interviews. Some identified concepts need further validation and verification.

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## JOB SATISFACTION IN THE CZECH REPUBLIC

Marek Strítěský – Václav Strítěský

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### Abstract

**Purpose:** The paper aims to identify overall job satisfaction in the Czech Republic and explore its differences between the various economic sectors. It also provides a comprehensive view of potential influence factors on job satisfaction with the emphasis on sociodemographic variables and job characteristics. This study aims to offer a different perspective on the issue of job satisfaction, which is often analysed in conditions of one specific organization. In the Czech Republic, a study analysing the global situation of job satisfaction in terms of sociodemographic variables have not been published yet.

**Design/methodology/approach:** The study is based on the quantitative research using personal interviews. Data was collected in cooperation with the research agency Median, s.r.o. within its research project Market & Media & Lifestyle. The size of the sample is over 15,000 respondents. Tests for the homogeneity of binomial proportions and logistic regression are used.

**Findings:** The paper provides a comprehensive view of job satisfaction on the Czech market. The influencing factors of job satisfaction are discussed. These results can be used when assessing the level of job satisfaction of various groups of Czech employees in terms of specific companies.

**Research/practical implications:** The paper includes implications for assessing the effectiveness of various HR policies on job satisfaction of various groups of employees in the Czech Republic. This comprehensive macro perspective on the issue of job satisfaction may lead to the conclusion that some socio-demographic groups of employees may generally exhibit lower level of job satisfaction regardless of the specific conditions of the company.

**Originality/value:** This paper provides a different perspective on the issue often examined in the conditions of Czech Republic, which is still missing and is frequently published in other countries.

**Keywords:** job, job satisfaction, HR policy, labour market, motivation

**JEL Codes:** M00, M12, M52

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## **Introduction**

Employee satisfaction is a crucial issue in the current business environment. The new situation on the labour market caused by the current phase of the economic cycle is the main concern of enterprises in Central Europe. Long-term challenge is the changing content of jobs, ranging from routine activities towards heuristic tasks. This fact significantly affects the value of human resources in business. Some researchers present the risk of a lack of specific qualifications in the labour market, which poses a challenge for businesses to reduce employee fluctuation and stabilize good staff (Bosworth, Jones, and Wilson, 2008). Other risks in this area stem from the overqualified workforce (Croce and Ghignoni, 2012). Both cases are also a reason to solve the problem of employee satisfaction.

Nowadays, many papers and studies deal with employee satisfaction and its factors. Some of the employee satisfaction factors are examined in the chosen sectors, such as banking industry, IT, public services etc. (Shan, Yao, Shi and Ren, 2014; Tso, Fai and Li, 2015). Other studies are designed in broader dimensions. They examine the impact of socio-demographic factors on the level of employee satisfaction in specific areas of working life (Urosevic and Milijic, 2012; Tomazevic, Seljak and Aristovnik, 2014).

In conditions of the Czech labour market only studies focusing on specific sectors or specific factors were published (Němečková, 2012; Sokolová, Mohelská and Zubr, 2016). Research on complex factors of employee satisfaction on the Czech labour market has not been published yet. The paper aims to identify overall job satisfaction in the Czech Republic and explore its differences between the various economic sectors. It also provides a comprehensive view of potential influence factors on job satisfaction with the emphasis on sociodemographic variables and job characteristics.

## **1 Data and methods**

Data for this analysis were collected in cooperation with research agency Median within the research project Market & Media & Lifestyle. Sample size is over 15 000 respondents. Data collection was based on personal interviews; random sampling was used. The sample is representative to the Czech population aged 12 – 79. Analysis for this study was focused on labour force. Some segments such as retired people, students, children, the unemployed were filtered out. Final sample size was 9 004 respondents. Data were collected during 4 periods in 2014.

Main part of the study aims to evaluate influence of sociodemographic characteristics and job characteristics on job satisfaction. Investigated variables are gender, age, education and net income as sociodemographic ones. As for job characteristics, economic sector in which the respondent works or does business, size of the company, status in employment, financial decision-making power and the type of employment (employee, entrepreneur) are investigated.

Based on data analysis, the paper seeks to answer these research questions:

1/ Which sociodemographic variables affect work satisfaction? 2/ Does job satisfaction differ depending on the job characteristics? 3/ Are the sociodemographic variables and job characteristics a reliable predictor of job satisfaction?

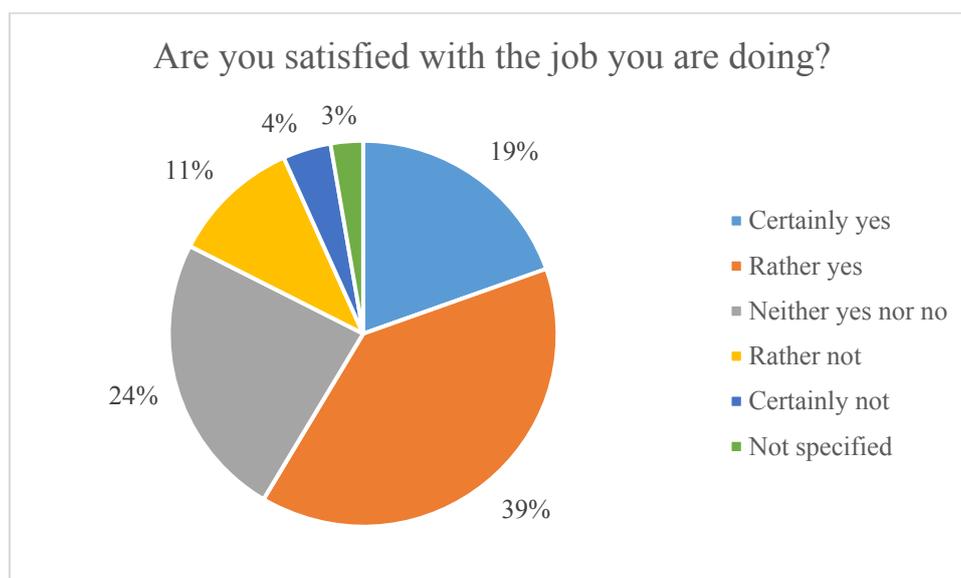
Significance of identified difference are evaluated through the tests for equality of means. Tests for the homogeneity of binomial proportions were used. Logistic regression is an additional method for assessing the significance of variables and their ability to predict job satisfaction.

## 2 Results

### 2.1 Overall job satisfaction

The research explored overall job satisfaction in the Czech Republic. Almost 60 % of Czech workers are satisfied with their job (see Fig. 1). It is relatively high rate of job satisfaction as only 4 % of Czech labour force are definitely unsatisfied.

**Fig. 1: Overall job satisfaction in the Czech Republic**



Source: authors, MML-TGI, Median 2014, N = 9 004

## 2.2 Analysis of sociodemographic variables

Differences between men and women are not statistically significant (p-value = 0,89). 58.6 % of male labour force and 58.5 % of female labour force are satisfied with their job. See Tab. 1.

**Tab. 1: Sociodemographic variables and their significance**

Variable	p-value	Significance
Gender	0.89	no
Age	0,00	yes
Age 16 – 24 vs. others	0.00	yes
Age 16 – 54 vs. others	0.00	yes
Age 25 – 54 vs. others	0.29	no
Education	0,00	yes
Net income	0,00	yes

Source: authors, MML-TGI, Median 2014, N = 9 004

Depending on age intervals definition the analysis confirmed age as a significant variable influencing job satisfaction. We can say that younger people are less satisfied with their job, namely people in the age of 16 – 24 (only 50.8 % are satisfied with their job compared to 61.7 % of 55+). On the other hand, middle aged people do not differ significantly in job satisfaction compared to other age groups (58.3 % of people aged 25 – 54 compared to 59.6 % of other people).

Education was identified as a significant variable. The higher education the higher rate of job satisfaction. Labour force with primary education has the lowest rate of job satisfaction (47.7 %). On the contrary, people with higher education have the highest rate of job satisfaction (69.1 %). Secondary education without graduation and secondary education with graduation were joined together as these two groups were characterised with similar rate of job satisfaction. In average, 57.5 % of labour force with secondary education are satisfied with the job.

Net income is a significant variable but the relation between job satisfaction and the size of net income is not linear as people with salary above CZK 100 000 are much less satisfied (61,4 %) compared to people with salary CZK 75 001 – 100 000 (96.8 %) or even CZK 50 001 - 75 000 (96.7 %). Despite this fact, the analysis confirmed that job satisfaction grows with higher income. Rates of job satisfaction for broadly defined intervals of net income are as follows:

- Up to CZK 10 000: 43.6 %;
- CZK 10 001 – 20 000: 55.8 %;

- CZK 20 001 – 50 000: 66.5 %;
- CZK 50 001 and more: 86.2 %.

The research identified net income CZK 50 000 as a breaking point of substantial growth of job satisfaction. 62.1 % of labour force with income CZK 40 001 – 50 000 are satisfied with their jobs compared to 96.7 % of labour force with net income CZK 50 000 – 75 000. These findings were important for defining the income intervals above. Dividing middle interval CZK 20 001 – 50 000 into smaller ones did not result in significant differences between them. Similarly, net income interval CZK 50 001 – 75 000 and CZK 75 000 and more.

### 2.3 Job characteristics

Next part of the analysis explored selected job characteristics and their relation to job satisfaction. Statistical significance of identified differences was tested by the test for equality of means. Analysed variables were as follows:

- economic sector in which the respondent works or does business,
- number of employees in the company where the respondent works,
- status in employment,
- financial decision-making power in the respondent's employment,
- type of employment (employee, entrepreneur).

One of the analysed characteristics was the economic sector in which the respondent works or does business. Tab. 2 presents the ranking of sectors per job satisfaction.

**Tab. 2: Ranking of selected economic sectors according to the job satisfaction**

1.	Education / Science	72.1 %	8.	Public administration / judicial / military / police	58.2 %
2.	IT	70.9 %	9.	Construction / Real Estate	56.9 %
3. - 4.	Other technical fields	68.3 %	10. – 11.	Banking / finance	56.8 %
3. - 4.	Marketing / Management / Advertising / Media	68.3 %	10. – 11.	Services / Tourism	56.8 %
5.	Health / Social Care	64.8 %	12. – 13.	Transport / Logistics	56.4 %
6.	Agriculture / Environment / Ecology	60.6 %	12. – 13.	Manual work	56.4 %
7.	Industry / production / extraction of raw materials / metallurgy	59.5 %	14.	Trade - buying and selling of goods	50.6 %

Source: authors, MML-TGI, Median 2014, N = 9 004

This variable is significant ( $p\text{-value} < 0,05$ ), differences in job satisfaction between particular economic sectors exist. Closer analysis did not prove significant difference among all the sectors. Some of them are similar to others. Economic sectors with significant difference in job satisfaction compared to other sectors are as follows:

- Health / Social Care;
- IT;
- Other technical fields;
- Education / Science;
- Trade - buying and selling of goods.

Next tested variable was the number of employees in the company which correspond to the company size. Overall, test for the homogeneity of binomial proportions showed a statistically significant difference ( $p\text{-value} < 0.05$ ). Biggest difference in job satisfaction was founded out between companies with 1 employee (generally independent entrepreneurs) and companies above 100 employees. 64.1 % of independent entrepreneurs are satisfied compared to 55.6 % in larger companies above 100 employees. Larger companies have similar rate of job satisfaction to companies of 6 – 25 employees (56.9 %). On the other hand, relatively high satisfaction was proven in companies of 26 – 100 employees (62.4 %). Relation between the company size and job satisfaction is not linear.

Status in employment is next significant variable which influences job satisfaction. Differences were statistically significant both at the 0.05 and 0.01 level. Analysis confirmed that job satisfaction is increasing with higher status in employment. Highest rate of job satisfaction was founded out among directors of the companies (94.6 %). On the contrary, lowest level of satisfaction stated ordinary (frontline) employees (56.5 %). Equal mean of job satisfaction (i.e., not significant difference of job satisfaction compared to other samples) was identified among managers with subordinate units (66.8 %). This status in employment does not imply statistically different job satisfaction ( $p\text{-value} = 0,08$ ).

Financial decision-making power showed as a significant factor, too. Generally, people with greater decision-making power in finance are more likely to be satisfied with their job. An interesting exception are people with the responsibility for highest budgets above CZK 5 mil. Their level of satisfaction is much lower and is not significantly different from other people (see Tab 3.).

**Tab. 3: Job satisfaction related to financial decision-making power**

Financial decision-making power	Satisfied with the job	p-value (binomial test)
Do not decide on financial flows	57.7 %	0,00
CZK 50 – 250 thousand	65.2 %	0,00
CZK 250 thousand – 1 million	68.9 %	0,00
CZK 1 million – 5 million	77.0 %	0,00
Above CZK 5 million	56.7 %	0,61

Source: authors, MML-TGI, Median 2014, N = 9 004

Last variable included in the analysis was the type of employment. Main aim was to identify difference in job satisfaction between employers and entrepreneurs. Aggregated data shows that private entrepreneurs are more satisfied with their job compared to employed people:

- Private entrepreneurs: 66.0 %.
- Employed people: 57.9 %.

The difference is significant at the 0.01 level.

Interesting findings offered an analysis of this variable in more detail (see Tab. 4). The highest rate of job satisfaction was identified among entrepreneurs without employees (i.e., independent entrepreneurs). On the contrary, least satisfied are part-time employees. Binomial test compared values of job satisfaction rate between selected category and the rest of respondents. As p-values in Tab. 4 show, only private entrepreneurs without employees and part-time employees differ significantly from the average satisfaction of other types of employment (at the level of significance 0.05).

**Tab. 4: Job satisfaction related the type of employment**

Type of employment	Satisfied with the job	p-value (binomial test)
employed / sole job / full time	58.5 %	0,77
employed / two or more jobs or employed and self-employed	54.5 %	0,13
employed / part-time or part-time	50.7 %	0,00
private entrepreneur (owner / co-owner of the company) without employees	67.4 %	0,00
private entrepreneur (owner / co-owner of the company) with employees	61.8 %	0,33
Other	52.8 %	0,14

Source: authors, MML-TGI, Median 2014, N = 9 004

## 2.4 Modelling of job satisfaction through logistic regression

Significance of variables described above was evaluated also through logistic regression. Main aim of this part of the analysis is to answer the question if sociodemographic characteristics and characteristics of the job itself can be used for modelling job satisfaction.

Dependent variable is an agreement with the statement that the respondent is satisfied at work. Independent variables are sociodemographic characteristics and characteristics of the job. They are as follows:

- age,
- education,
- net income,
- economic sector – education / science,
- economic sector – IT,
- economic sector – other technical fields,
- economic sector – marketing / management / advertising / media,
- size of the company,
- status in employment,
- financial decision-making power.

**Tab. 5: Outputs of logistic regression**

	Parameter est.	Std. error	Test statistics	p-value
Intercept	-1,15	0,17	44,7	0,00
<b>Independent variables</b>				
Age	0,10	0,02	16,5	0,00
Education	0,09	0,04	5,78	0,02
Net income	0,11	0,01	54,54	0
Sector – education / science	0,48	0,12	15,72	0
Sector -IT	0,42	0,18	5,36	0,02
Sector – other technical fields	0,42	0,16	7,39	0,01
Sector – marketing / ...	0,81	0,31	7,03	0,01
Size of the company	-0,05	0,03	4,34	0,04
Status in employment	0,19	0,05	14,19	0
Fin. decision-making power	-0,07	0,02	10,53	0

Source: authors, MML-TGI, Median 2014, N = 9 004

Counted levels of significance for each variable confirm the relevance of analysed factors influencing job satisfaction. Most of the factors are significant at the 0,01 level, education and size of the company at the 0,05 level.

Significance level for the model is 0,00. On the other hand, coefficient of determination is very low (0,02). It means that this model is probably not suitable for explanation and prediction of job satisfaction. Hard variables such as sociodemographic characteristics and characteristics of the job are not sufficient. Preliminary analysis of other models based also on lifestyle variables showed that this type of independent variables has much better potential to predict job satisfaction. Coefficient of determination was between 0,2 – 0,3. This could be a basis for further research in this field. Job satisfaction is probably determined by a complex system of variables and will be generally difficult to predict.

## **Conclusion**

The findings of this research can be used in designing incentive programs of businesses in the Czech Republic. Expected impact of individual actions and tools can be corrected just in the context of moderating factors of employee satisfaction.

Findings of this study confirm that Czech labour force is characterised by a relatively high rate of job satisfaction. Most of sociodemographic characteristics except of gender have significant influence on job satisfaction. Young people are more likely to be less satisfied compared senior people. Higher job satisfaction was also proved among labour force with higher education and higher net income. Net income of CZK 50 thousand was identified as a breaking point in job satisfaction.

As for job characteristics, this study has brought interesting findings. Economic sectors with the highest level of job satisfaction are education / science and IT. People working in big-size companies above 100 employees feel much less satisfied with their job as independent entrepreneurs. Relatively high level of job satisfaction was identified among people working at companies with 26 – 100 employees. The relationship between these variables is not linear. Status in employment was also identified as a significant variable. Especially, difference in job satisfaction between company directors and ordinary employees is of high range. People with greater decision-making power in finance are more likely to be satisfied with their job except of people dealing with budgets above CZK 5 mil. This responsibility decreases job satisfaction again. Very interesting findings resulted from the analysis of the type of employment. Generally, private entrepreneurs are more satisfied with their job than employed people. Highest level of job satisfaction was identified among independent entrepreneurs without employees. This fact can be used for intrapreneurship principles development and application in companies.

Logistic regression confirmed statistical significance for most of investigated variables. On the other hand, due to very low coefficient of determination, sociodemographic variables

and variables describing various job characteristics are not sufficient for predicting job satisfaction. Based on preliminary analysis it was found out that variables regarding work lifestyle and values are better predictors than sociodemographic and job characteristics. Factors influencing job satisfaction are probably hidden behind psychological characteristics of people. This hypothesis will be investigated in next steps of this research.

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## USING KOHONEN'S NEURAL NETWORKS TO IDENTIFY THE BANKRUPTCY OF ENTERPRISES: CASE STUDY BASED ON CONSTRUCTION COMPANIES IN SOUTH BOHEMIAN REGION

Petr Šuleř

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### Abstract

**Purpose:** Kohonen's neural networks are used for the creation of cluster analyses. Through these networks, we search for common features within a data set and then we interpret these, ideally with validity for the entire data set. The aim of the article is to conduct a cluster analysis on a data set concerning construction enterprises in the Southern Bohemian region. Accordingly, we will identify the basic variables common to companies that enter liquidation.

**Design/methodology/approach:** The data set includes financial statements and non-financial information (e.g. number of employees, business location) of the construction companies, all of which had been in operation from 2006 to 2015 in the Southern Bohemian Region. The data was organized into a table where one row contained information about one company in a particular year. Subsequently, Kohonen's neural networks were generated and company clusters identified. We then focused attention on the clusters of companies that were in a state of liquidation and results of comparison then showed which sorting characteristics appeared repeatedly in the clusters of the companies.

**Findings:** The Kohonen neural network was determined. After its application, we receive Kohonen's map. As a result, we have clusters of enterprises with the same characteristics. Subsequently, comparing the clusters in which there are companies in liquidation, we obtain the characteristics typical for companies experiencing difficulties.

**Research/practical implications:** The practical outcome are the identified variables crucial for the survival of construction companies in the Southern Bohemian Region. The companies will thus be able to focus on the key factors of their success, or the indicators of their eventual failure. Their management will therefore be more efficient and accurate.

**Originality/value:** The additional value is the use of neural networks and cluster analysis tools for predicting the possible bankruptcy of companies. The results in the form of identified key factors leading to the failure of construction companies in the Southern Bohemian Region also have their value.

**Keywords:** construction industry, Kohonen's networks, bankruptcy

**JEL Codes:** C45, G33

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## **Introduction**

Bankruptcy probably originated in the bank sector, as its name comes from Italian *banca rotta* meaning, broken bank. Whoever was not able to pay off their debts with money had to pay them off with their property or with freedom, including that of their family members. Later, when slavery was abolished, bankruptcy was legally redefined in all respects, personal bankruptcy, firm bankruptcy and state bankruptcy (Kotova, 2014).

Bankruptcy is a legal status (and legal proceeding) of an entity that cannot repay the debts it owes. The process begins with a petition filed by the debtor, all of the debtor's assets are evaluated and then they are used to repay a portion of outstanding debt. As such, bankruptcy offers a business a chance to start anew. The closure of a firm is not identical with bankruptcy but it may be a sign of such an inevitable termination. Because of this, the statistical number of bankrupted companies is not precise (López Iturriaga & Sanz, 2015). Head (2003) notes that, according to The Business Information Tracking Series, about a third of closed businesses in the USA were successful at closure. The very reasons for company failure are not as well documented as the reasons behind business success. Many researchers attempt to predict bankruptcy using various models, dependencies and variables (e.g. Nam, Kim, Park, & Lee, 2008, offered a model of discrete-time duration prediction incorporating temporal and macroeconomic dependencies employing time-varying covariate vectors to show unique financial characteristics of each company).

## **1 Kohonen networks**

Proposed by Teuvo Kohonen, these are a kind of topology-preserving self-organizing network or map. Generally, a neural network with real inputs computes a function  $f$  defined from an input space  $A$  to an output space  $B$ . A Kohonen network is able to cover the region of definition of  $f$ , tiling the input space in sub regions - charts or maps of input space. Like other neural networks, Kohonen networks learn to create maps of the input space in a self-organizing way. Kohonen networks arrange the computing nodes in one or more dimensional lattices. A possible drawback may be that, unlike other models, a numerical measure of the extent of the mapping error cannot be used and the network can build an internal representation of the environment. However, if used with other methods, Kohonen maps can provide additional visual insights into cluster groupings (Abdou, 2009).

## **2 Kohonen self-organizing maps and bankruptcy identification**

The ability to accurately predict business failure is a very important issue in financial decision-making. Forecasting or predicting financial crises of companies is a major research problem (Mulačová, 2012). Business bankruptcy can also have a significant impact on the economy of a country. Pure Kohonen maps are not as accurate as supervised backpropagation neural networks, as noted by Lee, Booth, & Alam (2005) in regards to the limitations and feasibility of the maps. Kohonen and Cluster analysis are still considered a partial solution and are not developed as far as to compete with hybrid neural networks. Kohonen maps are thus often integrated in more complex solutions, such as the Decision Support System Serrano-Cinca (1996). The numerous approaches and solutions to the usage of artificial neural networks in business were aptly summed up in the research of Tkáč & Verner (2016).

Kohonen self-organizing maps can be used to improve the temporal stability of the accuracy of a financial failure model. Séverin (2010), later in mutual research with Du Jardin, explored the noted map's potential in quantitative analyses and noted that most models are unable to precisely generalize data for estimation and prediction purposes if the data are collected over different time periods. They quantized financial situations over time into trajectories of Kohonen maps, and achieved a higher degree of precision (this method performed better when compared with survival analysis, discriminant analysis, logistic regression, Cox's method and a neural network). Usage of Kohonen maps is also efficient in the improvement of self-based reasoning and once the feature selection is finished, the growing hierarchical self-organizing map is employed as a cluster tool to divide the case base into smaller, hierarchical structured subsets (Zhu et al., 2015).

Self-Organizing Maps are successfully used for data mapping and their trajectories enable clustering and the visualization of bankruptcy tendencies, thus offering new insights in the patterns of bankrupt company development (Chen et al., 2013). On the other hand, they serve as a tool for prediction of future bankruptcy and many literatures propose such models (Chen, M.-Y., 2012; Wei-Yang, Ya-Han & Chih-Fong, 2012; Kaski, Sinkkonen & Peltonen, 2001). Research by Tsai (2014) proposed four different types of bankruptcy prediction models, all of them hybrid models, incorporating Self-Organizing Maps and k-means and three classification techniques, logistic regression, multilayer-perceptron neural network, and decision trees. The experimental results showed that combining Self-Organizing Maps (or k-means) with single classifiers provided the best prediction result and lowest errors. A combination of multilayer perceptrons and self-organizing maps to predict bankruptcy was also

employed with success by López Iturriaga & Sanz (2015) with accuracy of 96.15% in the detection of failures over a given period.

The aim of the article is to verify the possibility of using Kohonen's networks to identify enterprises going bankrupt.

A research question can be formulated on the basis of the aim: Are Kohonen's networks a suitable tool for identifying companies on the brink of bankruptcy? It is also appropriate to establish a second research question: Is it possible to determine the key indicators characterising bankrupting companies with the help of Kohonen's networks?

### **3 Data and methods**

The article will utilise the data of construction companies operating in the Southern Bohemian region in the years 2006 to 2015. Specifically, a data file obtained from the database Albertina will be used. Each record row of the data file will represent company information for one calendar year, or more precisely, marketing year. There will be data of financial statements, as well as the code CZ NACE (sectoral numbering of economic activities), location of company headquarters (according to the districts of the Southern Bohemian region), the year of the financial report and year of establishment of the company. Overall, there will be the 88 characteristics for each company.

In summary, 4114 record rows are available for the given period they will be separated into individual clusters with common characteristics. We will then identify the clusters in which bankrupting companies are located. In doing so, we distinguish two categories of such records. Businesses that will cease their activities in the current year will be marked with the characteristic "crash in given year." Businesses that will be going bankrupt within one year of the reporting period will be, in the years preceding bankruptcy, marked with the characteristic "crash in the future." The total number of records of businesses nearing bankruptcy is in file 171.

We will prepare the data in spreadsheet editor Excel of the company Microsoft. Information about a company from one year of its operation will be entered in each row. Subsequently, the file will be loaded into statistical software. DELL software Statistica, version 12, will be used to perform the cluster analysis. The Neural networks tool in the Data mining section will be used in particular. From the menu, we will select "cluster analysis". Here we will select the variables that we will continue working with in the analysis. We will determine whether the quantities are continuous or discrete. Quantities such as company location, the CZ NACE code, year of establishment and year of the financial report will be labelled as discrete.

The year of company founding points to the company's history, with its inclusion among discrete variables we declare that during the establishment, the environment from which the company originated could have played a role. By also including the year of the financial report among discrete variables, we are declaring that we are not treating company data as flows, but as functions of state. We determine the other quantities as continuous. Next, it is necessary to separate all cases into three groups - training (with which we create a model and conduct cluster analysis), testing (with which we verify the accuracy of the model), and validating (with which we verify the accuracy of the conducted analysis again). The data will be divided in the ratio of 70% in the training set of data, 15% in the testing data set and 15% in the validating data set. The seed for random selection will be set to the value of 1000.

We will set the topological length of the Kohonen network to 10. The width of the Kohonen network will be set to the same value. For training, repetition will be set at the value of 10000. Learning speed will be 0.1 at the beginning and 0.02 at the end. Network initialization will be normal. During testing, we will monitor the development of training errors and the development of testing errors. The result will thus be a neural network, Kohonen network and Kohonen map. To be more precise, the result will be the division of businesses into clusters according to their common characteristics. If the characteristics of bankrupt firms will not distinguish them sufficiently from surviving businesses, we will change two parameters - specifically, we will reduce the number of input variables (we will limit these to the size of fixed assets, current assets, equity, foreign resources, performance and economic result before tax) and increase the size of the topological grid to 100 x 100.

We will evaluate success not only with the absolute number of bankrupt enterprises in individual clusters, but predominantly with the share of bankrupt enterprises in the total number of enterprises in specific clusters.

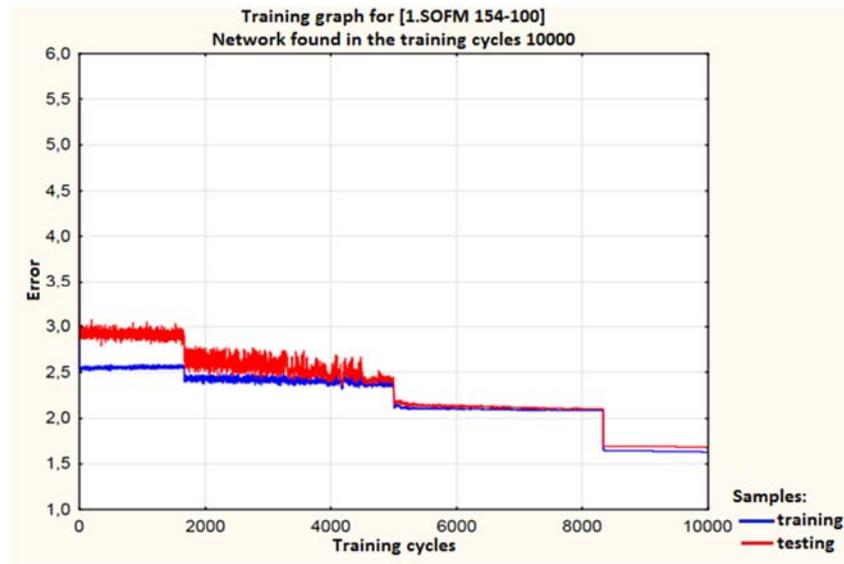
## **4 Results**

If the results are not reliable, several analyses will be performed.

### **4.1 Analysis number 1**

Figure number 1 provides an overview on the development of errors in the training and testing files, and the resulting error with which the cluster analysis is performed.

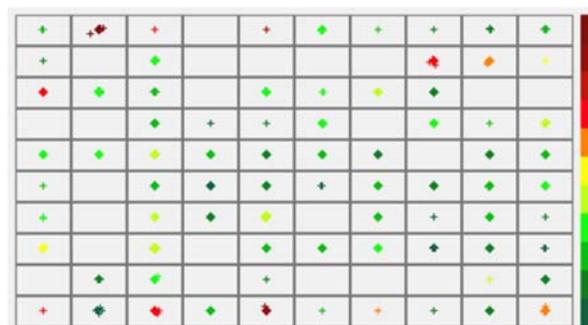
**Fig. 1: Development of error in training and testing sample**



Source: Author

On the basis of the first analysis, we obtain, with the help of neural network SOFM 154-100 (algorithm Kohonen 10000), the topological grid shown in figure number 2.

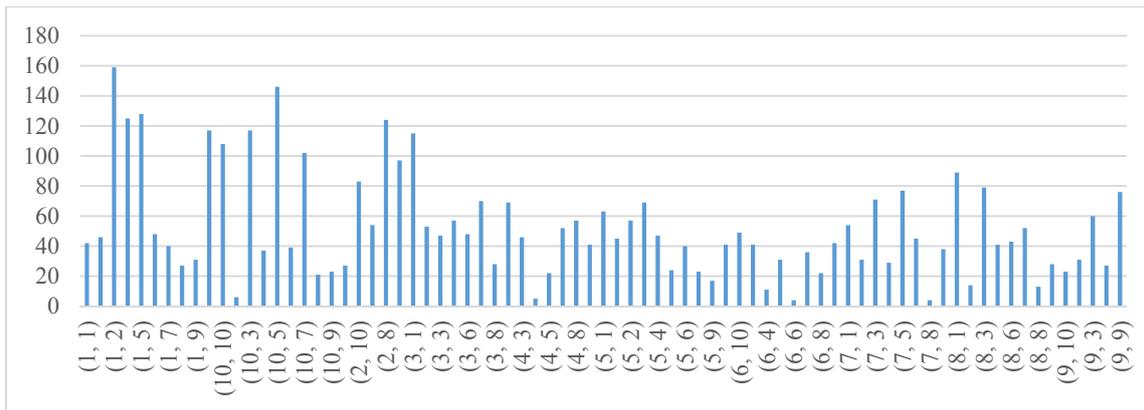
**Fig. 1: Topological grid of neural network SOFM 154-100**



Source: Author

From the grid it is obvious that some clusters are unoccupied (e.g., at position 1,4 or 2,4), and conversely, some are very numerous. The businesses most numerous represented are in positions 1,2 then 1,3 and 1,5. This is evident especially from the graph in Figure number 3.

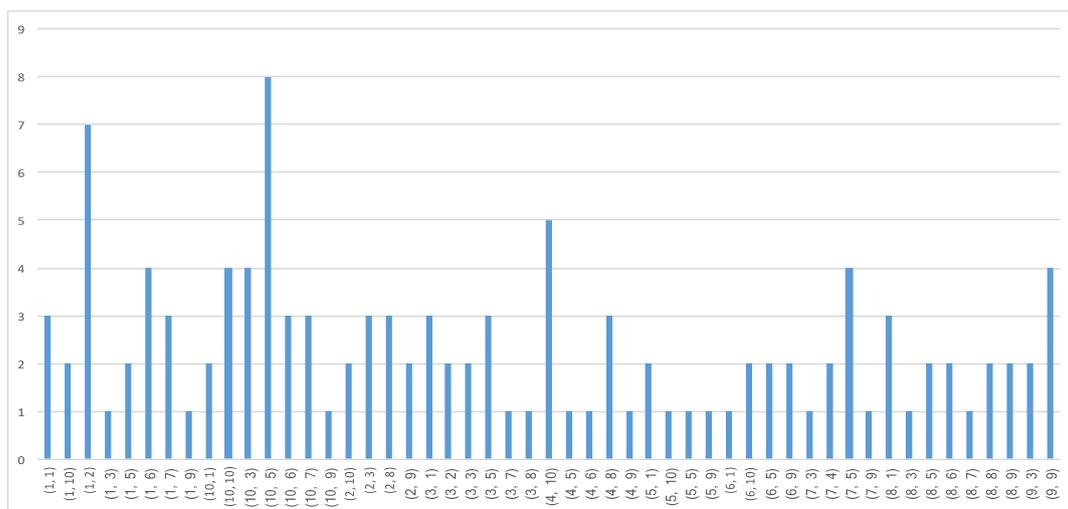
**Fig. 2: Frequency of enterprises in Kohenen's map SOFM 154-100**



Source: Author

For the result to be significant enough to meet the objective, bankrupt enterprises have to be significantly represented in a relatively small number of clusters. Figure number 4 provides a comprehensive description of the situation, i. e. the representation of companies that have gone bankrupt in the given year in individual clusters. From the graph it is clear that we have data available on 120 companies that have gone bankrupt in the current year. These 120 companies are represented in 51 clusters. The largest number of businesses that have gone bankrupt in the current year, namely 8, is represented in the cluster 10,5. This is followed by cluster 1,2.

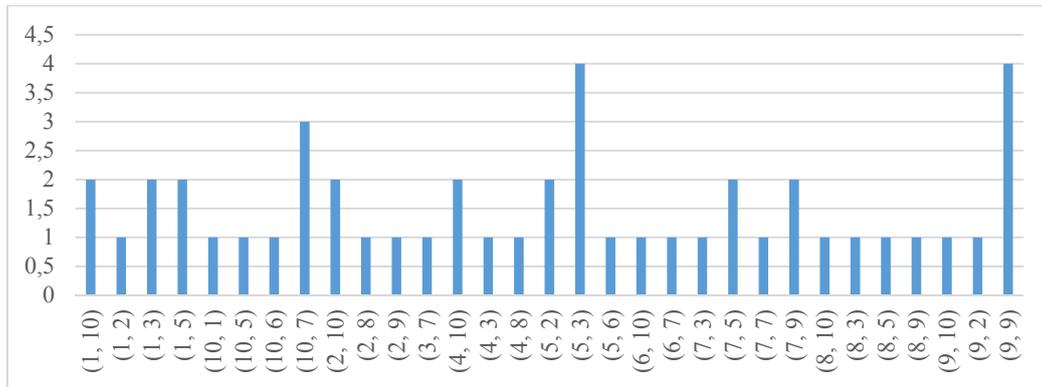
**Fig. 3: 100 Frequency of enterprises going bankrupt in the current year in Kohenen's map SOFM 154-100**



Source: Author

The graph in Figure No. 5 presents information about companies that will go bankrupt in the future, in individual clusters. Specifically, there are 47 companies divided into 31 clusters.

**Fig 4: Frequency of enterprises going bankrupt in the future in Kohonen's map SOFM 154-100**



Source: Author

This result is also not important for obtaining the unique characteristics of a company that should go bankrupt in the future. We are primarily interested in the percentage of enterprises that have gone bankrupt in the current year within the total number of enterprises. The value is 15.38%. The cluster comprises of 13 companies, 2 of which are going bankrupt in the current year. Therefore, the result is of no value.

#### 4.2 Analysis number 2

Analysis no. 2 works with these input data: fixed assets, current assets, equity, foreign resources and the economic result. As a general rule, a lower input number of variables should lead to clusters whose boundaries are sharper, and with regard to interpretation, are more comprehensible. A different topological grid was chosen for this analysis - the length and width will be set to 100. Again, the development of the training and testing errors of the network was shown.

It is interesting that the error upon finding the network was zero. The next step was illustrating the frequency of enterprises in individual clusters.

Unfortunately, the number of clusters increased and the 167 enterprises monitored (going bankrupt in the current year and future years) thus diluted into more clusters than was the case with the first analysis. Therefore, even analysis number 2 does not introduce significant and valid results.

#### 4.3 Analysis number 3

Analysis no. 3 works with these input data: fixed assets, current assets, equity, foreign resources and the economic result. As a general rule, a lower input number of variables should lead to

clusters whose boundaries are sharper, and with regard to interpretation, are more comprehensible. The topological length and width were recurrently set to the value of 10. The basic statistical characteristics of the used data set were determined. Again, the development of the training and testing error of the neural network SOFM 36-100 was depicted.

All 10000 training cycles were used in the third analysis. The achieved level of error for both samples is at a value nearing 0,3. Individual representations of enterprises in the neural network clusters were also shown in analysis no. 3.

The number of occupied clusters decreased to 62. Although this is a fairly interesting improvement, it does not necessarily signify the practical use of Kohonen networks for the eventual prediction of bankruptcy of a particular company. In the next step, the frequency of companies going bankrupt in the current year in individual clusters was observed.

120 bankrupt enterprises are divided into 21 clusters. This may signify a relatively higher chance of the practical use of Kohonen networks in identifying possible future bankruptcy.

In addition, the frequency of businesses likely to crash in the future in individual clusters was illustrated. Even in this case, the number of clusters decreased, in comparison to previous analyses, to 16. Overall, businesses going bankrupt are represented in 31 clusters. This is the case of cluster 4,9, and cluster 5,3 is also close. In the first case, the representation of companies going bankrupt in the current year is 31.82%, or in the second case, 20.59%. Even in this case, the use of Kohonen networks cannot be fully considered for the prediction of enterprise bankruptcy in neither current year nor future years.

## **Conclusion**

The aim of this paper was to verify the possibility of using Kohonen networks to identify companies that will go bankrupt.

To support the fulfilment, two research questions were formulated:

1. Are Kohonen's networks a suitable tool for identifying companies on the brink of bankruptcy?
2. Is it possible to determine the key indicators characterising bankrupting companies with the help of Kohonen's networks?

Pursuant to three conducted analyses on a sample of companies operating in the construction industry in the Southern Bohemian region in the years 2006-2015, we can conclude that

Kohonen's networks are not an appropriate tools for predicting the eventual bankruptcy of enterprises. Analyses showed that:

1. The smaller we set the topological width and length of the Kohonen map, the higher was the proportion of bankrupt enterprises within the total number of enterprises in the cluster. Unfortunately, the most we reach this way is the level of total representation of these enterprises in the examined data sample (when topological length and width is 1).
2. In the event that we set a higher value of topological length and width, we find that enterprises nearing bankruptcy are represented transversely through most clusters.
3. In the event that we set a higher value of topological length and width, we find that some clusters can contain relatively high amounts of bankrupt enterprises.

In such an event, answering the second research question would be ineffective. What is, however, apparent from the results achieve:

1. Potential bankruptcy is not a reflection of the specific values of individual financial variables (earnings, revenues, costs, etc.). It is rather the ability and willingness of management to bear risk.
2. The decision on bankruptcy (liquidation) is not often a matter of rational decision.

Pursuant to the analyses, it can be stated that Kohonen networks individually are inappropriate for the prediction of eventual financial distress. It is possible that, in combination with other instruments, more significant results can be achieved. The objective of the paper has been met.

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# EXPLORING THE IMPACT OF KNOWLEDGE MANAGEMENT PROCESS ON INNOVATION BY MEANS OF STRUCTURAL EQUATION MODELING: A RESEARCH IN AUTOMOTIVE INDUSTRY

Çağatan Taşkın – Dilek Taşkın

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## Abstract

**Purpose:** The purpose of this study is to explore the impact of knowledge management process on innovation by means of structural equation modelling and propose strategies for automotive companies. The research is conducted in the fourth biggest city of Bursa which is a leading automotive industry area.

**Design/methodology/approach:** The main population of this research consists of 252 automotive sub-industry companies that are registered to organized industry regions in Bursa city centre. A structured questionnaire was prepared based on the literature (Gold et al. (2001), Darroch (2003), Darroch (2005), OECD Oslo Manuel (2005), Du Plessis (2007), Carney ve Ryan (2010), Oeij et al. (2012)) and managers of the companies are asked to fill the questionnaire. 107 questionnaires were collected. Structural equation modelling is used to explore the impact of knowledge management process on innovation.

**Findings:** According to the research findings; knowledge acquisition, knowledge transformation and knowledge application were found to have positive impacts on knowledge protection and knowledge protection was found to have a strong impact on innovation. Finally, in the light of these modelling results, strategies are proposed for the companies of automotive sub-industry.

**Research/practical implications:** In today's consumer-oriented markets, innovation has become the most important factor of sustainable competitiveness for companies. Companies must focus on knowledge and knowledge management process in order to be innovative in today's economic environment that is rapidly changing because of the technological developments. According to Gold et al. (2001), knowledge management process consists of knowledge acquisition, knowledge transformation, knowledge application and knowledge protection steps. Company managers should know the relationships among these steps and the impact of these steps on innovation. This will lead to efficient knowledge management process, better innovation and competitive power for automotive companies.

**Originality/value:** Knowledge management and innovation are two crucial and related concepts. Because, knowledge serves as an important role in the innovation process. It is very important to have the information about the impact of knowledge management process on innovation because this information can lead companies' strategies and make companies more competitive. This study fills an important gap in the related literature by examining the influence of knowledge management process on innovation in Turkish automotive industry, Bursa region.

**Keywords:** Knowledge Management, Innovation, Automotive Industry, Bursa, Turkey

**JEL Codes:** O30 - O32

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## **Introduction**

The concept of knowledge management has relevance both from academic and practical perspectives. Knowledge management enables a business to develop competitive advantage and helps establish barriers of entry for potential competitors, because of its influence on innovation. In other words, innovation has become the most important factor of sustainable competitiveness for companies. Companies must focus on knowledge and knowledge management process in order to be innovative in today's economic environment that is rapidly changing because of the technological developments. The early framework developed by Gold et al. (2001) is the pioneering model which conceptualized knowledge management process. According to Gold et al. (2001), knowledge management process consists of knowledge acquisition, knowledge transformation, knowledge application and knowledge protection steps. Company managers should know the relationships among these steps and the impact of these steps on innovation. This will lead to efficient knowledge management process, better innovation and competitive power for automotive market where the competition is severe.

The purpose of this study is to explore the impact of knowledge management process (knowledge acquisition, knowledge transformation, knowledge application and knowledge protection) on innovation by means of structural equation modelling and propose strategies for automotive companies. The research is conducted in the fourth biggest city of Bursa which is a leading automotive industry area. The analysis results have implications for decision-makers in automotive industry.

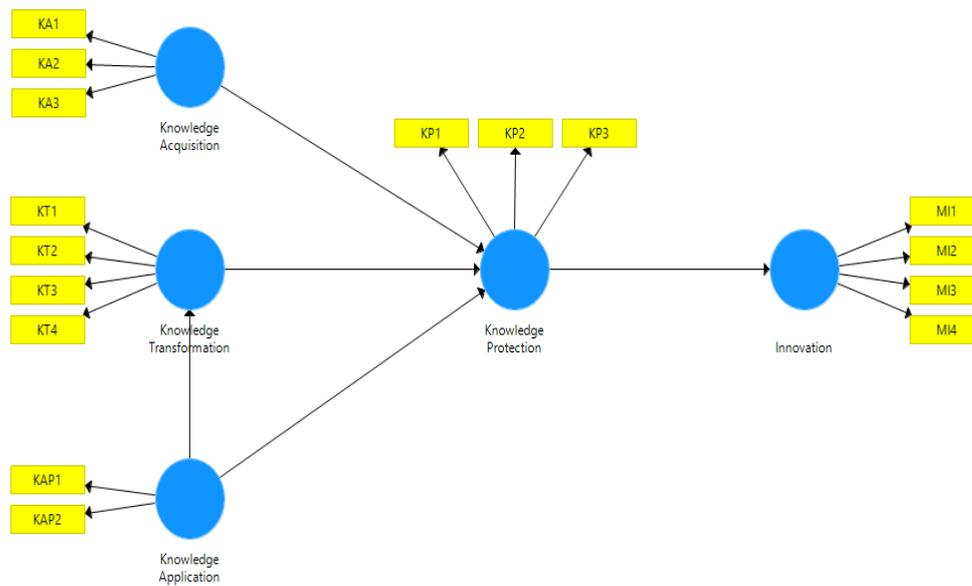
## **1 Methodology**

The main population of this research consists of 252 automotive sub-industry companies that are registered to organized industry regions in Bursa city centre. Questionnaires were sent to all of the managers of automotive sub-industry companies. Data were collected between October 2016 and January 2017. 107 questionnaires were used for the analysis. SmartPLS 3.0 program was used in the research.

### **1.1 Research Model and Hypotheses**

The research model of the study is shown in Figure 1. "Knowledge acquisition", "knowledge transformation", "knowledge application", "knowledge protection" and "innovation" are the variables of the model.

**Fig. 1: Research Model**



As seen from Figure 1, research hypotheses are:

- H<sub>1</sub>: “Knowledge acquisition” influences “knowledge protection” positively.
- H<sub>2</sub>: “Knowledge transformation” influences “knowledge protection” positively.
- H<sub>3</sub>: “Knowledge application” influences “knowledge protection” positively.
- H<sub>4</sub>: “Knowledge application” influences “knowledge transformation” positively.
- H<sub>5</sub>: “Knowledge protection” influences “innovation” positively.

## 1.2 Construct Validity of the Scale

The literature survey was done and the questionnaire of the research is formed (Gold et al. (2001), Darroch (2003), Darroch (2005), OECD Oslo Manual (2005), Du Plessis (2007), Carney and Ryan (2010), Oeij et al. (2012)). Then, the managers of the companies are asked to fill the questionnaire.

AVE and CR methods are used for construct validity. AVE values must be above 0.50 according to Kwong and Wong (2013). AVE values for Knowledge Acquisition, Knowledge Application, Knowledge Protection, Knowledge Transformation and Innovation are 0.57, 0.69, 0.58, 0.63 and 0.57, respectively. CR value is given as the result of the analysis carried out with SmartPLS and PLS estimation method, CR value should be 0,70 or more (Bagozzi and Yi, 1988; Cortina, 1993).

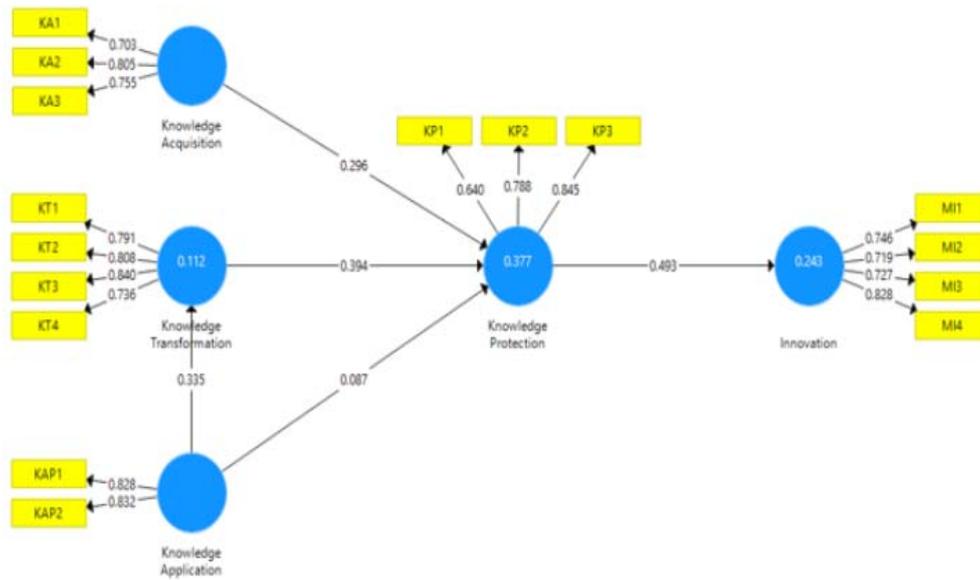
**Tab. 1: Construct Validity**

Construct	Item	Outer Loading	AVE	CR
Knowledge Acquisition	KA1	0.70	0.57	0.80
	KA2	0.81		
	KA3	0.76		
Knowledge Application	KAP1	0.83	0.69	0.82
	KAP2	0.83		
Knowledge Protection	KP1	0.64	0.58	0.80
	KP2	0.79		
	KP3	0.85		
Knowledge Transformation	KT1	0.79	0.63	0.87
	KT2	0.81		
	KT3	0.84		
	KT4	0.74		
Innovation	MI1	0.75	0.57	0.84
	MI2	0.72		
	MI3	0.73		
	MI4	0.83		

### 1.3 Testing the Research Model

Path coefficients of the model is given in Figure 2. Analysis results show that knowledge acquisition and knowledge transformation influence knowledge protection positively. However, knowledge application was found to have a statistically insignificant influence on knowledge protection. According to the modelling results, knowledge application influences knowledge transformation positively. Thus, knowledge application influences knowledge protection indirectly with the full mediation of knowledge transformation. Finally, knowledge protection was found to have an impact on innovation.

**Fig. 2: Structural Model and Path Coefficients**



**Table 2: Result of Hypothesis Testing and Structural Relationships**

Hypothesis	Path	Path Coefficient	t-Statistic	Decision
H <sub>1</sub>	Knowledge acquisition - knowledge protection	0.30	2.74	Supported
H <sub>2</sub>	Knowledge transformation - knowledge protection	0.39	3.44	Supported
H <sub>3</sub>	Knowledge application - knowledge protection	0.09	0.79	Not Supported
H <sub>4</sub>	Knowledge application - knowledge transformation	0.34	2.43	Supported
H <sub>5</sub>	Knowledge protection - innovation	0.49	6.97	Supported

The path coefficients between “knowledge acquisition and knowledge protection”, “knowledge transformation and knowledge protection”, “knowledge application and knowledge protection”, “knowledge application and knowledge transformation” and “knowledge protection and innovation” are 0.30, 0.39, 0.09, 0.34 and 0.49 respectively. According to the t-statistics; H<sub>1</sub>, H<sub>2</sub> and H<sub>5</sub> are supported at sig. level=1%), H<sub>4</sub> is supported at sig.level=5%), but H<sub>3</sub> is not supported.

### Discussion and Implications

This study has useful implications for both academics and practitioners in automotive industry. It is important for managers of automotive companies to explore the impact of knowledge

management process on innovation. Managers of automotive companies should use these results in order to make an effective knowledge management system because it is proved that knowledge management components influence innovation.

Findings showed that all of the latent variables can be considered as important dimensions that influence innovation. However, knowledge application was not found to have an significant influence on knowledge protection. Hence, H<sub>1</sub>, H<sub>2</sub>, H<sub>4</sub>, and H<sub>5</sub> were supported, while H<sub>3</sub> was not supported. The impact of of knowledge protection on innovation was found to be the highest value. It is very important to have the information about the impact of knowledge management process on innovation because this information can lead companies' strategies and make companies more competitive. This study also contributes to the literature as being one of the few researches that have examined the impact of knowledge management process on innovation in Turkish automotive industry, Bursa region.

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## **EXPLORING THE INFLUENCE OF ENTREPRENEURSHIP PERSONALITY ON ENTREPRENEURIAL INTENTION: A RESEARCH IN TURKEY**

**Çağatan Taşkın – Onur Öztürk – Ahmet Akif Karadamar**

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### **Abstract**

**Purpose:** It is well known that entrepreneurship is a crucial factor in global economy. It is regarded as a significant phenomenon for many researches. Considering the economic problems that countries face in today's world, understanding entrepreneurship and the personality traits of entrepreneurs became very important. As it is well known in the related literature, personality traits play a great role in entrepreneurial intentions. As attitudes toward entrepreneurship can be discussed through personality traits, this paper aims to clarify which personality traits have effects on entrepreneurial intentions. Personality traits can be described as the constructs describing behavioural patterns in people's lives. By shedding light on those traits which drives people's entrepreneurship motives, this paper will help us understand what makes people successful entrepreneurs.

**Design/methodology/approach:** The research was conducted on university students studying at Business Administration Department (Faculty of Economics and Administrative Sciences), Uludağ University, in Turkey. A convenience sampling method was used in the research. A structured questionnaire was prepared based on the literature (Owoseni, 2014; Çolakoğlu and Gözükara, 2016; Ozaralli and Rivenburgh, 2016). Structural equation modelling is used to test the influence of entrepreneurship personality that consists of innovativeness, need for achievement, alertness and locus of control, on entrepreneurial intention of university students.

**Findings:** This paper provides empirical insights about which personality traits have effects on entrepreneurial intentions. According to the modelling results, it is found that entrepreneurship personality has an influence on the entrepreneurial intention of university students.

**Research/practical implications:** Entrepreneurial intention is considered to be the most influential factors on the economic development of countries. The findings of the research suggest that entrepreneurial intention is significantly related with certain personality traits. This may contribute to the entrepreneurship literature. Furthermore, higher education institutions may benefit from these results to improve their content of entrepreneurial education considering the significance of personality traits for creating an economically strong country.

**Originality/value:** This study is one of the few researches that have examined the influence of entrepreneurship personality on entrepreneurial intention in Bursa which is a highly industrialized province. The results have implications for decision-makers in higher education institutions both at micro- and macro-levels, in terms of effective decision-making and resource allocation.

**Keywords:** Entrepreneurship, Entrepreneurial personality, Entrepreneurial intention, Turkey

**JEL Codes:** M10, M13, M21

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## **Introduction**

It is well known that entrepreneurship is a crucial factor in global economy. It is regarded as a significant phenomenon for many researches. Considering the economic problems that countries face in today's world, understanding entrepreneurship and the personality traits of entrepreneurs became very important. As it is well known in the related literature, personality traits play a great role in entrepreneurial intentions. The concept of entrepreneurship personality has relevance both from academic and practical perspectives. The entrepreneurship personality has been found to have impacts on entrepreneurial intention in several studies (Brice, 2004; de Pillis and Reardon, 2007; Liñán et al., 2011; Wang et al., 2011; Moriano et al., 2012; Çolakoğlu and Gözükara, 2016).

The aim of this study is to explore the influence of entrepreneurship personality dimensions (innovativeness, need for achievement, alertness and locus of control) on the entrepreneurial intention of university students studying at Business Administration Department in Bursa, Turkey. The analysis results have implications for decision-makers in higher education institutions both at micro- and macro-levels, in terms of effective decision-making and resource allocation. Hence, this paper will help us understand what makes people successful entrepreneurs.

## **1 Methodology**

The research was conducted on university students studying at Business Administration Department (Faculty of Economics and Administrative Sciences) at Uludağ University, Turkey. A convenience sampling method was used in the research. Data were collected in the months of February and March of 2017. A total of 245 questionnaires were collected. Based on the initial screening of the collected questionnaires 26 of them were excluded as they were incomplete. IBM SPSS 21.0 and SmartPLS 3.0 programs were used for the analysis of data. Structural equation modelling is used to test the influence of entrepreneurship personality that consists of innovativeness, need for achievement, alertness and locus of control, on entrepreneurial intention of university students.

The profile of the respondents is given in Table 1.

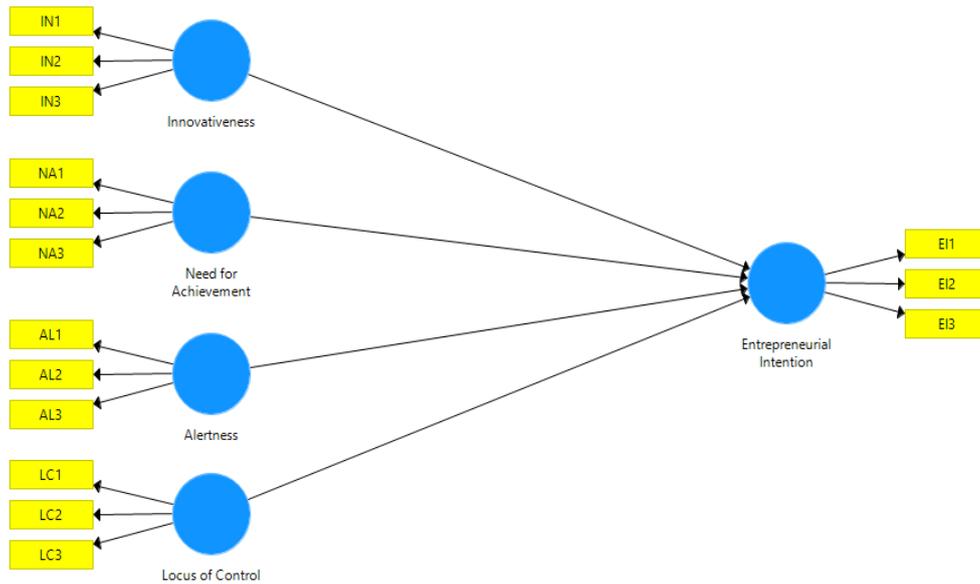
**Tab. 1: Profile of Respondents**

<b>Sex</b>	<b>Frequency</b>	<b>%</b>	<b>Participated in Erasmus</b>	<b>Frequency</b>	<b>%</b>
Male	92	42.0%	Yes	14	6.4%
Female	127	58.0%	No	205	93.6%
Total	219	100.0%	Total	219	100.0%
<b>Age</b>	<b>Frequency</b>	<b>%</b>	<b>Do Internship</b>	<b>Frequency</b>	<b>%</b>
18-22	129	58.9%	Yes	102	46.6%
23-25	87	39.7%	No	117	53.4%
26-30	3	1.4%	Total	219	100.0%
Total	219	100.0%			
<b>Take an Entrepreneurship Course</b>	<b>Frequency</b>	<b>%</b>	<b>Entrepreneur in Family</b>	<b>Frequency</b>	<b>%</b>
Yes	145	66.2%	Yes	142	64.8%
No	74	33.8%	No	77	35.2%
Total	219	100.0%	Total	219	100.0%

### 1.1 Research Model and Hypotheses

The research model is given in Figure 1. The variables included in the research model are; “innovativeness”, “need for achievement”, “alertness”, “locus of control” and “entrepreneurial intention”.

**Fig. 1: Research Model**



As seen from Figure 1, research hypotheses are:

*H<sub>1</sub>*: “Innovativeness” influences “entrepreneurial intention” positively.

*H<sub>2</sub>*: “Need for achievement ” influences “entrepreneurial intention” positively.

*H<sub>3</sub>*: “Alertness” influences “entrepreneurial intention” positively.

*H<sub>4</sub>*: “Locus of control”influences “entrepreneurial intention” positively.

## 1.2 Scale Used in Research and Construct Validity

A structured questionnaire was prepared based on the literature (Owoseni, 2014; Ozaralli and Rivenburgh, 2016; Çolakoğlu and Gözlükara, 2016).

**Tab. 2: Scale Used in Research**

<b>Dimension</b>	<b>Scale Items</b>
<b>Innovativeness</b>	<b>IN1.</b> I often surprise people with my novel ideas.
	<b>IN2.</b> People often ask me for help in creative activities.
	<b>IN3.</b> I am not a very creative person.
<b>Need for Achievement</b>	<b>NA1.</b> I will do very well in fairly difficult task relating to my study and my work.
	<b>NA2.</b> I will try hard to pass work performance.
	<b>NA3.</b> I will seek added responsibilities in jobs assigned to me.
<b>Alertness</b>	<b>AL1.</b> I think about work-related matters in my free time to start my own business.
	<b>AL2.</b> I think about work-related matters even during my holidays to start my own business.
	<b>AL3.</b> I think about new business ideas in my free time to start my own business.
<b>Locus of Control</b>	<b>LC1.</b> My success depends on whether I am lucky enough to be in the right place at the right time.
	<b>LC2.</b> When I get what I want, it is usually because I am lucky
	<b>LC3.</b> Success in business is mostly a matter of luck.
<b>Entrepreneurial Intention</b>	<b>EI1.</b> I never see myself becoming an entrepreneur.
	<b>EI2.</b> I have considered becoming an entrepreneur one day.
	<b>EI3.</b> I have never given the start-up of an enterprise much thought.

Construct validity results are given in Table 3. According to Fornell and Larcker (1981), the AVE (Average Variance Extracted) values of the structure must be 0,50 and above for the validity of latent structures. According to the results, the AVE values for Innovativeness, Need for Achievement, Alertness, Locus of Control and Entrepreneurial Intention are 0.65, 0.59, 0.82, 0.61 and 0.74, respectively. Composite Reliability value is given as the result of the analysis carried out with SmartPLS and PLS estimation method, Composite Reliability value should be 0,70 or more (Cortina, 1993).

**Tab. 3: Construct Validity**

Construct	Item	Outer Loading	AVE <sup>a</sup>	CR <sup>b</sup>
Innovativeness	IN1	0.85	0.65	0.85
	IN2	0.79		
	IN3	0.78		
Need for Achievement	NA1	0.81	0.59	0.81
	NA2	0.74		
	NA3	0.75		
Alertness	AL1	0.94	0.82	0.93
	AL2	0.85		
	AL3	0.93		
Locus of Control	LC1	0.62	0.61	0.82
	LC2	0.77		
	LC3	0.92		
Entrepreneurial Intention	EI1	0.85	0.74	0.92
	EI2	0.87		
	EI3	0.87		

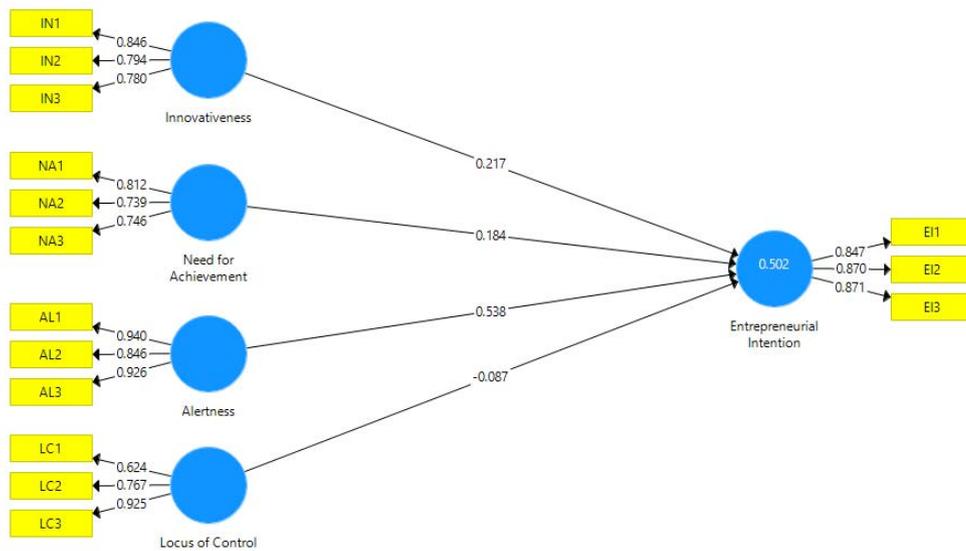
<sup>a</sup> Average variance extracted (AVE) = (summation of the square of the factor loadings) / {(summation of the square of the factor loadings) + (summation of the error variances)}.

<sup>b</sup> Composite reliability (CR) = (square of the summation of the factor loadings) / {(square of the summation of the factor loadings) + (square of the summation of the error variances)}.

### 1.3 Testing the Research Model by Partial Least Square Technique

The structural model with path coefficients is shown in Figure 2. The modeling results indicate that innovativeness, need for achievement and alertness dimensions of entrepreneurship personality influences entrepreneurial intention positively. However, locus of control dimension was not found to have a statistically significant influence on entrepreneurial intention.

**Fig. 2: Structural Model and Path Coefficients**



**Tab.4: Result of Hypothesis Testing and Structural Relationships**

Hypothesis	Path	Path Coefficient	t-Statistic <sup>a</sup>	Decision
H <sub>1</sub>	Innovativeness - Entrepreneurial Intention	0.22	3.80***	Supported
H <sub>2</sub>	Need for Achievement - Entrepreneurial Intention	0.18	3.15***	Supported
H <sub>3</sub>	Alertness - Entrepreneurial Intention	0.54	10.15***	Supported
H <sub>4</sub>	Locus of Control - Entrepreneurial Intention	-0.09	1.52	Not Supported

<sup>a</sup> t-values for two-tailed test

\* 1.65 (sig. level 10%)

\*\* 1.96 (sig. level=5%)

\*\*\* t-value 2.58 (sig. level=1%) (Hair et al., 2011; Rezaei, 2015)

The path coefficients between “innovativeness and entrepreneurial intention”, “need for achievement and entrepreneurial intention”, “alertness and entrepreneurial intention” and “locus of control and entrepreneurial intention” are 0.22, 0.18, 0.54 and -0.09 respectively. According to the t-statistics; H<sub>1</sub>, H<sub>2</sub> and H<sub>3</sub> are supported (sig. level=1%) but H<sub>4</sub> is not supported.

## **Discussion and Implications**

This study helps draw relevant and useful implications for both academics and practitioners in higher education. It is important for decision-makers, university managers, local authorities and other practitioners to analyze the impact of entrepreneurship personality on entrepreneurial intention. Thus, decision-makers may develop strategies which would allow them to evaluate their position in the education system. Additionally, the above practitioners may also use the findings to know what makes students and or people successful entrepreneurs.

Findings showed that alertness, innovativeness and need for achievement can be considered as three important dimensions that influence entrepreneurial intention. However, locus of control was found to have an insignificant influence on entrepreneurial intention. Hence, H<sub>1</sub>, H<sub>2</sub>, H<sub>3</sub> were supported, while H<sub>4</sub> was not supported. The result of H<sub>2</sub> supports the findings of de Pillis and Reardon (2007), Brice (2004). Additionally, the results of H<sub>1</sub>, H<sub>2</sub>, H<sub>3</sub> support the findings of Çolakoğlu and Gözükara (2016).

According to the results of the structural model, there were different influences among the dimensions of entrepreneurship personality. The most important was the influence of alertness on entrepreneurial intention. The insight gained based on the findings of the study are believed to enable allow above mentioned practitioners to make effective decisions and develop strategies in higher education system.

The findings of the study can be used to develop strategies in two levels such as local university and Bursa region. First, the students who are keen on entrepreneurship can be determined by conducting some personality trait analyses or tests. Then, lectures, seminars, networking and coaching opportunities should be provided for them to improve their entrepreneurship personality dimensions such as alertness and innovativeness. These types of activities and courses may lead them to be successful entrepreneurs. Successful entrepreneurs (especially young ones) can be invited to meet with entrepreneur candidates, share their experiences and life stories with them. Thus, this may inspire young students to be successful entrepreneurs. Briefly, open innovation is needed in entrepreneurship education of the local university including stakeholders into teaching and coaching activities.

Secondly, it is known that Bursa region is an important industrialized city of Turkey. Automotive and machinery manufacturing are the leading sectors in Bursa region. Most of the companies are small and medium-sized enterprises that compete internationally. There can be formal arrangements for the students who are keen on entrepreneurship with the leading companies of Bursa region. Thus, the students may have the chance to observe leading

companies by having internships or part-time jobs. In addition, in order to increase the competitiveness of the region, young entrepreneurs are needed. That's why, business incubator programmes should be implemented.

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## **DOES ENVY INFLUENCE THE ENTERPRISE POTENTIAL AND THE ENTREPRENEURIAL INTENTIONS?**

**Edit Terek - Milan Nikolić - Dragan Čočkaló - Sanja Božić - Aleksandra Nastasić**

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### **Abstract**

**Purpose:** The aim of this paper is to examine the impact of envy on the enterprise potential and the entrepreneurial intentions. This topic is not much studied, but it is important to examine all aspects of complex networks of influence on enterprise potential and the entrepreneurial intentions.

**Design/methodology/approach:** The survey was conducted in Serbia. The subjects were students from 5 faculties, from the first to the fifth year of study. Collected were about 380 completed questionnaires. Correlation and regression analysis are the methods of statistical analysis that were used. The survey was conducted using three separate questionnaires: questionnaire measuring envy (8 items, 1 dimension), questionnaire measuring enterprise potential (18 items, 4 dimensions) and questionnaire measuring entrepreneurial intentions (15 items, 3 dimensions).

**Findings:** Between envy and dimensions of enterprise potential and dimensions of entrepreneurial intentions there is a number of statistically significant negative correlations. This is more prevalent at the dimension of entrepreneurial intentions. Feelings of inferiority in relation to other people, the perception of having a boring or a bad life, has an especially negative impact on the entrepreneurial potential and intentions. Envy, which occurs due to the desire for more entertainment, travel, and due to the perception of the lack of fortune, also has a negative impact on the entrepreneurial potential and intentions, but the influence is considerably weaker.

**Research/practical implications:** Some results suggest the possibility (however small) that envy, in some circumstances, can mildly encourage entrepreneurial intention. Based on these results, the recommendation is to recognize people whose envy is not strong and where there is a possibility that such envy can be turned into motivation. With adequate support and understanding, these people may be potential, future entrepreneurs.

**Originality/value:** Determining the impact of envy on the enterprise potential and the entrepreneurial intentions in the case of Serbian students.

**Keywords:** Envy, Enterprise potential, Entrepreneurial intentions, Students, Serbia

**JEL Codes:** L26, D14, I23

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## **Introduction**

Entrepreneurs and their innovations enormously contribute to the overall national wealth (Miller, 2015). Entrepreneurship contributes to self-employment and employment, increasing competitiveness and increasing standard of living, and therefore undoubtedly has a great importance for every society. As the bearers of this process, society needs entrepreneurs and it is necessary to provide them support and encourage people to become entrepreneurs.

However, according to (Miller, 2015), entrepreneurs, in addition to their positive qualities, such as energy, self-confidence, need for achievement, independence, and others, have some negative personal characteristics, which are often neglected. So entrepreneurs can sometimes manifest traits, such as: aggressiveness, narcissism, ruthlessness and irresponsibility.

Due to the wider national significance, it is important to examine the various impacts on the occurrence of entrepreneurial intentions and launching new business venturing. One of the negative personality traits, which may have significance on entrepreneurial intentions, is envy. Envy is not so explored in the context of entrepreneurship. According to (Mui, 1995), envy can have a significant role in economic behavior. Indeed, one can raise the question of whether and how envy influence the entrepreneurial intention? On one hand, envy can inhibit entrepreneurial intentions and entrepreneurial behavior, but on the other hand, envy can also be an incentive for self-employment. The aim of this paper is to determine the direction and strength of the relationship between envy and the enterprise potential, as well as the relation between envy and the entrepreneurial intentions. The survey was conducted in the case of students in Serbia.

## **1 Theory and hypothesis**

### **1.1 Envy**

According to (Biniari, 2012), the emergence of envy is an indication of the low level of emotional and social embeddedness. Changes and development of emotional competences, such as self-management, social awareness and relationship management have a positive impact on entrepreneurial orientation, especially on innovation and easier risk-taking (Meléndez, Fernández-Gámez, & Gómez, 2014). This later leads to increased entrepreneurial intentions. Thus, improvement and higher levels of emotional competences has a positive impact on entrepreneurial intentions. Envy is certainly not an indication of a high level of emotional

competences, so indirectly it can be concluded that the existence of envy has a negative impact on entrepreneurial intention.

Compared to other groups, entrepreneurs, much less worry about negative facts (counterfactual thinking) and less complain about past events (Baron, 2000). At the same time, thinking about negative facts generates negative affective states (regret, resentment, envy). With these feelings it is more difficult to enter into new ventures. What is of importance for this paper is that it can be concluded that entrepreneurs are less envious, compared to other people. Any envy is an indicator of negative affective states, which adversely affects entrepreneurial intentions.

Perhaps envy hampers entrepreneurship but entrepreneurship can cause envy (Choi, 1993). For example, between leadership and envy there is a correlation (Stein, 1997). Leadership is associated with attributes such as power, authority and prestige. These attributes can cause envy at colleagues and employees, as well at some friends and colleagues outside the organization where the leader works. At the same time, the leaders themselves may feel envious of their colleagues that they believe are a threat to their leadership position. No matter from which sides they come from, these feelings certainly have a negative effect on leadership, collaboration, and business outcomes of an organization (Stein, 1997).

## **1.2 Enterprise potential**

Enterprise potential refers to a latent tendency for a person to become an entrepreneur. That still does not mean that this person wants and has the firm intention to become an entrepreneur, but that he/she possess qualities and attitudes that are conducive to launching entrepreneurial ventures. Measuring enterprise potential is significant and often researched topic in the field of entrepreneurship (Athayde, 2009).

Robinson, Stimpson, Huefner, and Hunt (1991) developed EAO Scale (Entrepreneurial Attitude Orientation Scale) for measuring attitudes toward enterprise. This model consists of four dimensions: achievement in business, self-esteem in business, personal control of business outcomes and innovation in business. In this paper, enterprise potential is observed and measured by a model that is based on a number of previous studies, developed by Athayde (2009). This model was originally comprised of the following five dimensions for assessing attitudes towards entrepreneurship: leadership, creativity, achievement, personal control and intuition. Later, during the formation and testing of the model, the dimension intuition was omitted.

### **1.3 Entrepreneurial intention**

The decision to become an entrepreneur, as well as entrepreneurship, requires certain time, that is, represent a process that takes place in a specified period (Gartner, Shaver, Gatewood, & Katz 1994). The first step of this process is the existence of entrepreneurial intention (Lee & Wong, 2004). According to (Liñán & Chen, 2009), entrepreneurial intention has a very important role when deciding to start a business venturing, as evidenced by a significant number of scientific papers dealing with this issue. The existence of entrepreneurial intention is a reliable predictor of entrepreneurial behavior and entrepreneurship (Koe, 2016).

On the number of entrepreneurs in different countries can be influenced by the development of entrepreneurial intentions at individuals. This will certainly have a positive impact on society. It is therefore important to study entrepreneurial intentions. In this paper, entrepreneurial intentions are measured by entrepreneurial intention questionnaire (EIQ) (Liñán & Chen, 2009). This questionnaire has four dimensions: personal attitude, subjective norm, perceived behavioral control and entrepreneurial intention. The first three dimensions represent the motivational factors, antecedents that influence on entrepreneurial behavior (Ajzen, 1991; Liñán & Chen, 2009).

On the basis of previous exposure, the following hypotheses were set:

- H1*: There is a statistically significant negative correlation between envy (items and dimension) and dimensions of enterprise potential.
- H2*: There is a statistically significant negative correlation between envy (items and dimension) and dimensions of entrepreneurial intentions.
- H3*: There is a statistically significant predictive effect of envy items (independent variable) on the dimensions of enterprise potential and dimensions of entrepreneurial intentions (dependent variable).

## **2 Methodology**

### **2.1 Survey instrumentss**

Envy. For the measurement of envy, the questionnaire Scale of Facebook envy was used (Tandoc, Ferrucci, & Duffy, 2015). The questionnaire contains eight items, which constitute one dimension. Respondents classify each item ranging from 1 to 5. Items are the following: 1. I feel inferior in comparison with other people (EN1); 2. It's frustrating to watch other people always having a good time (EN2); 3. It is not fair that only some people are having fun (EN3); 4. I'd like to be able to travel as much as some of my friends do (EN4); 5. Many of my friends

have a better life than me (EN5); 6. Many of my friends are happier than me (EN6); 7. My life is not as funny as the life of my friends (EN7); 8. Life is cruel and unjust (EN8).

Enterprise potential. For the measurement of enterprise potential the questionnaire that was used is Attitude Toward Enterprise (ATE) Test (Athayde, 2009). The questionnaire has 18 items distributed in 4 dimensions. The respondents evaluated each item ranging from 1 to 7. The dimensions are as follows: 1. Leadership (LEA); 2. Creativity (CRE); 3. Achievement (ACH); 4. Personal control (PC).

Entrepreneurial intentions. To measure entrepreneurial intentions the entrepreneurial intention questionnaire (EIQ) was used (Liñán and Chen, 2009). The questionnaire has 20 items distributed in 4 dimensions. The respondents evaluated each item ranging from 1 to 5. In this study, we used the following three aspects: 1. Subjective norm (SN); 2. Perceived behavioral control (PBC); 3. Entrepreneurial intention (EI).

## **2.2 Participants and data collection**

The survey was conducted on a sample consisting of students of five faculties in Serbia. The biggest number of the respondents were students of technical faculties and economy. In the sample there were present about equally students from the first to the fifth year of study. The surveyed students do not have previous entrepreneurial experience. The survey was conducted during classes and questionnaires were anonymous. The survey was conducted from November 2016 till February 2017. A total of 380 valid questionnaires were collected. Age group, which was interviewed ranges from 18 to 27 years. In the sample there was 237 female students and 143 male students.

## **3 Results**

### **3.1 Correlation analysis**

Correlation analysis was performed between envy items (respectively) and envy dimensions on the one hand, and enterprise potential dimensions and entrepreneurial intentions dimension on the other hand. Pearson Correlation was used. The results of the correlation analysis are given in Table 1.

**Tab. 1: Pearson coefficients of correlation between envy (items and dimension) and dimensions of enterprise potential and dimensions of entrepreneurial intentions**

		LEI	CRE	ACH	PC	SN	PBC	EI
EN1	Pearson	<b>-.215**</b>	-.038	<b>-.271**</b>	<b>-.103*</b>	-.091	<b>-.191**</b>	<b>-.124*</b>
	Correlation							
	Sig. (2-tailed)	.000	.463	.000	.044	.077	.000	.015
EN2	Pearson	-.096	.018	<b>-.147**</b>	-.034	<b>-.178**</b>	<b>-.120*</b>	<b>-.103*</b>
	Correlation							
	Sig. (2-tailed)	.062	.729	.004	.513	.000	.019	.045
EN3	Pearson	-.011	.053	-.019	-.036	.043	.009	.048
	Correlation							
	Sig. (2-tailed)	.829	.303	.713	.486	.403	.860	.353
EN4	Pearson	-.042	<b>.181**</b>	-.035	-.005	<b>-.125*</b>	-.074	-.065
	Correlation							
	Sig. (2-tailed)	.414	.000	.495	.920	.015	.151	.205
EN5	Pearson	-.024	.055	-.063	-.059	<b>-.253**</b>	<b>-.181**</b>	<b>-.199**</b>
	Correlation							
	Sig. (2-tailed)	.646	.281	.220	.254	.000	.000	.000
EN6	Pearson	-.033	.032	-.089	-.001	<b>-.199**</b>	<b>-.130*</b>	<b>-.114*</b>
	Correlation							
	Sig. (2-tailed)	.518	.538	.083	.979	.000	.011	.026
EN7	Pearson	<b>-.140**</b>	-.013	<b>-.156**</b>	-.048	<b>-.146**</b>	<b>-.173**</b>	<b>-.179**</b>
	Correlation							
	Sig. (2-tailed)	.006	.798	.002	.353	.004	.001	.000
EN8	Pearson	-.093	.003	-.085	-.042	-.086	<b>-.130*</b>	-.051
	Correlation							
	Sig. (2-tailed)	.070	.952	.097	.412	.095	.011	.325
EN	Pearson	<b>-.114*</b>	.060	<b>-.148**</b>	-.058	<b>-.184**</b>	<b>-.175**</b>	<b>-.136**</b>
	Correlation							
	Sig. (2-tailed)	.027	.244	.004	.261	.000	.001	.008

\* Correlations significant at the level 0.01

\*\* Correlation significant at the level 0.05

### 3.2 Regression analysis

Predictive effect of envy on the dimensions of enterprise potential and dimension of entrepreneurial intentions is determined via Multiple Regression Analysis. Whereas the envy (items and dimension) are independent variables, while dimensions of enterprise potential and

dimensions of entrepreneurial intentions are dependent variables. Table 2 shows the results of the regression analysis.

**Tab. 2: Regression analysis (Independent Variable: envy - items and dimension, Dependent Variable: dimensions of enterprise potential and dimensions of entrepreneurial intentions)**

Dep. Var.	Independent Variable								R <sup>2</sup>	F	Sig.
	EN1	EN2	EN3	EN4	EN5	EN6	EN7	EN8			
	$\beta$										
LEA	<b>-.220**</b>	-.029	.097	-.031	.085	.158	<b>-.185*</b>	-.103	.079	3.962	.000
CRE	-.059	-.010	.030	<b>.206**</b>	.002	.056	-.083	-.051	.044	2.126	.003
ACH	<b>-.256*</b>	-.070	.106	-.002	.073	0.81	-.130	-.072	.092	4.722	.000
PC	-.114	.026	-.023	.042	-.123	.166	-.051	-.036	.022	1.061	0.390
SN	.043	<b>-.198**</b>	<b>.213*</b>	-.037	-.212	-.012	-.011	.001	.103	5.308	.000
PBC	<b>-.138**</b>	-.050	<b>.139*</b>	.008	-.148	.142	-.129	-.091	.076	3.794	.000
EI	-.047	-.076	.169	.014	<b>-.242**</b>	<b>.193**</b>	<b>-.189**</b>	.007	.080	4.059	.000

\*  $\beta$  coefficients significant at the level 0.01

\*\*  $\beta$  coefficients significant at the level 0.05

## 4 Discussion

Table 1 shows the results of correlation analysis. It can be seen that dominant are the negative correlations, and there is a bigger number of statistically significant negative correlations. This is especially true for the dimensions of entrepreneurial intentions. Based on these results, we can say that the hypothesis H1 and H2 are verified, especially hypothesis H2.

From the envy items, the strongest negative correlation has the item EN1 - I feel inferior in relation to other people, then items EN7 - My life is not as funny as the lives of my friends and EN5 - Many of my friends have a better life than me. Indeed, it is difficult to imagine in the role of entrepreneur, especially a successful entrepreneur, people who have a sense of inferiority in relation to other people. This feeling is definitely not conducive to entrepreneurship. The situation is similar at people who see their lives as boring and worse than some other people have. It may be expected that the perception of bad life may seem motivating, but this does not happen. It should be noted that the dimension envy has fairly high negative

correlations, that is in accordance with the results of envy items. From envy items at least negative correlations have the item EN3 - It's not fair that only some people are having fun (This item has actually positive, but not statistically significant correlations), then items EN4 - I'd love to travel as much as some of my friends and EN8 - Life is harsh and unfair. These three items can describe people who are less fortunate, do not have rich parents, need to work harder and similar things. These people still should not be dismissed as future entrepreneurs, in fact, they should be encouraged and given a chance to start their own business.

From enterprise potential dimensions and entrepreneurial intentions dimensions, the strongest negative correlations occur at dimensions SN - Subjective norm and at dimensions PBC - Perceived behavioral control and ACH - Achievement. Apparently the lack of support from family, friends and colleagues leads to increased envy. It is possible that increased envy causes little support by the environment. Also, the lack of confidence in their own abilities, and energy to achieve goals, foster envy. It is interesting to note that in Table 1 there is a statistically significant but positive correlation. This occurs between the item EN4 - I'd love to be able to travel as much as some of my friends and dimension CRE - Creativity. The desire to travel does not have to be necessarily viewed as an indicator of envy, but as a positive tendency to learn about different countries, cultures, people, traditions, food, to experience different adventures. Therefore, it is logical that these desires are associated with creativity.

The results of regression analysis (Table 2) show that there is a statistically significant predictive effect of certain items of envy on the enterprise potential dimensions and entrepreneurial intentions dimensions. However, this fact is not so strongly expressed. Accordingly, the value of the corrected index determination  $R^2$ , are quite low and range between 0.022 and 0.103. It can be concluded that the hypothesis H3 is partially confirmed.

The results of regression analysis are generally consistent with the results of correlation analysis. However, there is one interesting exception: a statistically significant positive predictive effect of item EN6 - Many of my friends are happier than me to the dimension of EI - Entrepreneurial intention. Here we can see a slight hint that envy in some complex relationships and in a broader context, can contribute to the development of entrepreneurial intentions. Thus, it should be borne in mind that envy in some situations and circumstances can mildly encourage entrepreneurial intention.

## Conclusion

Between envy (items and dimension) and dimensions of enterprise potential and dimensions of entrepreneurial intentions there is a bigger number of statistically significant negative correlation. This is more prevalent at the dimension of entrepreneurial intentions. Feelings of inferiority in relation to other people, the perception of boring and bad of life, have especially negative impact on the entrepreneurial potential and intentions. From the standpoint of entrepreneurial potential and intentions, envy is aggravated due to poor support from family, friends and colleagues, as well as a lack of confidence and vigor.

On the other hand, envy, which occurs due to the desire for more entertainment, travel, and due to the perception of the lack of fortune, also has a negative impact on the entrepreneurial potential and intentions, but this influence is much weaker. At the same time, the results of the regression analysis indicate a low possibility that envy, in some circumstances, can slightly encourage people towards entrepreneurial intention. Based on these results, it is recommended that people should not from the very beginning write off all the envious people as not suitable for entrepreneurship. There should be identified those in whom envy is not strong and where there is a possibility that such envy could be turned into motivation. With adequate support and understanding, these people may be a potential future entrepreneurs.

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# ARE CUSTOMERS READY FOR EVOLVING DIGITAL DISRUPTION?: EMPIRICAL EVIDENCE FROM BANKING SECTOR OF SERBIA

Vesna Tornjanski - Mladen Cudanov

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## Abstract

**Purpose:** This study aims to extend and deepen the understanding of whether customers of the banking sector of Serbia are ready for digital disruption – the phenomenon which significantly reshapes long successful business model and at the same time creates a new landscape of banking operations. The purpose of this paper is to research obstacles of internet-based technologies adoption in the banking sector of Serbia.

**Design/methodology/approach:** The paper opted for a survey research method utilising a web-based questionnaire as a research instrument. The sampling frame consisted of the customers of 24 banks that operate in Serbia. Of the total asked customers to participate in the research study, 607 took part in it. Data were analysed in three main phases, using certified statistical methods.

**Findings:** The study introduces several findings. First, the research results show that customers have equal preferences between traditional banking services and e-business services. This finding further indicates potential difficulties in adopting new forms of banking business model(s) that digital era imposes to banks for a significant number of users of banking services. Second, the study reveals the main reasons of why customers do not favour to use internet-based technologies in Serbia, which further facilitate the introduction of new strategies and measures toward finding effective solutions for both parties.

**Research/practical implications:** The research findings address important implications to academics and managers in financial services to narrow the gap between digital pressures and customers' satisfaction, and to facilitate further development of business strategies towards sustainable competitiveness in the banking sector of Serbia.

**Originality/value:** This study is based on primary data and original hypothesis for the observed environment. Analysed data help explain issues in the important field of readiness for evolving digital disruption, by exploring issues of internet-based technologies acceptance in banking sector of Serbia. The paper contributes to the innovation theory and enhances the literature on the subject of digital disruption and technology adoption in banking sector in country's context, which has been poorly addressed so far.

**Keywords:** Digital disruption, banking industry, internet-based technologies adoption, sustainable competitiveness, customers' satisfaction

**JEL Codes:** D12, G21, O33

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## **Introduction**

Internet and digitisation are widely recognised forces that are changing banking industry at an extraordinary pace, while extraordinarily disturbing well-established business models. These dominant influences have built a path of dramatic banking sector's transition, creating numerous challenges and opportunities and at the same time imposing sizeable pressure on banks to increasingly evolve. The transformative chapter, through which banking sector is undergoing nowadays, has initiated significant paradigm shift that resulted in a remarkable re-evaluation of extant strategies, operating models and organisational structure towards principles based on flexibility, agility and customer centricity. Moreover, these influential changes will create a new landscape which will, presumably, define key players capable to compete on the market in years to come (Tornjanski et al., 2017).

Many traditional banks heavily invest into automation and digitisation of processes with twofold objectives to (1) effectively provide superior value to its customers, suppliers and other stakeholders and (2) to improve operational efficiency, financial and organisational performances. From customers' perspective, it has been recognised that internet banking can bring many advantages to end users such as costs savings, comfortable access to banking services and information with no time and location limitations, reduction of waste time and extensive self-efficacy improvement (Curran et al., 2005). Despite the benefits, online banking provides to customers, and internet users growth worldwide, evidence shows poor acceptance rate when internet banking is in question, implying significant concern for banking institutions (Xue et al., 2011; Montazemi & Qahri-Saremi, 2015). Taking into account that banking industry is at the onset of another shift due to disruptive technologies that develop and mature much faster and more profoundly than ever before (Berman & Marshall, 2014) in one hand, and insufficient acceptance rate of an existing internet-based banking services on the other, this paper sets out to extend and deepen the literature on the subject of digital disruption and technology adoption in banking sector of Serbia – country that has been poorly addressed so far. The purpose of this paper is to research key obstacles of internet-based technologies acceptance, maintained by banks in Serbia.

## **1 Literature review**

Banking sector of Serbia has experienced significant transformation since the 1990-ties characterised by political instability, hyperinflation and collapse of the financial service sector. Structural economic reforms, restructuring measures, a wave of privatisation and liberalisation

consolidated it after the year of 2000 into market oriented and functional sector (Barisitz & Gardó, 2008; Sokic, 2015). Today, 30 active banks mostly controlled by foreign capital companies (Savoiu & Siminica, 2016), having a high level of competition, and facing imminent digital disruption. Lyytinen and Rose (2003), define disruptive information technology (IT) innovation as the process of IT based architectural innovation creation, which has radical effects on the development courses and their outcomes. Disruptive technology, also, represents a technology that transforms basic principles of competition by shifting metrics of performances with which organisations compete on the market, and is perceived as a particular type of change that functions by way of precise mechanism bringing certain consequences to businesses (Fan & Suh, 2014). World Economic Forum and Deloitte (2015), in their recent research, have addressed key disruptive innovation issues in the financial service sector. It has been noted that there is still no consolidated taxonomy and clear understanding of most relevant disruptive innovations, their evolutionary path and implications on incumbent business models in banking. The report reveals that disruption will cause continuous pressure on banks to innovate, shaping new business models, new structure and customer behaviors (World Economic Forum & Deloitte, 2015).

Social media, mobile phones, analytics, cloud, robotics and other related Internet-based technologies are recognised as emerging digital technologies in banking, which facilitate an unprecedented degree of connectivity with end-users, revolutionising the form of interactions and customers' engagement (Berman & Marshall, 2014). The phenomenon of disruptive information technology innovation initiates dramatic re-design of business processes, enabling considerable organisational performance improvements, increase efficiency, knowledge and dynamic capabilities enhancements, as well as overall growth in business (Lyytinen & Rose, 2003; Lui et al., 2016). Despite its opportunities, the disruptive information technology innovation has certain shortcomings that can produce adverse effects to firm performance. One of the obstacles is seen in disruptive IT innovations technology adoption by end-users. Disruptive innovation requires new resources of knowledge, skills and capabilities without which outcomes are likely to be unfavourable for investors. Also, it has been argued that disruptive change fails due to high pressures of resistance to change (Washington & Hacker, 2005). On the other hand, it has been recognised that managerial orientation towards results provides more effective adoption of ICT in the organization (Čudanov & Jaško, 2012). Another view of the phenomenon is that superior value from technology adoption can reach its maximum after years of implementation. In other words, disruptive innovations can be economically feasible after a long period. Accordingly, the adoption of disruptive technology

is considered as risky, expensive and uncertain on the long run (Lui et al., 2016). Matured internet-based technologies, explored in this study can be seen as the mid-step between traditional and disruptive business and lessons from its adoption can explain future disruptive trends. Related to that, we hypothesise:

*H1:* The majority of observed participants prefer to use e-business services provided by banks in Serbia rather than traditional branch services.

*H2:* Customers who are preferably using e-business services are more satisfied with the services in comparison to a group of customers who prefer traditional ways of the banking business, i.e. those who prefer to use on-site banking services.

*H3:* For customers who prefer to use on-site banking, key barriers to use e-business services lie in the lack of safety, trust and knowledge, while key obstacles for customers who prefer to use e-business services represent data security, service quality and deficiency of ATMs.

## **2 Research methods**

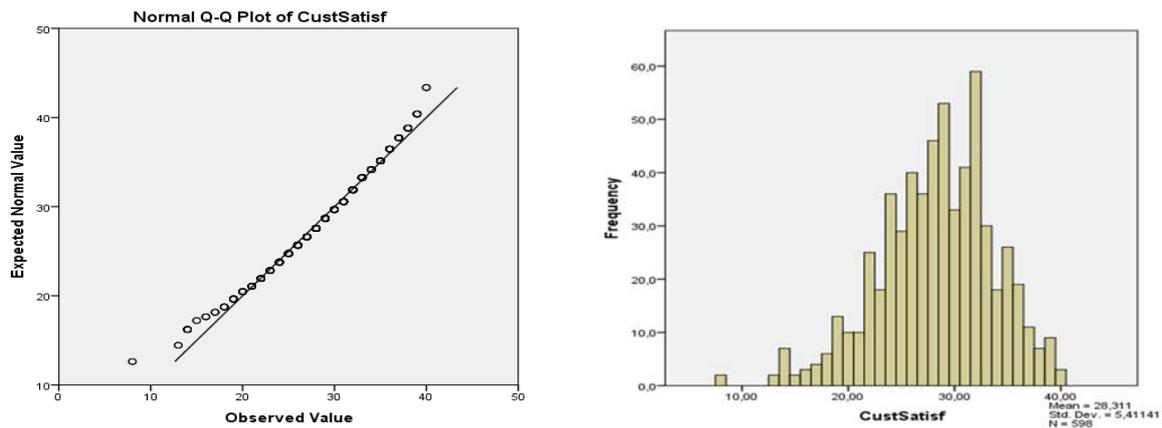
We have used an internet based self-administered questionnaire to gather primary data. Sampling frame includes customers of the 24 banks that operate in Serbia. We have collected 607 valid questionnaires, but due to conflicting control question answers, nine answers were excluded from the study, resulting in 598 respondents for further analysis. Main construct, „Customer Satisfaction“ consists of the following items: a) Satisfaction - overall with the bank; b) Satisfaction with speed and precision of response to customers; c) Satisfaction with speed of financial transactions; d) Satisfaction with information regarding transactions and bank services; e) Satisfaction with ATM location and accessibility; f) Satisfaction with e-banking services; g) Satisfaction with mobile-banking services; h) Satisfaction with customer complaints solving process. First item „Satisfaction - overall with the bank“ was also used as a control variable in the study.

Data were analysed in three main phases using SPSS software package. The first phase refers to scale reliability test using Cronbach's Alpha. The second phase of data analysis implies distribution normality assessment utilising QQ plot and histogram. Final phase appertains to hypothesis testing. Hypotheses were tested using an independent t-test, crosstab analysis and chi-square statistics.

### 3 Results

The first phase of data analysis refers to scale reliability test. The output of Cronbach's Alpha test indicates a high level of internal consistency of the construct ( $\alpha=0.848$ ). Regarding the distribution normality test, the results depicted in Figure 1 indicate normal distribution, although slight deviations at low and high ends are present.

**Fig. 1: QQ plot and Histogram for customer satisfaction variables**



Source: Authors

With regard to hypotheses 1 and 2, an independent samples t-test was designed with twofold objective. First objective is to reveal preferences of end-users in the context of usage on-site and e-business services. Second objective is to compare customers' satisfaction score between the group of customers who favor to use on-site and the group of customers who adopted e-business technologies. The results are shown in Tables 1 and 2.

**Tab. 1: T-test group statistics results**

	Bank service preference	N	Mean	Std. Deviation	Std. Error Mean
Customer satisfaction	On-site	312	27.7468	5.31242	.30076
	E-business	286	28.9266	5.46037	.32288

Source: Authors

Based on the results depicted in Table 2. 52.17% of the total respondents prefer to use on-site banking services (N=312), while 47.83% users favour using e-business services (N=286). With respect to customers' satisfaction, e-business users ( $28.9266 \pm 5.46037$ ) are slightly more satisfied in comparison to on-site users ( $27.7468 \pm 5.31242$ ). Table 2. illustrates the output of introduced independent samples test.

**Tab. 2: Independent samples test results**

Customer satisfaction	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.099	.753	-2.677	596	.008	-1.17978	.44073	2.04534	-.31421

Source: Authors

T-test ( $t=-2.677$ ;  $p<0.05$ ) indicates that the difference between the two means is statistically significantly different at the 5% level of significance. Based on the results, we can conclude that hypothesis 1 is not supported, while hypothesis 2 is supported.

Hypothesis 3 is verified using crosstabs and chi-square statistics. The results are presented in Tables 3 and 4. Table 3 provides an insight into the main reasons that disturb full e-business adoption potential in banking sector of Serbia.

**Tab. 3: Overview of reasons obstructing customer to use e-business services**

	Main reason obstructing customer to use e-business	Bank service preference		Total
		On-site	E-business	
	Data security	97	83	180
	Insufficient quality of service over the internet and mobile banking	32	82	114
	Not enough ATM machines	40	60	100
	I do not sufficient trust in e-banking	68	30	98
	I do not have enough knowledge to use Internet-based technologies	75	31	106
	<b>Total</b>	<b>312</b>	<b>286</b>	<b>598</b>

Source: Authors

According to the respondents' opinion who favour using on-site banking, main limitations for e-business services adoption refer to the lack of safety ( $N=97$ ), insufficient knowledge ( $N=75$ ) and not enough trust into e-banking services ( $N=68$ ). On the other hand, customers who prefer to use e-business services recognize that data security ( $N=83$ ), service quality ( $N=82$ ) and deficiency of ATMs ( $N=60$ ) are key issues for taking all the benefits that internet-based technologies provide. Table 4 illustrates overall results of chi-square tests.

**Tab. 4: Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	58.999 <sup>a</sup>	4	.000
Likelihood Ratio	60.636	4	.000
Linear-by-Linear Association	18.360	1	.000
N of Valid Cases	598		

Source: Authors

The results are statistically significant at  $p < 0.01$ . Accordingly, hypothesis 3 is supported.

## 4 Discussion

Recalling to the underlying external influences that disturb banking industry, this study sets out to explore whether customers of the banking sector of Serbia are ready for evolving digital disruption. The research reveals several findings that should be further elaborated.

First, the research results show that customers have an equal preference between traditional and e-business services. In other words, a significant number of customers (52.17%) still favours using traditional banking services. Taking into account that internet-based technologies, which were the subject of this research study, can be considered as matured at the market in Serbia, the finding indicates possible difficulties in effective adoption of new disruptive information technology innovations in banking, implying a potential unfavourable rate of return on investments. Also, this can explain how, measured in Malmquist index, productivity of the banking sector in Serbia is declining (Marković et al., 2015).

Second, although customers who preferably use on-site banking services are satisfied in general, the results show a higher level of satisfaction within the group who valued and uses e-business service. This finding further suggests that banks in Serbia should rethink customer switching patterns from incumbent model to e-business services, to improve customers' satisfaction and shareholder value, respectively. If banks decide to pursue that strategy, there is a huge probability that customers' switching behaviour will change banking business landscape in years to come.

Finally, the study reveals the main obstacles of taking full benefits of e-business in banking, perceived from customers' perspective. According to the opinion of customers who prefer to use on-site banking, key barriers for e-business services adoption lie in the lack of safety, inadequate knowledge to use new technologies and insufficient trust into e-banking services. On the other hand, the group of customers who favour using e-business services have found that data security, e-business service quality and deficiency of ATMs represent major

issues for taking all the advantages internet-based technologies provides. This finding further facilitates a reconsideration of existing IT innovation strategies and the introduction of new measures towards effective outcome for both parties.

## **Conclusion**

Banking industry faces exceptional challenges imposed by the digital era. Besides many opportunities, the fourth industrial revolution brings many threats to traditional and well-established business models, which characterise the majority of banks that operate in Serbia. On the other hand, the banking sector in Serbia has gone through turbulent years that left numerous disadvantageous effects to the financial system and customers' behaviour and trust. Accordingly, this paper aims at examining the customers' readiness to accept digital disruptive technologies in banking, by exploring adoption rate of the internet-based technologies that are already matured at the market. Also, the study intends to research key reasons that hinder the full use of these technologies in banking sector of Serbia.

The research results depicted in the study disclose main findings that can contribute to both the theory and practice. In theory, study enhances the literature on the subject of digital disruption and technology adoption in banking sector in country's context that has been insufficiently explored so far. Regarding practice, the research findings can facilitate further development of business strategies and measures towards finding the perfect balance among all influential factors, which will satisfy all relevant stakeholders.

Despite its contribution, the study has some limitations that require future research. The first limitation refers to data collection. Data were collected from one country and single industry. Hence, future research should incorporate perspectives of customers from different industries in Serbia that are exposed to digital disruption. Besides, future research should involve cross-cultural exploration to examine further the similarities and differences in customers' behavior and their readiness to adopt disruptive technology innovations across the Balkan, sparingly examined region hitherto.

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## THE TOPOGRAPHY OF INTRA-ORGANIZATIONAL NETWORKS

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### Abstract

**Purpose:** The paper aims to clarify the topography of several networks of a public organization. It proposes to analyze the intra-organizational environment through the prism of knowledge, resource, and task flows as the main sources of innovation. The study aims to expand the domain of knowledge, resources, and tasks used and performed by the employees giving us the idea what the possible structure of those networks can look like.

**Design/methodology/approach:** The study involved a total of 82 employees of the public organization operating in the higher education sector (N = 82) out of 89 provided for testing, which is a total of 93% of respondents. According to the research network, the sample covered the entire population. We used an interview and a survey research composed of four questions. Also the Organizational Risk Analyzer (ORA LITE) software has been used.

**Findings:** The paper provides empirical insights into the topography of the particular networks and the analysis of the potential risks that might accompany a given network or too many network gaps in an intra-organizational environment.

**Research/practical implications:** The presentation of the topography of each network indicates the direction for management improvements related to the possibilities of underloading or overloading an individual employee with knowledge, resources, or tasks. It helps bridge the gaps in relationships based on inefficient flows of knowledge, resources, tasks, and it helps recognize some risks associated with too dense network that is not conducive to innovation.

**Originality/value:** This paper satisfies an identified need to study how knowledge, resources and tasks, which are the main sources of innovation, may flow within an organization and what the network structure of the organizational and the two-mode network is.

**Keywords:** Topography, Network, Organizational network analysis, Public organization, Innovation

**JEL Codes:** D85, L21, L86

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## **Introduction**

Organizational network analysis (ONA), which is an extension of classical social network analysis (SNA) apart from actors (humans), covers a number of other nodes (non-human), such as knowledge, tasks or resources used in an organization. These resources are crucial to generate innovation in any organization. Innovation lies in the development and implementation of new ideas to solve problems, the essence of which involves the use of information, knowledge and skills in a new way. According to Van de Ven (1986, p. 591) innovation is a new idea that can be a recombination of old ideas, the scheme that challenges the present order, pattern or a unique approach that is perceived as new by the people involved. Organizations that obtain information from multiple sources are less likely to miss important information, which through a unique combination (merger) in a new way, create innovation. Social and/or organizational network analysis has become an essential research area in the management science, as it allows to analyze an organization from the perspective of relations and inter-dependencies between any network actors, who do not necessarily have to have human shape. Both SNA (e.g. Alvarez, Borsi, & Rodrigues, 2017; Leon, Rodríguez-Rodríguez, Gómez-Gasquet, & Mula, 2017; Vohra & Thomas, 2016; Wood, Kim, & Khan, 2016; Zheng, Le, Chan, Hu, & Li, 2016), and ONA (e.g. Cross, Kase, Kilduff, & King, 2013; Merrill et al., 2008; Merrill, Bakken, Rockoff, Gebbie, & Carley, 2007; Ujwary-Gil, 2016a) are increasingly used in various types of research. ONA in this research constitutes a sort of meta-network, which means it consists not only of actors, but also of the already mentioned resources, tasks and knowledge, which all may form network nodes.

In our article ONA is rooted in intra-organizational reality, is multi-modal and goes beyond the traditional SNA although in many aspects it is based on classical indicators of network measuring and its properties (for example network centralization). Thus ONA shall constitute SNA application in the organizational context, as descriptive and empirical-research method of mapping and measuring relations between people, knowledge and resources in an organization, used for accomplishing tasks. These interaction research which uses ONA is a promising tool for analyzing complex interactions occurring among network elements. Here, an organization is perceived through the prism of network and relations.

The main goal of this article is to provide empirical and descriptive analysis of the complexity of the network and its topography from the perspective of spreading the network of knowledge, tasks and resources, which constitute elements of complex indicators that will be

defined in further sections of the article. Thus, we will be able to provide an answer to the main research question, namely:

- What is the structure (topography) of defined networks which are the object of our analysis, composed of: knowledge network, resource network and task network, and what influence do they exert on the general operation and innovativeness of an organization?

## **1 Research method**

The research covered in total 82 employees of a public organization operating in the higher education sector (N=82) out of 89 employees intended to be analyzed, which constitutes 93% of the surveyed<sup>48</sup>. According to the assumptions of network research<sup>49</sup>, the sample covered the whole population. We used an interview and a survey questionnaire composed of over 10 questions (for the needs of this article we only used 4 questions). The questions were developed with the 5-point Likert scale, which was then dichotomized. In the matrix concerning communication between actors (discussing problems) strong relations (4 and 5) were taken into account and the value of 1 was assigned to them. The 1-3 point answers were given the value of 0. The matrix developed in this way was used for calculations, using the measures defined in Table 1 below<sup>50</sup>.

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<sup>48</sup> It is essential for this type of network research that the participation of respondents is full. In this case people who did not participate in the research were on leave or were temporarily absent from their place of employment.

<sup>49</sup> More on the legitimacy of the sample choice using the social network analysis can be found, inter alia, in (Borgatti, Everett, & Johnson, 2013).

<sup>50</sup> Both the dichotomization (transforming the matrix into a binary form of 0 and 1, where 1 denotes a relationship, whereas 0 denotes its lack) has already been the subject of research procedure. Detailed justification of such action can be found in (Merrill et al., 2008; Merrill, Bakken, Rockoff, Gebbie, & Carley, 2007).

**Tab. 1: The measures of organizational network analysis<sup>51</sup>**

Network level		
Measures	Definitions	Input data
Total density	The number of links divided by the number of possible links not including self-reference	AA, AK, AR, AT
Total degree centralization	Specifies the relative dominance of a single node of the other in the network measured by the number of direct links with the other actors.	AA
Knowledge diversity	The distribution of difference in knowledge. Characterizes the network in terms of how the items in a knowledge network (who knows what) are non-uniformly distributed across employees. This is one minus the Herfindahl-Hirshman Index applied to the normalized column sums of AK. This measures the degree to which knowledge is equally known by agents.	AK
Resource diversity	The distribution of difference in resources. Characterizes the network in terms of how the items in a resource network (who uses what) are non-uniformly distributed across employees. This is one minus the Herfindahl-Hirshman Index applied to the normalized column sums of AR This measures the degree to which resource is equally known by agents.	AR
Redundancy access	Average normalized number of redundant agents per resource. An agent is redundant if there is already an agent assigned to the resource.	AR
Redundancy assignment	Average normalized number of redundant agents assigned to tasks. An agent is redundant if there is already an agent assigned to the task.	AT
Redundancy knowledge	Average normalized number of redundant agents per knowledge. An agent is redundant if there is already an agent assigned to the knowledge.	AK

Source: Based on Carley, 2002; Carley & Yuqing, 2001; Jiang, Carley, & Eberlein, 2012; Wasserman & Faust, 1994. See also Ujwary-Gil (2016b).

For the needs of this research it is essential to define the most important network elements which are the object of our analysis, namely:

- 1) nodes – single elements of the network, that is agent (A), knowledge (K), task (T), resource (R) – see Table 2;
- 2) relations – the nature of ties between nodes: the flow of information, knowledge, activity (tasks), resources and their combinations;
- 3) networks – they can be described in form of graphs consisting of a set of nodes (N) and edges (E) joining nodes. In the network analysis, they will mostly be asymmetrical, as EUV relation does not necessarily equal EVU. The latter may not even exist (Jiang et al., 2012).

Within the instruments of ONA we used two forms of data presentation:

<sup>51</sup> The quoted measures on the level of the whole network and particular nodes and the subordinated measurement indicators have been discussed in detail in subject literature.

- Graphic visualization – whose aim is to visualize possible relations between actors, knowledge, resources and tasks and to locate the nodes in the network.

The graphic presentation takes into account the following networks (matrices) based on the survey questionnaire:

- 1) I contact this person in order to discuss and obtain help in solving problems related to performed work (A x A).
  - 2) I use the knowledge/skills in my work (A x K).
  - 3) I perform this task in my work (A x T).
  - 4) I use this resource in my work (A x R).
- Quantitative – whose aim is to measure the network properties based on selected indicators listed in Table 1. The visualization itself would not grasp the essence of a given network and could lead to the misinterpretation of data (the importance of a given node in the network in relation to others).

**Tab. 2: The basic nodes of the network in the public organization operating in the higher education sector**

	Knowledge and skills		Tasks		Resources
<b>K01</b>	Gathering collections	<b>T01</b>	Ordering and keeping a record of purchases	<b>R01</b>	Aleph
<b>K02</b>	Preparing collections	<b>T02</b>	Formal preparation of collections	<b>R02</b>	DLibra
<b>K03</b>	Scientific communication	<b>T03</b>	Subject preparation of collections	<b>R03</b>	Excel
<b>K04</b>	Making collections available	<b>T04</b>	Updating and correcting data in databases	<b>R04</b>	HAN
<b>K05</b>	Training needs	<b>T05</b>	Running traditional trainings	<b>R05</b>	Computers, laptops, terminals
<b>K06</b>	Conducting trainings	<b>T06</b>	Running e-learning trainings	<b>R06</b>	Information materials/tools (home page, leaflets, announcements)
<b>K07</b>	Accounting and administration	<b>T07</b>	Writing reports and accounts	<b>R07</b>	Moodle
<b>K08</b>	Logistics and human resource management (moving collections, selection)	<b>T08</b>	Editing the page (and materials uploaded there, such as bulletins, Facebook, blog)	<b>R08</b>	Omega-Psir
<b>K09</b>	Marketing and promotion activities	<b>T09</b>	Creating training programs	<b>R09</b>	e-mail
<b>K10</b>	Updating databases	<b>T10</b>	Quotation analysis	<b>R10</b>	Power Point
<b>K11</b>	Creating home pages	<b>T11</b>	Administering the home page	<b>R11</b>	Projectors
<b>K12</b>	Generating reports from databases	<b>T12</b>	Building the system of visual information	<b>R12</b>	Tools for creating bibliography, e.g. RefWorks, Zotero
<b>K13</b>	Film presentations	<b>T13</b>	Testing databases (access, content)	<b>R13</b>	SAP (working time records)

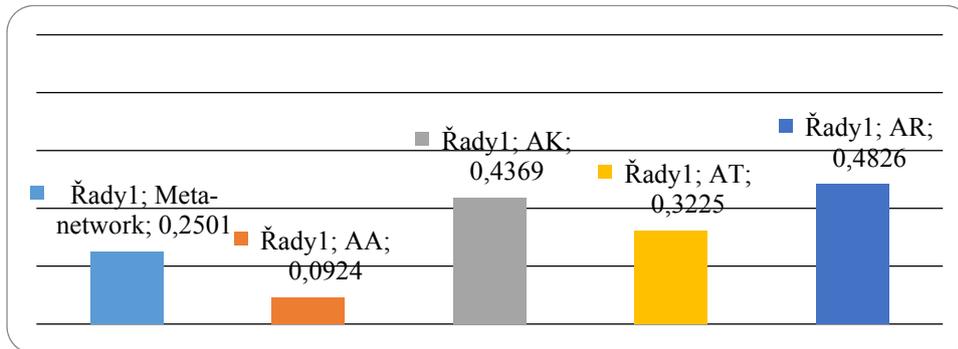
<b>K14</b>	PowerPoint presentations	<b>T14</b>	Informing about collections and services	<b>R14</b>	Servers
<b>K15</b>	Graphic skills	<b>T15</b>	Replies to inquiries	<b>R15</b>	Network (Internet connection)
<b>K16</b>	Quotation skills	<b>T16</b>	Providing remote access to electronic collections	<b>R16</b>	Code scanners
<b>K17</b>	Negotiating skills	<b>T17</b>	Creating bibliography, including full text bibliography	<b>R17</b>	Normative and legal acts (instructions, procedures)
<b>K18</b>	Basic skills of using: a computer and office equipment	<b>T18</b>	Preparing exhibitions	<b>R18</b>	Office appliances (fax, printers, phones, reprographic appliances)
<b>K19</b>	Library law, Main Library procedures	<b>T19</b>	Storing and protecting library materials	<b>R19</b>	Virtua
<b>K20</b>	Copyright issues	<b>T20</b>	Moving collections	<b>R20</b>	Word
<b>K21</b>	Resource management (selection, location)	<b>T21</b>	Selecting collections	<b>R21</b>	Status
<b>K22</b>	Creating databases	<b>T22</b>	Dealing with personnel matters	<b>R22</b>	Programs supporting collection purchase, e.g. Dawsonera, Azymut
<b>K23</b>	Using electronic sources of information	<b>T23</b>	Financial and accounting records	<b>R23</b>	Electronic sources of scientific information
<b>K24</b>	Scanning – processing digital files	<b>T24</b>	Fixed and current asset records	<b>R24</b>	Software for developing Main Library home page
		<b>T25</b>	maintaining e-mail	<b>R25</b>	Software for digitization
		<b>T26</b>	Building KHW	<b>R26</b>	Software for processing graphic files
		<b>T27</b>	Database administration and archiving		
		<b>T28</b>	Activities popularizing knowledge		
		<b>T29</b>	Servicing borrowings and reader accounts		
		<b>T30</b>	Field information (factual, normative, dedicated to particular groups of users)		
		<b>T31</b>	Digitization, creating digital documents		

Source: elaboration on the basis of the conducted interview.

## 2 Results

We will start the presentation of the results with the network density indicators, defining the ratio of the number of existing relations in the network to the number of all potential relations. Network density reflects the degree of interdependence and coherence existing between the nodes of an organization (actors, knowledge, resources, tasks). The higher the density the more complete the network or the degree of its networking but less chance to create innovative ideas and solve problems, especially in new and unexpected environment. The dense network means the tight relationship between actors within the same group, not necessary the new one, outside the networks, who could bring some new ideas.

**Fig. 1: Network density**



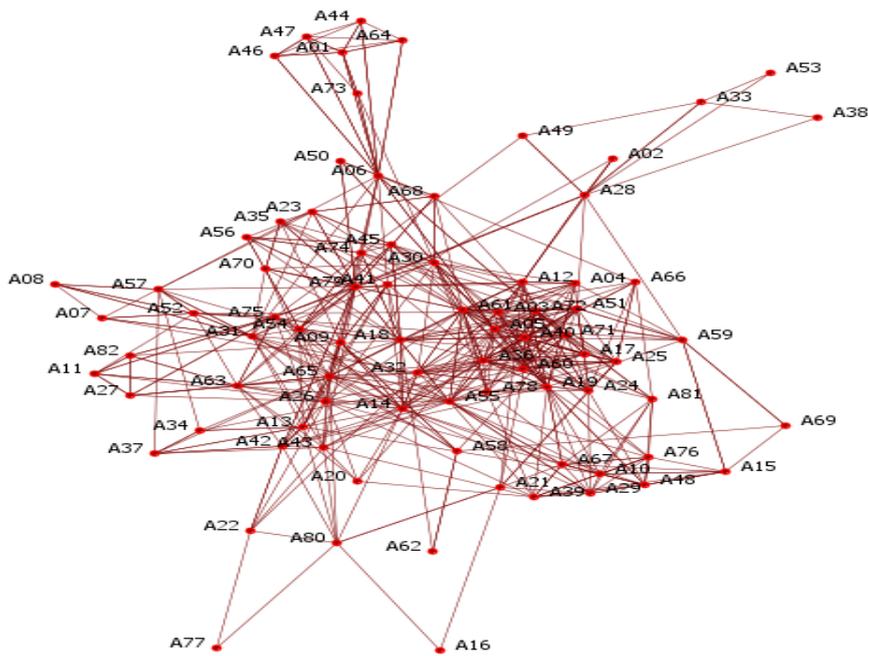
Legend: AA – actor/actor; AK – actor/knowledge; AT – actor/task; AR – actor/resource

Source: Own elaboration.

The highest density is achieved by AR network (0.4826), followed by AK (0.4369) and AT (0.3225). The above figures constitute, respectively, 48%, 43% and 32% of relations in a given network to all possible relations. At the level of 25% network density, there is a meta-network which defines the complexity of the whole network and covers all relations between AA, AK, AR, AT. The AA network has a relatively lowest networking value of 9%. We can assume after Parise (2007) that network density in the range of 15% - 20% should be identified with an effective exchange of information and ideas in a network comprising 100 actors. In our case the number of network actors is 82 people. The meta-network has the relationship density slightly above the optimal value, that is 25%.

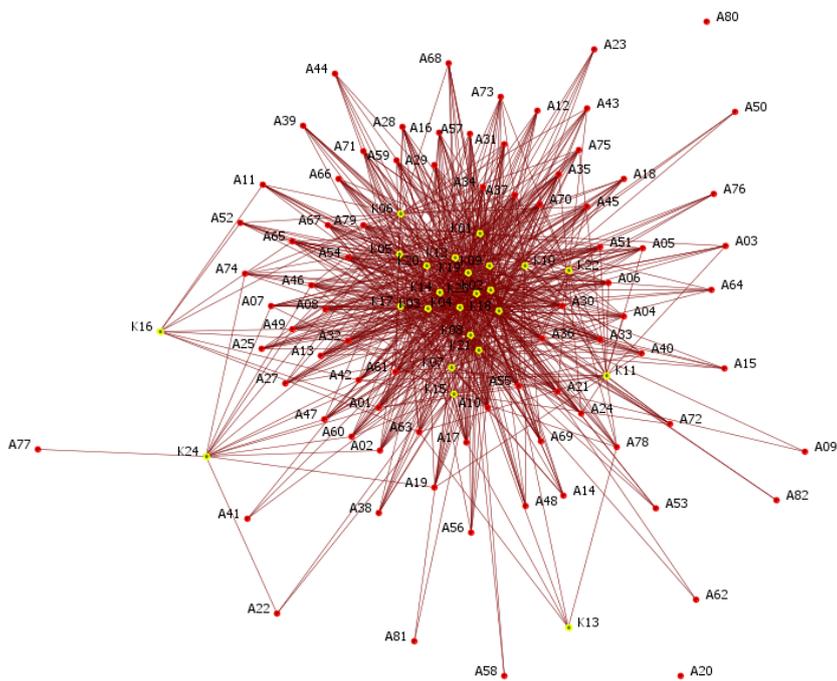
The figures below reflect the density (networking) of each network:

**Fig. 2: AA – actor/actor network**



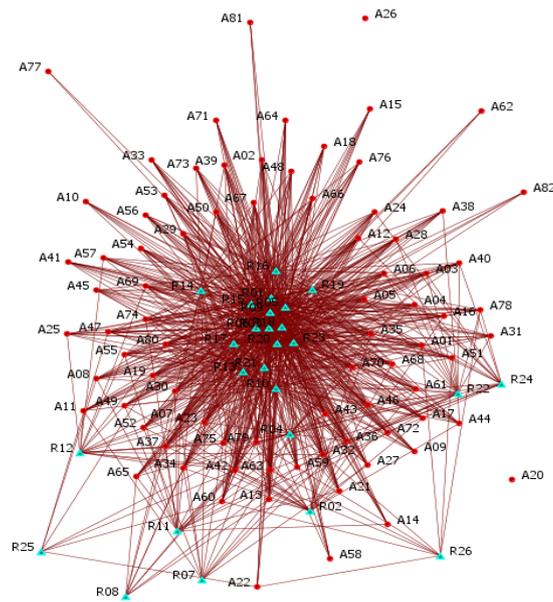
Source: Own elaboration

**Fig. 2: AK – actor/knowledge network**



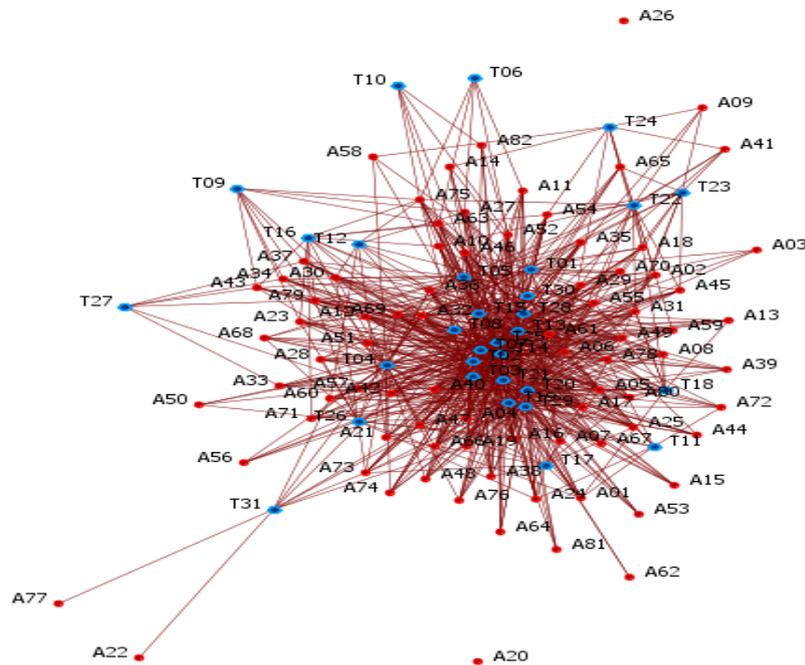
Source: Own elaboration

**Fig. 3: AR – actor/resource network**



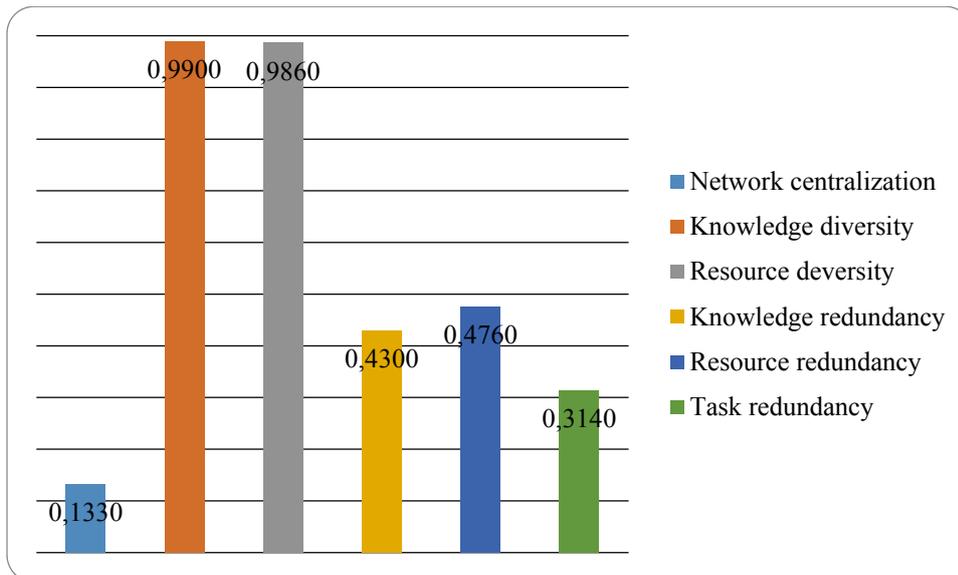
Source: Own elaboration

**Fig. 3: AT – actor/task network**



Source: Own elaboration

The Figure 2 presents the results for centralization, differentiation of knowledge and resources and the so-called redundancy:

**Fig. 4: Organizational indicators**


Source: Own elaboration

The figure presents structural characteristics of organization, which may affect decision-taking in an organization or planning future actions. Total network centralization is at the level of 0.133, which is 13%. It defines communication differences and dispersion. If all employees were connected with the central (main) node, its result would have to be 1. A result oscillating around 0.5 denotes network centralization. Network centralization indicates the fact that relations focus around the central node. Being central in the network (intra- or inter-organizational) managers are more likely to be exposed to the flow of tacit knowledge useful for innovation (Bell, 2005).

On the other hand, the differentiation of knowledge and resources is determined by the level of their distribution in an organization and whether they are equally allocated among the network actors. The differentiation indicators are very high ( $>0.9$ ), which may mean that only some employees enjoy access to knowledge and resources, while others have only limited access to them or do not have any access at all. Redundancy is of similar nature, as it determines the distribution of knowledge and resources. It also indicates the percentage of actors who have access to the same resources and tasks or use the same knowledge, which do not enable the development of organizational innovation. Redundancy of knowledge, resources and tasks is on a relatively medium level. Nevertheless, it still means that there are many actors with the same knowledge, who perform the same tasks or use the same resources, which is not effective. The more new knowledge, resources and tasks in organization between actors, the more chance

for innovation. This statement can be justified with the structural holes concept (see more Burt, 2004). The level of knowledge specialization may be higher than it is actually needed to perform tasks.

The distribution of knowledge and resources is very unevenly allocated in the analyzed AK and AR networks, which means that specific knowledge and resources are concentrated in the hand of a few people. The allocation of resources affects the effectiveness of organization's operations and innovativeness. The main external factors influencing allocation include: organizational structure, openness to innovations and changes as well as ways of utilizing employees' skills<sup>52</sup>. In the analyzed organization the indicator of knowledge and resource differentiation demonstrates inequalities in both knowledge and resource allocation. There is a risk that the work and the accomplished tasks depend heavily on a few people with the greatest knowledge and access to resources. These people may be overburdened. On the other hand, redundancy of knowledge, resources and tasks seems to be on a relatively high level. Approximately 43% of employees use the same knowledge, 48% use the same resources, whereas 31% perform the same tasks. From the perspective of an organization this may, however, be justifiable, taking into account the inability to delegate tasks outside, as they have to be performed within the organization, or the knowledge redundancy necessary for coordinating tasks in cross-organizational perspective.

## **Conclusion**

The presented density of AA network does not favor exchanging and sharing information, and knowledge, as the density of relations is a mere 9%. On the other hand, the organizational actors have bigger chance to communicate and share their ideas with the stakeholders (the external actors). There is a place for improvement consisting in initiating relations with employees who are the source of specialist knowledge, ideas, conducive to taking rational decisions from the organization's perspective. The dense network of relations ( $>0.5$ ) helps achieve better organizational effects and productivity due to the possibility of coordinating activities by teams (Reagans & Zuckerman, 2001). On the other hand, too dense networks of relations may lead to the situation in which network actors receive the same or similar information and its flow is usually connected with the same group of people (Granovetter, 1983), which can even stop its innovativeness. Then there is a risk of the so-called information silos and duplicating efforts, especially as employees may be unaware of the actions taken elsewhere, which are related to

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<sup>52</sup> We will be able to take a closer look at this in the next section concerning the analysis of particular nodes.

their work (Merrill et al., 2008). The centralization level oscillating around 0.5 is considered to be relatively high (Wasserman & Faust, 1994). In our measurements, centralization practically does not occur (13%), so there is no danger of the central group of actors possessing power and exerting influence over the whole network. It should be noted, however, that centralization itself may positively affect the organization's results since a central person or group usually integrates information and new ideas towards performing tasks (Scott, 2012).

It should also be remembered that too high redundancy of knowledge, resources or tasks leads to performing similar tasks rather than to cooperation. In the analyzed organization the level of those indicators seems optimal, taking into account the possibility of replacing absent employees on a given post by others, possessing similar knowledge, using similar resources or performing the same tasks. At this stage, however, it is impossible to determine the desirable level of redundancy which determines the effectiveness of organization's operations, since we do not know the redundancy level in similar organizations or those operating in the same sector.

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# NECESSITY DRIVEN ENTREPRENEURS. DOES UNEMPLOYMENT AND PRECARIOUS EMPLOYMENT LEAD TO INCREASING ENTREPRENEURIAL INTENTIONS AMONG YOUNG PEOPLE IN SPAIN?

Mihaela Vancea - Mireia Utzet

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## Abstract

**Purpose:** The article explores the relationship between unemployment and precarious employment, and young people's entrepreneurship in Spain. We focus on the effects of employment conditions (employed with permanent contract; employed with precarious contract; unemployed; and inactive) and employment experience (had ever been unemployed for more than six months; and has had a paid job for more than one year) on young people's intentions to start their own business or become self-employed. The role of socio-demographic factors, perceived self-efficacy, perceived desirability and risk taking are also analysed.

**Methodology:** The analyses are based on a cross-sectional representative sample, corresponding to the year 2016, of Spanish working young individuals aged 18 to 35 years (n=1678). Differences between individuals having or not entrepreneurial intentions were calculated for the overall sample and according to employment situation and employment experience variables. We used multivariate logistic regression models to assess the variables that predicted the entrepreneurial intentions and to test whether precarious working conditions are pushing factors towards increasing entrepreneurship. All analyses were stratified by gender.

**Findings:** The results show that besides behavioural attitudinal factors that seem to particularly influence the entrepreneurial intentions of Spanish young people, having a precarious contract or being unemployed for more than six months cannot be regarded as necessity-driven factors for increasing intentions toward entrepreneurship. Research/practical implications: Spain is one of the European countries with more self-employment in young people, especially since the onset of the economic crisis. The high unemployment rates and the increasing exposure of young people to precarious working conditions and temporary jobs may explain this increase in self-employment. Future research should explore what policy measures motivate young people's entrepreneurship in Spain and under what conditions this becomes an effective alternative to unemployment and precarious employment.

**Originality:** Entrepreneurship and entrepreneurial intentions have received a great attention from both policy actors and scholars during the last decades, mainly due to increasing unemployment among young people in most European countries. Positive perceptions of entrepreneurship and opportunity-driven factors have been particularly explored to account for higher entrepreneurship rates. Nevertheless, little is known about the necessity-driven entrepreneurs, meaning those individuals willing to become self-employed under unfavourable employment or economic circumstances.

**Keywords:** precarious employment, entrepreneurship, entrepreneurship intentions, young people, Spain

**JEL Codes:** M2, M1, L260

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## **Introduction**

The recent economic crisis has hit Spain particularly hard, leading to a significant increase in unemployment rates, mainly among young people. While youth unemployment rate of the EU-28 countries has increased from 15.5 per cent in 2007 to 20.3 per cent in 2015, the youth unemployment rate in Spain raised from 18.1 per cent in 2007 to 48.3 per cent in 2015, for both men and women ages 15 to 24 (Eurostat 2016). Specific policy measures have been introduced to promote young people's employability and thus reduce unemployment at both, European and national levels. Stimulating entrepreneurship among young people has become a suitable instrument of the active labour market policy to reduce unemployment and precarious employment (Carmona, Congregado, & Golpe, 2012; Congregado, Golpe, & Carmona, 2010; Costa, Caetano, & Santos, 2016).

Spanish politicians generally believe that entrepreneurship will create new sources of employment (new self-employed people as well as further jobs in the newly-founded firms) and these in turn will help reduce unemployment (Congregado et al., 2010). An increase in economic growth because of entrepreneurial activity is also expected. Nevertheless, empirical evidence shows that although entrepreneurship has increased during the economic recession, a considerable number of new entrepreneurs have a negative perception of business opportunities and they lack self-confidence in their own entrepreneurial skills (Kelly, Singer, & Herington, 2016). No opportunities and no skills entrepreneurship may be counterproductive in terms of economic growth and increasing employment as the quality of business ventures performed by these entrepreneurs is questionable. This type of entrepreneurs normally does not plan market expansion, have quite low job-creation ambitions and are more prone to encounter a failure in their entrepreneurial activity and thus become discouraged (Block et al., 2006; Caliendo, Fossen, & Kritikos, 2009; Mühlböck, Warmuth, Holienka, & Kittel, 2016).

During the last decades, the concept of entrepreneurship has been deeply studied from different disciplines such as sociology, economics and psychology. Psychological characteristics such as internal locus of control, propensity to take risk, self-confidence, need for achievement, innovation and self-efficacy have been associated with entrepreneurial activity. Socio-demographic variables such as age, gender, formal education also seem to influence entrepreneurship. Institutional and economic circumstances may also have an impact on individual decisions and serve as push or pull factors for entrepreneurial activity (Mühlböck, Warmth, Holienka, & Kittel, 2016). For example, favourable economic conditions may act as pull factors meaning drawing people to start a business, as prospects for successful business

and job creation are better. Economic recessions in turn may act as push factors by forcing people to entering entrepreneurship because of lack of other opportunities. Nevertheless, the actual effect of macro-economic conditions remains unclear: while economic downturns may promote entrepreneurship because of involuntary job loss and scarcity of vacancies, at the same time, people might be discouraged to involve in any entrepreneurial activity because economic downturns reduce profitability expectations (Thompson, 2011).

Overall, the entrepreneurial research is based on three main theoretical strands: the first one focuses on psychological and individual characteristics to identify the stereotypical entrepreneur (Simoes, Crespo, & Moreira, 2016); the second one emphasises the influence of exogenous factors like social, economic and political systems to analyse favourable and unfavourable conditions for the development of entrepreneurial intentions (Bosma & Schutjens, 2011; Ngoc & Huu, 2016); and the third one draws on behavioural approaches in order to better understand why individuals decide to start their own business (Krueger & Brazeal, 1994).

From the vast group of studies analysing the individual characteristics of entrepreneurs, the following findings emerge: women have a lower propensity to enter into self-employment (Bosma & Schutjens, 2011; Simoes et al., 2016) but, when they do, they are more likely to be necessity-driven entrepreneurs (Kelly et al., 2016); young people show higher preferences to become self-employed than older people (there is an inverted U-shape relationship between age and self-employment) (Kelly et al., 2016; Simoes et al., 2016); and individuals with entrepreneurial families or with close friends who own businesses, are more likely to develop entrepreneurial intention and activity (Bosma & Schutjens, 2011).

The theoretical strand that draws on the importance of macro-level push pull factors for entrepreneurial activity distinguishes between necessity driven (push) and opportunity driven (pull) entrepreneurship (Sheehan & Mc Namara, 2015; Williams, 2008). Opportunity driven entrepreneurs are positively motivated to become self-employed as they hold adequate individual characteristics such as risk-propensity, locus of control and a strong need for personal achievement (Brockhaus, 1980; Shane, Locke, & Collins, 2003). Necessity-driven entrepreneurs instead are forced to become self-employed because of unfavourable situational or personal factors such as work dissatisfaction or experiencing an unemployment spell (Sheehan & Mc Namara, 2015).

The most widely used behavioural model to explain entrepreneurial activity (Krueger & Brazeal, 1994) focuses on entrepreneurial intentions. It assumes that individuals become entrepreneurs because they believe that they have the capabilities and skills (perceived self-efficacy) to do this, and that the significant others think that becoming an entrepreneur is

desirable (perceived desirability). Beyond that, the propensity to act (Krueger & Brazeal, 1994) or the risk tolerance (Mühlböck et al., 2016) and a precipitating event may also influence the final formation of entrepreneurial intentions (Krueger & Brazeal, 1994).

In this article, we hypothesise that being unemployed or having a precarious employment can act as a precipitating or a necessity-driven factor for the formation of entrepreneurial intentions, even if the individual does not have a strong perceived self-efficacy and desirability, or a high-risk tolerance. There is one article that analyses if temporary workers have the competencies, intentions and willingness to become entrepreneurs and found that temporary workers do not consider entrepreneurship a clear alternative to their precarious working conditions (Costa et al., 2016). We aim to further explore this and we thus combine individual psychological characteristics such as risk tolerance with the Krueger-Brazeal model of entrepreneurial intentions (perceived desirability and perceived feasibility) and the necessity/opportunity driven approach in order to test our hypothesis.

**Objective.** The article explores the relationship between unemployment and precarious employment, and young people's entrepreneurial intentions in Spain. We focus on the effects of employment conditions and employment experience on young people's intentions to start their own business or become self-employed. The role of socio-demographic factors such as age, gender, level of education, marital status and caring responsibilities as well as of psychological characteristics such as perceived self-efficacy, perceived desirability and risk taking were also analysed.

## **Data and Methods**

### **Design, Population, and Sample**

The present study is based on data from a cross-sectional survey that was conducted in 10 European countries. In Spain, the survey was carried out between March 2016 and June 2016 with a representative sample of young adults between 18 and 35 years, living in Spain (n=1.826). An online access panel was used for survey implementation. The sample of young adults was randomly stratified and proportional to the general Spanish population in terms of geographical regions (NUTS 2), employment situation (employed, unemployed inactive), gender (male, female) and age groups (18-24; 25-29; 30-35). In this article, we excluded young people working as self-employed. The final sample size was of 1678 individuals.

## Measures and Variables

*Entrepreneurial intentions* were measured through the question “How likely it is that you will start your own business or become self-employed within the next three years?” Answers were recoded into a two-category variable: unlikely (0-5); and likely (6-10).

Young adult’s current *employment situation* was assessed by asking participants, “Which of these options best describes your employment situation in the last month?” Answers were grouped in three categories: employed; unemployed; and inactive. Employed young people were classified according to the *type of contract*: permanent contract and precarious contract (fixed-term contract and no contract). The *employment conditions* were assessed through an index constructed based on the type of contract and the current employment situation: employed with permanent contract; employed with precarious contract; unemployed; and inactive.

*Work experience* was measured through a dummy variable indicating if the respondent had ever been six or more months in unemployment, and a dummy variable indicating if the participant has had a paid job for one year or more.

*Social capital* was modelled via participants’ social networks, which was measured through an item asking if participants’ friends were self-employed.

*Perceived self-efficacy* was estimated through the question “Do you think that you have the skills and competencies to successfully start your own business?” (Yes-strong, No-weak).

*Perceived desirability* was assessed through the question “In Spain, those successful at starting a new business have a high level of status and respect”. Answers were recoded into a two-category variable: low (strongly disagree, somewhat disagree); and high (somewhat agree, strongly agree). *Risk tolerance* was measured through the question “Are you a person who tends to avoid taking risks or are you fully prepared to take risks?” Answers were then recoded into a two-category variable: low (0 to 5); and high (6 to 10).

*Education* was measured through the seven categories of the International Standard Classification of Education (ES-ISCED). We created a three-level category variable: low education (comprising ES-ISCED categories I and II); medium education (comprising ES-ISCED categories IIIa, IIIb, and IV); and high education (comprising ES-ISCED categories V1 and V2).

Finally, we included other *socio-demographic variables* such as gender, age, and marital status and caring responsibilities (married with caring responsibilities; married without caring responsibilities; separated/single with caring responsibilities; separated/single without caring responsibilities).

### **Statistical analysis**

Each variable of interest was described as sample counts and percentages. Crude differences between individuals having or not entrepreneurial intentions were calculated for the overall sample and were described and tested for significance using Pearson  $\chi^2$  tests according to employment condition and employment experience variables, as well as perceived self-efficacy, perceived desirability and risk taking. We used multivariate logistic regression models to assess the variables that predicted the entrepreneurial intentions and to test whether unemployment and precarious employment act as push factors towards increased entrepreneurship. All variables achieving significance at  $p < 0.01$  in the univariate analysis were introduced in the model. Two models were estimated: model 1, unadjusted; and model 2, adjusted for age (continuous). We present only the second model. All analyses were stratified by gender.

### **Results**

The study sample included 811 women and 874 men. A third of the total sample had tertiary education (33.5%) and almost a quarter had only primary education (23.6%). The majority was single or separated and with no caring responsibilities (61.1%). The employment conditions were approximately equally distributed: a quarter of respondents were working with a permanent contract; a quarter was working with precarious contracts; a quarter was unemployed; and a quarter was inactive. The majority of participants (67.4%) had experienced previous unemployment and more than a half (55.4%) had had a paid job for a year or more. Only a 5% of individuals had self-employed friends. The vast majority of young adults had strong perceived self-efficacy and high desirability (more than 70%, in both cases), and more or less half of them were risk-taking (52.2). Only 17.8% of participants presented entrepreneurial intentions. Compared to men, more women had tertiary education, were married and with caring responsibilities, had had a paid job for more than a year, and had less self-employed friends. In term of behavioural attitude variables, there were no significant differences. In Table 1, we present the profile of our sample by the variables analysed.

**Tab. 1. Sample variables by gender, n (%)**

		Women	Men
Total		811 (48.1)	874 (51.9)
<i>Demographics</i>			
Age groups			
	18 -24	260 (29.7)	260 (32.1)
	25 – 29	248 (28.4)	249 (30.7)
	30 – 35	366 (41.9)	302 (37.2)
Educational level			
	Low	187 (21.4)	211 (26.0)
	Medium	344 (39.4)	344 (42.4)
	High	343 (39.2)	256 (31.6)
Marital status and caring responsibilities			
	Married with caring responsibilities	128 (17.0)	72 (10.2)
	Married without caring responsibilities	45 (6.0)	37 (5.2)
	Separated/single with caring responsibilities	158 (21.0)	128 (18.1)
	Separated/single without caring responsibilities	423 (56.1)	470 (66.5)
<i>Employment conditions</i>			
	Working permanent contract	191 (22.0)	165 (20.3)
	Working precarious contract	211 (24.3)	222 (27.4)
	Unemployed	275 (31.7)	226 (27.9)
	Inactive	190 (21.9)	198 (24.4)
<i>Work experience</i>			
Had ever had a paid job for a year or more			
	No	366 (41.9)	386 (47.6)
	Yes	508 (58.1)	425 (52.4)
Had ever been unemployed for six months or more			
	No	289 (33.1)	261 (32.2)
	Yes	585 (66.9)	550 (67.8)
<i>Social networks</i>			
How many friends are: Running own business			
	None / a few	840 (96.2)	759 (93.6)
	Some / most /all	33 (3.8)	52 (6.4)
<i>Behavioural attitude variables</i>			
Perceived self-efficacy			
	Strong	366 (72.3)	377 (74.2)
	Weak	140 (27.7)	131 (25.8)
Perceived desirability			
	Low	147 (30.8)	116 (25.5)
	High	331 (69.2)	339 (74.5)
Risk tolerance			

	Low	425 (48.6)	381 (47.0)
	High	449 (51.4)	430 (53.0)
<i>Entrepreneurial intentions</i>			
	Unlikely	702 (82.9)	652 (82.0)
	Likely	145 (17.1)	143 (18.0)

In Table 2, we present the sample variables by entrepreneurial intentions and gender. In terms of sociodemographic characteristics, there were no differences between those having and not having entrepreneurial intentions. Women working with permanent contract were significantly more likely to become an entrepreneur compared with women working with a precarious contract, unemployed or inactive. Women who had a paid job for a year or more were also more likely to become an entrepreneur. Both, women and men who had entrepreneur friends were more likely to become self-employed, and those who presented strong self-efficacy and had a high tendency to assume risks, were more likely to become entrepreneurs.

**Tab. 2. Sample variables and entrepreneurial intention by gender, n (%). Differences tested for significance using Pearson X<sup>2</sup> tests.**

	Women			Men		
	unlikely	likely	p-value	unlikely	likely	p-value
Total	702 (82.9)	145 (17.1)		652 (82.0)	143 (18.0)	
<i>Demographics</i>						
<i>Age groups</i>						
18 -24	213 (85.9)	35 (14.1)	0.108	223 (86.8)	34 (13.2)	0.025
25 – 29	201 (84.5)	37 (15.5)		189 (77.5)	55 (22.5)	
30 – 35	288 (79.8)	73 (20.2)		240 (81.6)	54 (18.4)	
<i>Educational level</i>						
Low	163 (88.6)	21 (11.4)	0.012	160 (77.3)	47 (22.7)	0.04
Medium	279 (84.0)	53 (16.0)		293 (85.7)	49 (14.3)	
High	260 (78.5)	71 (21.5)		19 (80.9)	47 (19.1)	
<i>Marital status and caring responsibilities</i>						
Married with caring responsibilities	101 (80.2)	25 (19.8)	0.227	53 (73.6)	19 (26.4)	0.087
Married without caring responsibilities	34 (75.6)	11 (24.4)		27 (73.0)	10 (27.0)	
Separated/single with caring responsibilities	130 (87.2)	19 (12.8)		106 (86.2)	17 (13.8)	
Separated/single without caring responsibilities	337 (82.0)	74 (18.0)		377 (82.0)	83 (18.0)	
<i>Employment conditions</i>						

Working permanent contract	131 (72.0)	51 (28.0)		126 (77.8)	36 (22.2)	
Working precarious contract	171 (85.5)	29 (14.5)		172 (82.3)	37 (17.7)	
Unemployed	237 (86.2)	38 (13.8)		191 (84.5)	35 (15.5)	
Inactive	163 (85.8)	27 (14.2)	0	163 (82.3)	35 (17.7)	0.399
<i>Work experience</i>						
Had ever had a paid job for a year or more						
No	311 (87.1)	46 (31.7)		323 (85.0)	57 (15.0)	
Yes	391 (79.8)	99 (68.3)	0.006	329 (79.3)	86 (20.7)	0.042
Had ever been unemployed for six months or more						
No	224 (80.0)	56 (20.0)		203 (79.3)	53 (20.7)	
Yes	478 (84.3)	89 (15.7)	0.122	449 (83.3)	90 (16.7)	0.199
<i>Social networks</i>						
How many friends are: Running own business						
None / a few	686 (84.2)	129 (15.8)		624 (83.9)	120 (16.1)	
Some / most /all	16 (51.6)	15 (48.4)	0	28 (54.9)	23 (45.1)	0
<i>Behavioural attitude variables</i>						
Perceived self-efficacy						
Strong	257 (70.2)	109 (29.8)		271 (71.9)	106 (28.1)	
Weak	137 (97.9)	3 (2.1)	0	124 (94.7)	7 (5.3)	0
Perceived desirability						
Low	124 (87.3)	18 (12.7)		90 (81.8)	20 (18.2)	
High	260 (81.3)	60 (18.8)	0.138	273 (80.83)	65 (19.2)	0.889
Risk tolerance						
Low	377 (90.6)	39 (9.4)		337 (89.2)	41 (10.8)	
High	325 (75.4)	106 (24.6)	0	315 (75.5)	102 (24.2)	0

Table 3 presents the results of the logistic regression predicting the entrepreneurial intentions. The results show that for both, men and women, perceived self-efficacy and risk tolerance determine the entrepreneurial intentions. As higher the self-efficacy and risk tolerance, as higher is the likelihood of becoming an entrepreneur. Besides this, the participants' social capital is also significant; having friends running a business increases the likelihood of entrepreneurial intention. For women, working with a permanent contract or having higher educational level increases the probability of becoming an entrepreneur.

**Tab. 3. Logistic regression models for Entrepreneurial intention, women and men. Robust standard errors.**

Variables	Women			Men		
	B	SE	OR	B	SE	OR
Intercept	-1.77***	0.87	0.17	-1.97***	0.56	0.14
<b>Employment conditions</b>						
(Reference category: Unemployed)						
Working permanent contract	0.79*	0.34	2.21	0.19	0.23	1.21
Working precarious contract	0.2	0.35	1.22	0.01	0.21	1.01
Inactive	0.38	0.39	1.46	0.26	0.24	1.3
<b>Had ever had a paid job for a year or more</b>						
(Reference category: No)						
Yes	-0.08	0.34	0.92	0.23	0.22	1.26
<b>How many friends are: Running own business</b>						
(Reference category: None / a few)						
Some / most / all	2.27***	0.6	9.68	1.42***	0.18	4.12
<b>Perceived self-efficacy</b>						
(Reference category: weak)						
Strong	2.72***	0.61	15.14	1.88***	0.19	6.55
<b>Risk tolerance</b>						
(Reference category: Low)						
High	1.05***	0.27	2.86	0.86***	0.37	2.37
Age	-0.01	0.03	0.99	0.01	0.02	1
AIC	466.86			492.56		
Log Likelihood	-214.431			-263.380		
Deviance	428.86			492.56		
Num. Obs	505			508		

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05

## Conclusions

The aim of this article was to explore the impact of unfavourable employment or economic circumstances on individuals' willingness to engage in entrepreneurial activity. We thus focused on the effects of unemployment and precarious employment, in particular, of employment conditions and employment experience, on young people's intentions to start their own business or become self-employed.

In line with a previous study that looked at temporary workers and entrepreneurship (Costa et al. 2016), we found no clear empirical evidence in favour of necessity-driven entrepreneurship. This means that unfavourable situational or personal factors such as unemployment or precarious working conditions do not seem to force young individuals to

become self-employed. In spite that previous empirical evidence suggests that men are generally more likely to become opportunity-driven entrepreneurs than women because of different gender-related attributes such as self-confidence (Holienska et al. 2016), our findings contradict these results. They instead suggest that more educated, experienced and economically stable women are more likely to engage in entrepreneurial activity in comparison with men. Neither the working conditions nor the working experience seem to influence men's intentions to become entrepreneurs. This result might be explained by the increasing incorporation of the Spanish women in the labour market and their increased economic autonomy. The predominant dual-earning family model in Spain (Naldini and Jurado 2013) might thus explain this lack of intentionality in men to engage in entrepreneurial activity.

Nevertheless, our findings confirm behavioural theories that assume that psychological characteristics such as risk tolerance, perceived self-efficacy and perceive desirability positively influence young people's intentions to become self-employed. Theoretical assumptions that individuals possessing higher levels of human capital would report higher rates of self-employment are also confirmed as respondents with more self-employed friends were more likely to engage in entrepreneurial activity.

The main limitation of this study is that it relies on young people's intentions when analysing the relationship between unemployment or precarious employment and entrepreneurial activity. Many authors suggest that an action, in this case achieving economic self-sufficiency, requires not only an intention, but also active performance by the individual towards achieving success in work-related behaviour (Carsrud, et al. 2011; Frese 2009). A considerable share of people who have the intention to start a business can be classified as lethargic dreamers, as the declared intentions might be never followed by actions (Parker and Belghitar, 2006).

Nevertheless, the present study has two main strengths. First, it deals with a reasonably large sample, representative of the Spanish young population. Second, it provides an opportunity to deepen our understanding of the relationship between unfavourable employment situations and conditions on young people's willingness to engage in entrepreneurial activity.

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## NEW BUSINESS MODEL INNOVATIONS AND COLLABORATIONS TO SUPPORT THE CIRCULAR ECONOMY

Vesela Veleva – Gavin Bodkin

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### Abstract

**Purpose:** This paper will discuss the role of small entrepreneurial companies and business to business (B2B) collaborations to advance the circular economy (CE). The authors will share insights from a U.S.-based research project that examined the drivers, barriers and opportunities for advancing waste repurposing and product reuse/remanufacturing. Many large companies fail to incorporate CE principles into their business strategy due to costs, logistical hurdles and lack of mandates. This presents an opportunity for entrepreneurial companies with innovative business models to fill the gap and provide critical links for corporations in reverse supply chains while creating new business opportunities with social benefits.

**Design/methodology/approach:** The research is based on empirical study of six large corporations with zero waste goals and six entrepreneurs focused on product reuse/remanufacturing or waste repurposing. Some of the participating companies include Dell Technologies, Raytheon, Waste Management, First Solar, Circular Blu, and Seeding Labs. Data was collected through in-depth, semi-structured interviews with senior managers or founders. The study employs a theoretical model for developing a life cycle management strategy proposed by Sanchez et. al. (2004) and the circular business canvas model (Levandowski, 2016), wherein the authors analyze the emerging drivers, current barriers and future opportunities for business to advance the CE.

**Findings:** The study found that despite the lack of federal regulations in the U.S. a growing number of companies are forming partnerships to reduce waste and advance product reuse or remanufacturing. Key drivers for such trends include customer demands, corporate sustainability commitments and state-level mandates. Technology also plays a critical role in reducing transaction costs and supporting social-marketing strategies and partnerships. Research/practical implications: The study contributes to the research on the relationship between entrepreneurial innovation and the development of CE principles within corporate supply chains, a field that is still in its infant stage (Heshmati, 2015). The study offers valuable lessons for entrepreneurs interested in developing viable business models around product reuse, remanufacturing or waste repurposing. Future research should consider comparing B2B collaborations in the U.S. and Europe to analyze the similarities and differences in business strategies for advancing the CE.

**Originality/value:** This paper provides insights into a field that is still greatly underdeveloped – the role of environmental entrepreneurs entering a new market space based on collaborations with large corporations to advance product reuse/remanufacturing or waste repurposing that promote the circular economy.

**Keywords:** circular business models, environmental entrepreneurs, waste repurposing, product reuse, remanufacturing

**JEL Codes:** L26, Q56, O3

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## **Introduction**

The circular economy (CE) has recently been gaining traction in developed nations as both an alternative to the dominant “take-make-waste” model of production and as a key approach for addressing climate change issues. The European Union and China have led this movement by launching national CE strategies and action plans with concrete waste reduction goals and measures of success. This new paradigm of economic development requires innovation and new business models for advancing zero waste production, product stewardship, and product reuse and remanufacturing. World Economic Forum study in 2014 estimated that the circular economy will provide an economic opportunity of over \$1 trillion as well as significant social and environmental benefits. Most research to date, has focused on original equipment manufacturers (OEMs) taking back and remanufacturing old products. However, this option is often not viable for companies with global supply chains as the processing costs of remanufacturing can be higher than the selling price of new products. Similarly, manufacturers do not want to offer lower cost products which would erode profit margins (Matsumoto 2009; Veleva 2014).

The role of entrepreneurs in entering the market to provide critical links in reverse supply chains to advance CE is less explored (Heshmati 2015). Typically the transition to a circular economy requires addressing four fundamental business blocks: a) materials and product design; b) new business models; c) global reverse networks, and d) enabling conditions (Planing, 2015). The aim of this paper is to focus on the second and fourth building blocks while examining the following research questions: What are the main drivers behind the emerging CE entrepreneurs in the U.S. despite the lack of federal mandates? What business model innovations and collaborations are ensuring entrepreneurial success? What are the key challenges faced by entrepreneurs and corporations, and where do they see the greatest opportunities in the future?

The paper is structured as follows: it begins with a literature review, illustrating the consensus about the role of businesses (and entrepreneurs in particular) in advancing CE business strategies. It then introduces the research method utilized and summarizes the results from the study. The paper concludes with a discussion of key findings, main contribution and implications for future research and practice.

## 1 Literature review

The circular economy (CE) traces its origins to the concepts of “industrial ecology”, “cradle-to-cradle”, “biomimicry” and “natural capitalism” introduced by sustainability thought leaders in the last two decades. Such an economy is based on several main principles, including a) “designing out” waste, b) separating the biological from technical nutrients where the first are returned back to the biosphere, and the second are reused indefinitely, and c) using renewable energy to reduce dependence on resources and develop sustainable systems (WEF, 2014). China and the European Union are currently leading global efforts to enact policies, establish targets and measure progress towards the CE.

Transitioning to such an economic paradigm will require a fundamental shift in the *purpose* of business and how *value* is defined by companies and society. It will require new innovative actors who serve as intermediaries between large corporations and consumers and help solve environmental and social challenges (Ghisellini et. al., 2016). The CE requires the focus to shift from individual technologies towards creating new systems that are based on collaborations between accountable stakeholders. Sanchez et. al. (2004) identifies four conditions that can be used to frame the CE within companies – company conditions, product conditions, product chain conditions and society/market conditions. Planing (2015) sees three major changes that are driving this shift: a) increasingly volatile commodity prices; b) information technology which enables new business models and innovation, and c) changing consumer behavior toward performance and away from ownership. In this transition, business model innovation is seen as critical for advancing CE principles, however limited research exists on value capture and creation in this space.<sup>53</sup> Bocken et. al. (2014) introduced eight sustainable business model archetypes – maximise material and energy efficiency; create value from waste; substitute with renewables and natural processes; deliver functionality rather than ownership; adopt a stewardship role; encourage sufficiency; re-purpose the business for society/environment; and develop scale-up solutions. He argues that in a CE „value is no longer created by firms acting autonomously, but by firms acting together with parties external to the firm through informal arrangements or formal alliances“. Levandowski (2016) proposed a circular business canvas model and outlined the main challenges to overcome in the transition from a linear to a circular business model, including shifting the value proposition for consumers. The present research focuses only on product reuse, remanufacturing and waste

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<sup>53</sup> In this paper a business model is defined by three main elements: the value proposition, value creation and value capture.

repurposing and examines the factors for establishing successful B2B collaborations between large companies and CE entrepreneurs.

Most research on product reuse and remanufacturing to date has focused on large original equipment manufacturers (OEMs) taking back and remanufacturing old products. For OEMs, however, this model is not ideal as reused products can erode profit margins (Veleva 2014). Research has found that top drivers of product take-back by OEMs include regulations (e.g., European Union WEEE Directive), the viability of spare parts collection, brand protection, and consumer satisfaction (Matsumoto 2009). Profits are not a top driver of product take-back. In contrast, for the numerous small companies involved in waste repurposing, product reuse or remanufacturing, profit is of “paramount importance” as it is the “prerequisite for their survival” (Matsumoto 2009). Sharma et. al. (2010) finds that an important driver for product reuse and remanufacturing is the “growing segment of marginal customers who cannot afford new products now...but are interested in acquiring the product”. He believes there is a market segment that prefers remanufactured products due to their cost benefits, similar to the secondhand market for automobiles.

Companies exploring CE business models face many **challenges**. For OEMs key barriers include the complex logistics and cost of reverse supply chains and the lack of in-house capabilities and expertise (Veleva 2014). Entrepreneurs on the other hand, are primarily concerned about ensuring a constant volume of used product/waste as well as customers for the remanufactured products in order to sustain their business and profits (Matsumoto, 2009). Overcoming customer perceptions is often a major challenge; research has found for instance that especially in India, remanufactured or secondhand products are often considered unsafe or unreliable. Entrepreneurs face numerous additional barriers including lack of access to funding, mentorship, networks and government support, reliable data and tools to measure and communicate their value proposition (Rizos et. al. 2015). Finally, the lack of supporting policies and the taxation of labor rather than raw materials has also been identified as a major barrier to remanufacturing and product service systems.

## 1.1 Study design and method

The study is based on interviews with twelve U.S.-based companies – six entrepreneurs focused on product reuse, remanufacturing or waste repurposing, and six large companies with commitments to zero waste and/or circular business practices. The entrepreneurs included Circular Blu, The Furniture Trust, Seeding Labs, Save That Staff, Preserve and Rise. They represent both for-profit and non-profit organizations from diverse sectors in different stages of

development. Participating corporations were also selected from diverse sectors and included: Biogen, Raytheon, First Solar, Dell Technologies, PerkinElmer and Waste Management. Data was collected between October 2016 and March 2017 using publicly available information and in-depth, semi-structured interviews with senior managers and founders (in the case of entrepreneurs). Each company participated in one interview (in person or by phone). The interview protocol was developed based on a literature review and feedback from a colleague with extensive entrepreneurship expertise. It included two frameworks for analyzing the data and answering the research questions: a) the Sanchez et. al. (2004) framework for examining the feasibility of circular economic business strategies, and b) the Levandowski (2016) framework for integration of CE principles into business models. All interviews were audio-recorded and transcribed for accuracy. The empirical data was managed through cross-case analyses using methodology described in Eisenhardt (1989). The primary goal of the study design was to select a diverse group of companies in order to examine whether there are common drivers, barriers and future opportunities with CE adoption as seen by participating companies. The authors focused primarily on B2B collaborations between large corporations and entrepreneurs as these relationships provide valuable insights into inter-company dynamics by which a broader value network is defined that can help articulate new business models.

## 1.2 Results and discussion

Table 1 provides a summary of the key findings from the interviews in four areas: value proposition and partnerships, top drivers, key challenges, and future opportunities for advancing CE practices. For both entrepreneurs and large companies establishing long-term **partnerships** with key players in their supply chains is critical for establishing a viable business strategy. For instance, Dell Technologies leverages its partnership with Goodwill® to ensure low costs and streamlined collection of used electronics in order to meet its closed-loop manufacturing goals. The Furniture Trust's partnership with large companies like Biogen, Vertex, and Liberty Mutual, ensures constant supply of high quality furniture that can be donated to non-profits. Circular Blu's partnership with waste haulers like Save That Stuff helps ensure scalable quantities and quality of raw material (clean sterilization wrap) separated from the municipal solid waste stream. Partnerships with healthcare organizations like Halyard Health ensure a market for their products (repurposed tote bags). For recycling company Preserve, partnerships with materials processors ensure a continuous supply of raw material (post-consumer polypropylene), where its partnerships with retailers such as Whole Foods and Target ensure a sales channel as well as low cost/high quality raw material (through drop off

programs). This confirms previous findings that in sustainable consumption systems there are no longer „up“ and „down“ streams but rather a network of interactions and value exchanges, which leads to blurred lines between production and consumption (e.g., users of products become suppliers to entrepreneurs who repurpose these products to sell again). In this process **technology** enables companies to optimize logistics, reduce the costs of storing and shipping (e.g., in the cases of Seeding Labs, Furniture Trust, Rise), leverage low cost marketing (e.g., Preserve and the digital marketing firm EcoSphere) and educate customers (Dell Technologies, SaveThatStuff), confirming Planing (2015) findings.

In all cases the **CE value proposition** goes beyond a simple ROI to incorporate the environmental and social benefits of such actions. All entrepreneurs confirmed they cannot compete with inexpensive imports from China on the basis of cost alone even when they are able to offer competitive pricing. Local sourcing is becoming increasingly important to large corporations, hospitals, and universities and becoming a key part of the CE value proposition by Save That Stuff, The Furniture Trust, Circular Blu, Rise, and Preserve. Some entrepreneurs take unwanted equipment or waste for free (CircularBlu, Seeding Labs), while others are charging for such services (The Furniture Trust, SaveThatStuff, Rise). Non-profit organizations such as Seedling Labs and The Furniture Trust rely on grants and corporate underwriting to supplement revenues; others such as Circular Blu, Rise and Preserve capture value based on customers willingness to pay for a product that is both high quality and socially/environmentally responsible.

The research revealed that **regulations** are a top driver for CE strategies. Despite the lack of U.S. federal mandates, European Union regulations (e.g., WEEE, RoHS, REACH and CE policies) and state laws (e.g., take-back mandates and bans) influence global corporate behavior and create new market opportunities. For instance, the 2014 Massachusetts Organic Waste Ban has led to significant food donations and composting organizations, associated with significant direct and indirect economic benefits such as 150% increase in employment and \$175 million increase in economic activity in the state. **Corporate sustainability commitments and zero waste goals** are another important driver for CE strategies which confirms previous research (Veleva 2014). For companies like First Solar and Dell Technologies, **access to raw materials** and product design and modularity is also an important factor behind product take-back and remanufacturing.

The main **challenges** reported by both entrepreneurs and corporations include the costs associated with creating new systems, complex product design, lack of awareness of available options, lack of regulation, and lack of market demand. Entrepreneurs face additional

challenges such as access to financing to scale up operations, lack of brand awareness and supplier leverage, difficulties competing on cost alone and the lack of effective metrics to communicate social and environmental impacts to build stronger value proposition, which confirms previous studies (Rizos et. al. 2015). For some companies such as Biogen, articulating a vision of the CE and how it aligns with their zero waste goal is challenging. Logistics and technical issues were reported by several companies including Rise, Waste Management and First Solar.

The research revealed that most companies see increasing regulation (globally and locally) as the greatest **opportunity** in the future. Growing customer awareness and demand through voluntary programs like LEED, NSF International and Practice Greenhealth, are also seen as creating CE opportunities. Adoption of green chemistry to eliminate hazardous materials, stricter packaging standards, and modular product design were cited as critically important to scale up current practices. The heightened awareness and interest by young employees and increasing zero waste commitments by cities and companies are also expected to support business strategies in waste repurposing, product reuse and remanufacturing.

**Tab. 1: Summary of top drivers, challenges and opportunities for implementing CE practices by participating companies**

	Sector/ type	Revenues/ Yr founded	Value proposition/ Partnerships	Top drivers	Key challenges	Future opportunities
Biogen	Biotech (Public)	\$11.4 billion	Seeding Labs and Cambridge Scientific for R&D equipment reuse; Furniture Trust for surplus furniture: industry association PPSWG; partnership with Millipore to develop reusable packaging	State take-back legislation (e.g., California law about sharps and drugs take back); reputation; doing the right thing; ESG investor pressures	Aligning current zero waste goals with CE vision; time and cost as barrier to reuse/ remanuf.; lack of guidelines; lack of federal mandates; challenges measuring impacts (e.g., PIE, social)	Green chemistry to reduce chemical use; upcycling opportunities (e.g., good quality plastic waste); develop reusable packaging, bio plastics
Dell Technologies	Electronic equipment (Private)	\$56.9 billion	Goodwill partnership for electronics take-back; supplier for regrinding plastics; partnership with aerospace industry to take carbon fiber (industrial waste) for use in notebooks; corrugated paper back to vendor; leasing of products in commercial space.	Building resilient supply chain and reducing risk; customer demands for recycled plastics; ESG investors and NGOs pressures for product take-back; EU waste directive to incorporate CE principles	Fast changes in software – how you design for that? Material substitution causes challenges with competition, resiliency, and longevity; scalability – how to get competition to adopt; lack of suppliers who can meet CE needs; lack of federal mandate.	For 2 years working on closed loop plastics and carbon fiber recycling; green labeling and certifications (Dell products have; EMC next year); DfE and modularity; design for disassembly (already hapenning at Dell).
First Solar	Solar energy (Public)	\$2.95 billion	Industry association IRINA; lobbying and discussions with EU officials; member of NSF International working group on Sustainable PV standard	Upper management support, EU mandates, access to rare raw materials (tellurium)	Costs of take back & recycling; logistics of take back; lack of market for recycled materials.(glass, polymers)	Increasing mandates for reuse and recycling (EU, Japan, Canada); new NSF standard for sustainable PV; significant increase in old PV by 2050.
PerkinElmer	Biotechnology (Public)	\$2.1 billion	EARN (European Advanced Recycling Network) to recycle waste equipment in EU	EU regulations (RoHS, WEEE and REACH); customer demands (pharma companies with	Complex logistics; low awareness and demand from customers; many competing priorities and	High interest by new employees; software and IT as enabler (e.g., in tracking

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				CSR; new product features to ↓ energy use, chemicals)	limited resources; compliance oriented.	materials, products, software upgrades to extend use)
Raytheon	Defense (Public)	\$24 billion	ERI for electronics waste reuse and recycling; E.L. Harvey (recycling and composting)	Upper management; sustainability goals and commitments (e.g., zero waste certified sites); state mandates (e.g., Organics Ban in MA); EU REACH	Design changes and LCA difficult due to products complexity; lack of customer demand (DoD has goals but poor implementation)	Increasing regulation globally; customer demand; address chemicals and supplies (e.g., Finish waste-to-energy facility)
Waste Management	Waste management (public)	\$13.6 billion	Shift to selling services; IT to improve logistics (e.g., optimize truck routes, monitors on compactors); partner with SaveThatStuff, supplier audits for contamination.	State regulations (e.g., MA Organics Ban), customer demands, disposal costs, CSR goals including zero waste	Technical issues (complex/mixed packaging)	Need for standardized packaging (providing input to packaing industry to improve design; role for Walmart).
Circular Blu	Healthcare (Private)	2014	Partnership with local waste haulers to take clean sterilization wrap from hospitals. . Partnership with Halyard Health and other large companies to sell products. Partnership with disability charity as social impact commitment. Reduces hauling costs for hospitals.	Need to fill the gap between hospitals and landfills and help reduce waste; CSR commitments of large customers Healthcare pressured by NGOs to reduce waste.	Lack of regulation; lack of awareness; need to separate material, hospital logistics and space issue; product cost compared to Chinese imports; lack of social impact metrics; access to financing; lack of supplier leverage; lack of brand awareness.	Forming strategic partnerships (e.g., with organizations hiring people with disabilities); working with GPO for the healthcare industry; increasing brand awareness
Furniture Trust	Furniture (non-profit)	2008	Long-term partnerships with companies e.g. Vertex, Biogen, Liberty Mutual (support CSR goals). IT and data management help improve logistics and eliminate warehouse need	Companies' sustainability commitments; LEED raised awareness and served as a driver for waste reduction	Lack of regulations; shifting focus to WELL standard; higher costs; challenges measuring social impacts; lack of resources and brand awareness.	Partnerships with manufacturers and dealerships; modularity and standardization; increasing awareness of LEED and the full range of impacts of waste elimination.

## Innovation Management, Entrepreneurship and Sustainability (IMES 2017)

Preserve Products	Recycling (private)	1996	Partnership with 2-3 materials processors. Partnerships with retailers (Whole Foods, Target now) and companies (Stonyfield). Leveraging digital marketing (EcoSphere).	Increasing awareness about env. and health benefits of recycled products; state mandates (e.g., Organics ban in MA) creates market; declining costs of biobased plastics.	Higher products price. Lack of interest from large companies, consumers. Lack of funding and time to do good measurement (e.g., LCA, social impacts)	Investment in better recycling technology (e.g., optical sorting) to improve quality of collected plastic. Operate in 18 countries; expanding in Europe.
Rise	Food (private)	2016	Lower disposal costs for breweries; offer new healthier product for bakeries; partners with local breweries, bakeries, retailers; leverage IT for online marketplace and logistics	Social responsibility of partners; zero waste goals and local sourcing; cost savings; health conscious consumers	Access to financing; need to scale up to reduce product cost; lack of consumer awareness; need for better measurement	Business incubators (e.g., member of Food X); increasing commitments to zero waste; partnership with retailers; growing demand for local products
SaveThatStuff	Waste management (private)	1990	Better customer service; help address meet CSR goals (e.g., using local companies); partnership with WM and others to use anaerobic digestors, composting	State regulations (e.g., on organics waste); customers' goals of zero waste; cost savings vs. disposal (e.g., styrofoam)	Struggle with metrics (to communicate impacts); access to financing; complex products not possible to recycle; fluctuating commodity prices	Price not top factor; long-term partnerships with customers (e.g., Whole Foods); shift to advising customers how to get to zero waste
Seeding Labs	Biotechnology (non-profit)	2007	Partnership with 3rd party logistics company for managing products (flexibility, cost reduction); takes surplus R&D equipment for free and sends to developing countries. Working with 40 universities mostly in Africa. IT is key to business model.	Companies CSR commitments and employee engagement.	Lack of regulation. Financing (equipment program covers 40% of costs; grants for rest). Challenging to forecast supplies (need diverse donors). Lack of meaningful metrics (FMV is not meaningful).	Looking to expand in Europe which has more mandates; building relationships with companies is essential. Strategic sourcing of equipment.

## Conclusion

This study demonstrates that several factors are driving the emergence of CE business models and collaborations despite the lack of federal mandates in the U.S. These include: a) state laws and European Union directives, b) municipal and corporate sustainability commitments and zero waste goals; c) consumer demand, d) price insecurity within virgin materials markets, and e) entrepreneurial innovation. Entrepreneurs are leveraging technology to launch innovative partnerships with large corporations that create value for their partners and society through reduced costs, risks, improved reputation and social impact. Their future growth and success, however, requires financial, administrative, and educational support.

Advancing CE practices requires redesigning products and packaging to eliminate toxic chemicals and promote ease in disassembly and recycling. Scaling up the market-driven changes will require the collaboration of numerous stakeholders such as governments, NGOs, academic institutions, large companies, entrepreneurs and consumers. Finally, there is a need for government leadership in shifting procurement policies and helping to decouple profits from resource consumption.

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## KNOWLEDGE-GENERATION STRATEGIES IN THE REAL SECTOR OF THE ECONOMY: RUSSIAN CASE

Maxim Vlasov – Svetlana Panikarova

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### Abstract

**Purpose:** The main purpose of the study is to identify and to characterize the strategies of knowledge generation in the real sector of the Russian economy. Within the framework of the research, authors answered the following questions: 1) Which factors define the choice of knowledge increase strategy? 2) Which types of knowledge increase strategies are mainly used by Russian manufacturing companies? 3) How does the knowledge increase strategy influence company performance?

**Design/methodology/approach:** The methodology of a research included several stages. At the first stage the 120 enterprises has been conducted by means of the database of the Russian enterprises «Fira Pro». At the second stage, the 7 focus group interviews (in which about 4 experts participated) have been hold with heads of the enterprises, which are selected for a research. The third stage has included a 17 series of the structured interviews with R&D directors of the innovative enterprises.

**Findings:** Firstly, authors offered the company knowledge strategic management model for activating of knowledge generation in the economy. Secondly, authors offered the typologies of increase knowledge strategies included four types of strategies: borrowed knowledge strategy; copied knowledge strategy; knowledge imitation strategy; knowledge generation strategy.

**Research/practical implications:** In article authors proved that the optimum structure of costs of different types of knowledge has prime value for the effective innovative development of the enterprises, especially in difficult economic conditions. Strategic management of knowledge gives the greatest effect in the achievement of competitiveness if this management relies on the basic strategy of the enterprise, and considers its purposes and the directions of growth.

**Originality/value:** The research expanded methodological tools of the knowledge economics theory. Authors offered the knowledge increase strategies and their main characteristics, which will be useful for companies planning the innovative development.

**Keywords:** strategy, knowledge management, resources

**JEL Codes:** O30, O30

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## **Introduction**

In modern economic conditions, a knowledge defines the development of economic systems. Knowledge and generation of knowledge are the major factors defining competitiveness of economic subjects and stimulating economic development of the country. Scientists of the many countries have joined in a research of regularities of knowledge development economy. F. Machlup and Umesao coined the term «knowledge economy» in the 60s in the USA and Japan simultaneously, the authors having gained the worldwide recognition for the research into the dynamics of high-tech industries. In his further works, Machlup proved the importance of the new knowledge generation for the economic activity development of economic agents (Machlup, 1962). The scholars of the Austrian economic tradition Hayek (Hayek, 1945) and Shumpeter (Shumpeter, 1952) did admit the significance of new knowledge in economic processes. However, they believed them «subjective», impossible to describe the processes of new knowledge creation. Machlup and Scheler focused on the possibilities of using the knowledge in different spheres of economy.

Considerable part of scientists recognizes the importance of a research of knowledge management strategy.

## **1 Theoretical framework: knowledge management strategies**

*Knowledge management strategy* is the functional strategy, which is in fact resource the program for ensuring basic strategy. It includes a complex of actions and programs for spheres and branches within the knowledge management system, a certain set of the procedures, technologies, and practices which are mainly used in relation to knowledge of the enterprise.

Seibert with colleges presented a model of knowledge creation, transfer, and adoption based on theories of creativity and social networks (Seibert et al, 2017). The main finding of the paper by Fernandes and colleges is that technology-based incubators strategies focusing on the supply of knowledge assets and the creation of relationship assets are more effective than strategies focused only on the supply of physical infrastructure for firms located in incubators (Fernades et al, 2017).

In scientific literature, several typologies of knowledge management strategies are presented. In most cases, the following signs are used for classification of knowledge management strategies:

- *exogenous or endogenous knowledge* (Grant, 1996).
- *the level of influence of knowledge on activity of the company* (March, 1991).

- the *speed of distribution of new knowledge in the company* (Bierly & Chakrabarti, 1996).

- the *volume of the used knowledge* (Hamel & Prahalad, 1994).

The special case of knowledge management strategy can be considered the knowledge increase strategy.

*Knowledge increase strategy* is a set of administrative tools, which are used for increasing competitiveness of the company by means of new knowledge. (Panikarova & Vlasov, 2016).

Let us look at knowledge increase strategy typologies.

In the first case knowledge increase typology is made by P. Bierly and A. Chakrabarti on the basis of cluster analysis results of American pharmaceutical companies. The analysis used four variables: intensiveness of research costs, a strength of academic relations, a width of the database, a degree of knowledge change, a length of the production cycle (Bierly & Chakrabarti, 1996).

Because of a research, the companies were subdivided into groups according to the following strategy types: single, researchers, exploiters and innovators.

*Singles* are isolated from the point of view of knowledge increase. This is the least effective group from the point of view of research work output, costs are the highest, technology renovation cycle is the slowest and knowledge specialization is the narrowest.

*Researchers* create or buy knowledge necessary for supporting their competitiveness. Unlike other types, researchers demonstrate high performance in terms of changes made in the knowledge of the organization (radical knowledge).

*Exploiters* are the companies with the lowest expenditures on research and the highest performance in terms of relations with science (scientific knowledge). These companies mostly use own knowledge. They are more focused on increment training continuously strengthening their competitive advantages in a certain area. Exploiters have low research expenditures and narrowly specialized knowledge databases.

*Innovators* combine the best characteristics of researchers and exploiters. Innovators are the most aggressive and quick learners combining own and borrowed knowledge in an optimal way. They are focused both on radical and on increment training with short technological cycle (basic assets renovation cycle).

In the second typology suggested by Krogh (Krogh et al., 2001), two principles are used: 1) knowledge increase process: creation and transfer of knowledge and 2) field of knowledge:

new or existing. As a result, four types of knowledge generation strategies are identified: *strengthening, broadening, adaptation and research* (Fig.1).

**Fig. 1: Knowledge increase strategy**

		Knowledge increase process	
		Transfer	Creation
Knowledge area	Existing	Strength strategy	Expansion strategy
	New	Adaptation strategy	Research strategy

Source: own elaboration

The analysis of scientific literature shows, on the one hand, there is a wide systematic research of enterprises behavior during the creation of knowledge; on the other hand, there is academic interest to the problem of strategic planning of knowledge generation.

The purpose of the study is to identify and to characterize the strategies of knowledge generation in the real sector of the Russian economy.

Within the framework of the research, authors answered the following questions:

1. Which factors define the choice of knowledge increase strategy?
2. Which types of knowledge increase strategies do Russian manufacturing companies mainly use?
3. How does the knowledge increase strategy influence company performance?

## 2 Methodology

The methodology of a research included several stages.

At the first stage, selection has been formed. The general totality included 1530 industrial medium-sized enterprises of Sverdlovsk region with more than 100 employees. The selection totality included 120 enterprises, including: 27 metallurgical enterprises, 19 enterprises of mechanical engineering, 17 enterprises of chemical industry, 14 enterprises of power sector, 14 enterprises of food sector, 13 enterprises of mining industry, etc. This selection totality corresponds to structure of region manufacturing industry.

At the second stage, seven focus group interviews with executives (or R&D directors) of the enterprises, which are selected for a research, was carried out. Each focus group consisted of 4 experts in innovations at the industrial enterprises. The research was conducted between 06 June and 12 June 2016 within the INNOPROM 2016 - annual international exhibition of

innovative industries. During the session with focus groups the following aspects were discussed: Which strategies of new knowledge management are most commonly used by the company?; What are the costs of research work in the structure of overall company expenditures?; What amount of new products has been produced by the company during a year thanks to the increase of knowledge?; How does company profit depend on changes the expenditures on the growth of knowledge?

The third stage included a series of the structured in-depth interviews with heads of the innovative enterprises. The in-depth interviews have been conducted with 17 R&D director of the enterprises that are selected for a research. During the in-depth interview, details of innovative behavior of the medium-sized industrial enterprises became clear.

The results of the investigation have been processed by means of the special computer Statistica for Windows program, and analyzed by means of a statistical method for analysis of interrelations, and in particular the discriminant analysis.

The results of a research have been calculated with use of an author's quantitative method, based on the theory of innovative efficiency. The assessment of two group indicators of innovative efficiency is the cornerstone of a method. The indicators characterizing costs of researches and developments of the enterprise enter into the first group. The costs of change of information, human and material resources separately calculated. The indicators reflecting effectiveness of knowledge generation in a section of operational, structural and functional innovations are united in the second group. Further efficiency of knowledge generation for each type of knowledge was calculated.

### **3 Main results of the research**

#### **3.1 Factors defining knowledge management strategies**

A set of factors defining knowledge management strategies, presented on figure 2, can be divided into two groups: exogenous such as favorable or unfavorable environment factors and endogenous such as company potential and resources (Grigoriou&Rothaermel, 2017; Besen et al., 2017).

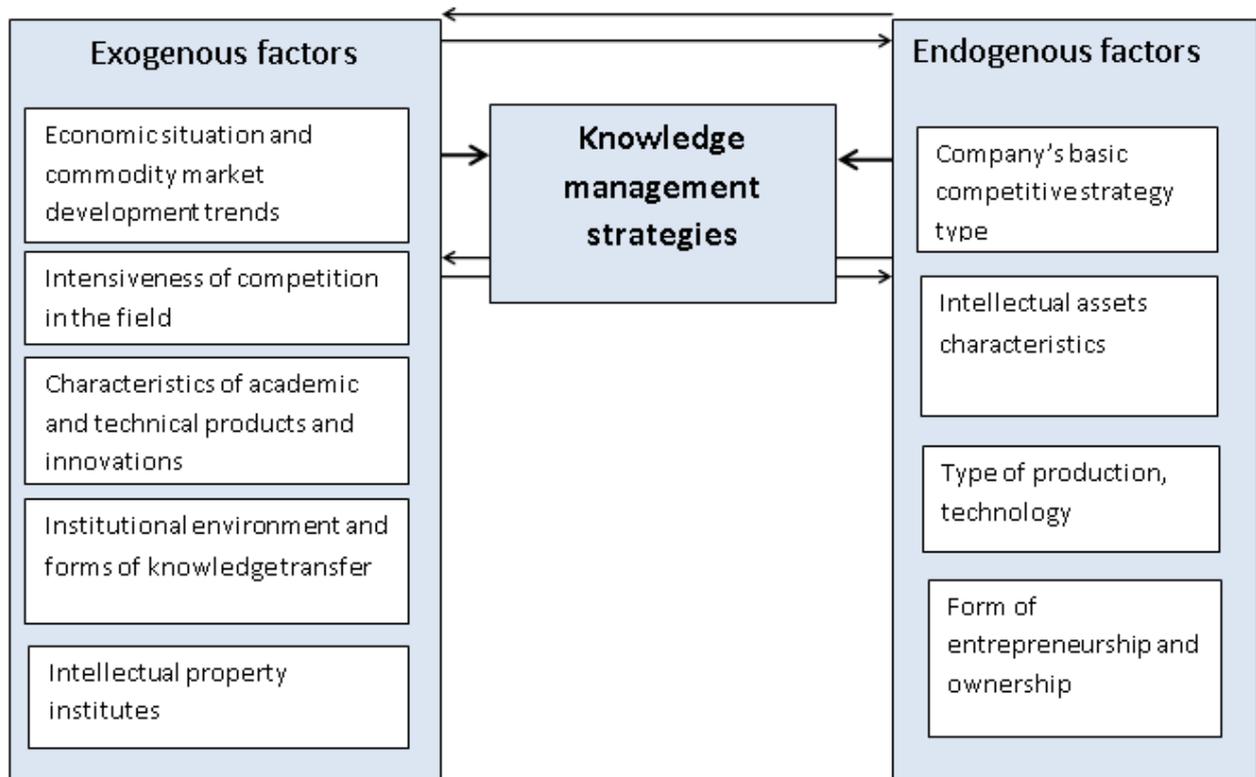
Exogenous factors include: general economic situation in the country, development trends at individual commodity markets interesting for the company; intensiveness of competition in the branch the company works in; characteristics of academic and technical products and innovations market, including market scope, balance between vendors and buyers, set of participants, quality of market institutions, capacity, etc.; institutional situation and

knowledge transfer forms, that is level of development of institutions supporting commercialization and import of knowledge; peculiar features of intellectual property institutes, including institutes of certification, evaluation, defense of intellectual property.

Endogenous factors include the type of company's basic competitive strategy; presence, scope and characteristics of intellectual assets able to provide the competitive advantage to the market; peculiar features of production and technological processes; type of entrepreneurship and form of ownership.

Knowledge management strategies are formed under the influence of endogenous and exogenous factors, as a result of entrepreneurs' adaptation to external environment and the use of internal resources. Knowledge management strategies depend on approaches to the following aspects of entrepreneurial activities: 1) sources of knowledge increase (internal/external) necessary for company development; 2) share of research work in the total expenditures of the company; 3) structure of knowledge used by the company; 4) desire to take a risk in knowledge generation process; 5) production renovation process; 6) innovation planning horizon; 7) means of defending intellectual property and now-how.

**Fig. 2: Company knowledge strategic management model**



Source: own elaboration

The strategy of knowledge increase reflects both structures of knowledge system as a resource of company's competitive strategy and also individual characteristics of company knowledge system. Therefore Fig. 2 demonstrates strategies in the center, emphasizing their dynamic character.

### 3.2 Typologies of increase knowledge strategies

Authors have developed the typology of knowledge increase strategy which is based on two principles: level of formalization and phase of knowledge life cycle:

- *Borrowed knowledge strategy*. The company buys necessary knowledge in the market of information.

- *Copied knowledge strategy*. The company copies methods using of resources from competitors, independently or with the consulting help.

- *Knowledge imitation strategy* at which the new product or technology is created during copying of production of competitors.

- *Knowledge generation strategy*. The company creates the new production and technology which doesn't have analogs in the market.

Because of conducted research, authors develop the classification of knowledge increment strategy allowing to systematize processes of knowledge generation by economic entities according to the general plan of development.

Authors have proved that there are several knowledge increase strategies, have revealed the main characteristics and distinctive features of these strategies (tab. 1).

**Tab. 1: Characteristic of increase knowledge strategies**

Strategy	R&D share to structure of the total costs	Quantity of new production	Profit growth due to knowledge generation
Borrowed knowledge strategy	less than 3%	Product renovation process is slow, generally due to operational knowledge	Structural knowledge influences profit slightly; the importance of functional and operational knowledge increases.
Copied knowledge strategy	3 - 7%	The release of new production increases. Structural and functional knowledge provides 80% of the release of new production.	Functional and structural knowledge has of great importance, operational knowledge has insignificant value.
Knowledge imitation strategy	7-10%	Structural knowledge plays a smaller role, functional and operational, on the contrary, there are more significant in release of new production	Only functional knowledge matters. Costs of an increment of functional knowledge provide the most part of a profit gain.
Knowledge generation strategy	more than 10%	The volume of new production reaches a maximum due to functional knowledge. <sup>1</sup>	

In a knowledge management of the industrial companies, it is important to form several strategic approaches for generation of various types of knowledge.

If the main objective of management to change in information resources (data on factors of the external environment of the company), operational knowledge must be a key resource. In this case, it is expedient to use borrowed knowledge strategy for the enterprises - that is using the bought formalized knowledge. For example, the manager of the civil aviation plant told that new products and technologies they develop, information resources buy or copy from the Internet, and various questions on optimization of personnel structure charge to consulting firms.

If the main objective of management to change in organizational and structural resources (knowledge of employees, organizational structure, and culture), the main attention needs to be paid to the generation of structural knowledge. The application of the strategy of copying and imitation is admissible in process generation of structural knowledge. For example, the manager of the chemical engineering plant has noted that it was much more favorable to order development of new structure to consulting firm (it was worth doing 7% of the general expenses of the enterprise) then to make themselves.

The main part of competitive advantage in the industry it relates to change of infrastructure resources and production of functional knowledge. Functional knowledge change technologies and processes, ways and methods of production, etc. In this case, knowledge generation strategy is optimum. The manager of the chemical engineering plant has noted that it was much more favorable to order development of new structure to consulting firm (it was worth doing 7% of the general expenses of the enterprise) then to make themselves.

Results of an empirical research have shown that dependence exists between the quantity of new products and shares of costs of generation of various types of knowledge. Authors have determined sizes of quantity of new products and cost on R&D for the knowledge increase strategy. At a minimal share of research costs, product renovation process is slow. Generation of operational knowledge allows updating the existing products according to market conditions.

If the size of costs of R&D is equal to 4-6% of the size of cumulative expenses, the release of new products increases due to increase in functional and structural knowledge (80%). The impotence of operational knowledge grows in the production of new products at costs of R&D of 4-6%. At the same time, structural knowledge plays the most important role: updating of production happens generally due to the training of personnel and organizational transformations.

For the production of a new product, it is necessary to make costs of the research equipment and materials, laboratory experiments and tests, licensing and patenting. Therefore, the share of functional knowledge considerably increases: to 50% at the size of costs of researches and development of 8% of cumulative expenses of the company.

Authors have revealed the influence of the structure of knowledge costs on profit markup. If costs of researches and developments the minimum, then all types of knowledge influence profit markup equally a little. With increase in costs of R&D, the role of functional knowledge in profitable of the company increases.

If costs of researches and developments make more than 8% importance of functional knowledge for increase in profit of the company grows, operational and structural - falls. That is very different from consumer goods manufacturers for whom market competitive advantages are higher and therefore market research and advertising costs increase expenses on operational knowledge.

## **Conclusion**

The study aimed to identify and to characterize the strategies of knowledge generation in the real sector of the Russian economy.

Firstly, authors offer the company knowledge strategic management model for activating of knowledge generation in the economy.

Secondly, authors offer the typologies of increase knowledge strategies included four types of strategies: borrowed knowledge strategy; copied knowledge strategy; knowledge imitation strategy; knowledge generation strategy.

The conducted research expands methodological tools of the knowledge economics theory. The knowledge increase strategies and their main characteristics offered by authors will be useful to the planning of innovative development of the companies.

Optimization of expenses structure for various types of knowledge is necessary for the development of the enterprises in the conditions of the knowledge economy. Authors proved that the optimum costs structure of knowledge has prime value for effective innovative development of the enterprises, especially in difficult economic conditions. Strategic management of knowledge gives the greatest effect in an achievement of competitiveness if this management relies on the basic strategy of the enterprise, and considers its purposes and the directions of growth.

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## INVENTORY MANAGEMENT USING ARTIFICIAL NEURAL NETWORKS IN A CONCRETE CASE

Marek Vochozka

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### Abstract

**Purpose:** A company creates an inventory in order to be able to continuously produce and fully meet the demand for its products. It thus covers the time and quantity discrepancy between articles of the supplier-buyer chain, and if applicable, between the different phases of production. But the very existence of inventories equals financial costs for their acquisition and maintenance, as well as economic costs stemming from the fact that the funds bound to inventories cannot be used more effectively by the company. Therefore, inventory management searches for the best volume of reserves that generates the lowest possible cost while being able to satisfy customer demand. There are currently a number of methods of inventory management (e.g. ABC), which are more or less effective. Neural networks also appear to be one of the methods of optimizing company inventory. They are useful for the prediction of time series. The aim of this article is to verify the possibility of using neural networks for inventory management using an example of a particular company.

**Design/methodology/approach:** The data file contains the time series of a particular company's inventory covering the period of the last two years. Data are fitted to a curve that deviates the least from the actual data and that can also predict the future development of the state of inventories. The differences between reality and the obtained regression curve are measured by the method of least squares. To obtain the regression curve, neural networks were used, specifically, 10000 multilayer perceptron networks were generated. The best five were selected using the least squares method. These subsequently underwent a factual test of reliability and the most appropriate curve for the given company was determined.

**Findings:** A neural structure that describes the development of company inventory very accurately was obtained, and it is therefore apparent that it also has the ability to predict the development of company inventory in the future. The acquired perceptron network was subjected to factual analysis and arguments for and against its use in practice were given.

**Research/practical implications:** On the basis of the neural structure, the business can predict not only the future state of inventory, but also its movement in time. By doing so it will be able to reflect not only the needs of production and producer demand, but also fluctuations in the supply of inventories. It will be able to determine the optimal safety inventory, and if applicable, the optimal technological inventory, and obviously also the appropriate delivery cycles of inventories. The procedure for obtaining the neural structure is also applicable to other businesses.

**Originality/value:** The additional value of the article can be seen in the use of neural structures in inventory management, and therefore in achieving a higher degree of accuracy of the obtained results.

**Keywords:** Neural network, inventory management, costs

**JEL Codes:** C45, G31

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## **Introduction**

Every manager dealing with supply management should be familiar with all the processes within the given enterprise linked to supplies and their management. According to Emmett (2008), supply management belongs among the most significant logistical activities in both production and business enterprises which demand constant attention from management's side.

### **1 Supply Management**

Also Arunraj & Ahrens (2015) view supply management as an important process that influences the company's behaviour substantially. The enterprise often binds a huge amount of its capital in supplies, which has a considerable influence on the final economic result. According to Wee, Wang, Chen et al. (2006) supply management quality matters, rooted in acquiring a strategic competitive advantage and in a considerable improvement of the enterprise's financial situation.

Adeyemi & Salami (2010) explain the main task of supply management, which lies in balancing the time and amount discrepancy between production and consumption (in production enterprises and purchase and sale (in business enterprises). Lambert, Stock & Ellram (2000) characterize the aims of supply management as an effort to increase return via a higher-quality supply management, predicting the impacts of enterprise strategies on supply situation and minimizing total costs of logistic processes during the current need satisfaction on customer service.

Horáková & Kubát (1998) see the content and aim of supply management in an efficient handling and efficient use of supplies, use of all reserves existing in this area and respecting all factors influencing the efficiency of supply management. The existence of supplies at a point when there is no use of them, i.e. there is no demand for them, means a useless spending. On the other hand, in case of supply non-existence, when their delivery is necessary, there is loss of sale, customers, and later, loss of the company's good name.

As it has already been mentioned above, supplies do have a significant influence on the enterprise's economic result as well as its competitive position in the market. The amount of supplies within the company should be optimally chosen. Because supplies bind a high amount of capital, they should be as low as possible. However, on the other hand, to ensure a sufficient supply emergency, the supplies should be as large as possible. In case supply amount is high, the elasticity towards demand fluctuations will be ensured, ut a high value of capital, which could be used by the company in other areas, will be bound in supplies (Kot, Grondys & Szopa, 2011).

## **2 Neural Networks**

Present time offers a huge amount of methods through which an enterprise may manage its supplies. One of the possibilities is supply management via neural networks, which has a number of advantages, while on the other hand also some disadvantages.

Neural networks demand (as opposed to other models) a considerable set of information to specify the network's outcome. Thus, they are unable to evaluate and predict different variables without high-quality and comprehensive example data. The model of neural networks is suitable especially due to its ability to analyse huge amounts of data (Mileris & Bogusluskas, 2011). Lu et al. (2013) see the main advantage of artificial neural networks, as opposed to computer programs using classic algorithms in the option of using several neurons at once. Another significant advantage of artificial neural networks is the ability to work with incomplete information, and an equal approach to each given task (Echávarri Otero et al., 2014). Wu et al. (2011) claim that networks have the ability to learn and subsequently they are able to point out strongly non-linear dependencies. They use distributed parallel processing of information and they reach a high-speed processing of huge amounts of data.

The significant disadvantage of artificial neural networks according to Echávarri Otero et al. (2014) lies in a time-consuming preparation of network in the form of network-learning as well as a frequently needed statistical adjustment of input data. Another disadvantage may be their easy 'overtraining' leading to very negative predictions. Due to this, it is totally key to discover the right moment of an ending to network training. According to Lahsasni, Ainon & Teh (2008, pp. 396-397) another negative point of neural networks is the fact that the learning algorithm may be caught in a local minimum, thus a global solution may never be found. Kiruthika & Dilsha (2015) claim that the process incomprehensibility and ignorance of a clear functional algorithm or prescription, which has generated the given prediction, is one of the many objections against the use of neural networks as a prediction tool.

The aim of this contribution is to analyse the option of using neural networks for supply flow optimization on a specific sample.

## **3 Data and methods**

Data from the Josef Kroužil Company will be analysed. The company deals with plumbing work. Specifically, data on motion on the item called 'AQUAMAT H 24/10, V 24/10, V 18/10, rubber bag' will be used. The product is produced by the ČKD Dukla Company and serves as

a component of pressure containers. Data on supply development is available for 2015. Data describes every motion in the warehouse as well as on every item. The statistical data description will be given in the first results part divided into individual preserved structures and divided into data sets. 114 data lines are registered in the compilation. Some moves out of these happened on the same day. The annual history is a significant fact for the contribution. Thus, we can assess possible production seasonality, and assess possible extraordinary situations.

To carry out the calculation, two software tools will be used – DELL Statistica in version No. 12 and Microsoft Excell version No. 15.32. First, we will insert all data concerning the initial balance and all the moves on individual days into a table which will have, in its final form, three columns – supply movement dates, supply movement (a negative value signifies output from warehouse, positive signifies reception at warehouse) and supply balance at the end of the day. This table will be put together in the MS Excell software. Consequently, it will be imported into the Statistica programme. Meanwhile, the first column and the first line will be left as case and variable descriptions. Consequently, neural networks will be chosen in the Data mining part. In the next selection, we will decide for time lines (specifically regression). We will even further work with Automated Neural Networks (ANNs). We will choose the aim variable. That will be the warehouse balance. The input variable quantity (which will not be chosen, however because it already describes the case), will be the date. Subsequently, all data will be divided into three sets – training one, testing one, and validation one, following this ratio: 70:15:15. The aim is to find neural structures in the training data set, and assess their value on the two data sets left – the testing one and the validation one. Time-line delay will be set at the value No. 1.

Only two types of neural networks will be searched for – Multilayer Perceptron Networks (MLP) and neural networks of Radial Basic Functions (RBF). 1000 networks will be trained. Out of them, five networks with best characteristics – performance (respectively the highest value of correlational coefficient in all three data sets) and the smallest error will be kept for further analysis. In MLP 2 to 20 neurons in the hidden layer will be considered. In RBF 15 to 21 neurons in the hidden layer will be worked with.

In case of MLP these activation functions for neurons in both hidden and output neuron layer will be used: Identity, Logistical Function, Hyperbolic tangens, Exponential Function, Sinus.

The result of the applied methodics will be neural networks, out of which the best will be chosen and their possible use for a specific enterprise's, i.e. Josef Kroužil Company supply management will be determined.

## 4 Results

The data was divided into three sets – a training one, a testing one and a validation one. Data in individual sets, although divided randomly, prove similar characteristics (in all aspects – minimal, maximal, average values as well as standard deviation). 1000 neural networks were trained. Five of them were preserved, fulfilling the parameters and errors the best (in Table No. 1).

**Tab. 1: An overview of preserved neural networks**

Index	Name of Network	Training Perf.	Testing Perf.	Validation Perf.	Training Error	Testing Error	Validation Error	Training Algorithm	Error Function	Hidden Layer Activat.	Output Activat. Function
1	RBF 1-16-1	0.940872	0.906450	0.908505	9.13635	14.46796	11.87993	RBFT	Sum of Squares	Gauss	Identity
2	RBF 1-21-1	0.951204	0.909905	0.907853	7.57006	13.89473	12.86032	RBFT	Sum of Squares	Gauss	Identity
3	RBF 1-15-1	0.932676	0.885968	0.906108	10.35011	17.69539	13.23565	RBFT	Sum of Squares.	Gauss	Identity
4	RBF 1-15-1	0.948912	0.898422	0.916266	7.92925	15.32858	10.39351	RBFT	Sum of Squares	Gauss	Identity
5	RBF 1-19-1	0.937696	0.909279	0.908278	9.66691	14.89778	13.15426	RBFT	Sum of Squares	Gauss	Identity

Source: Own.

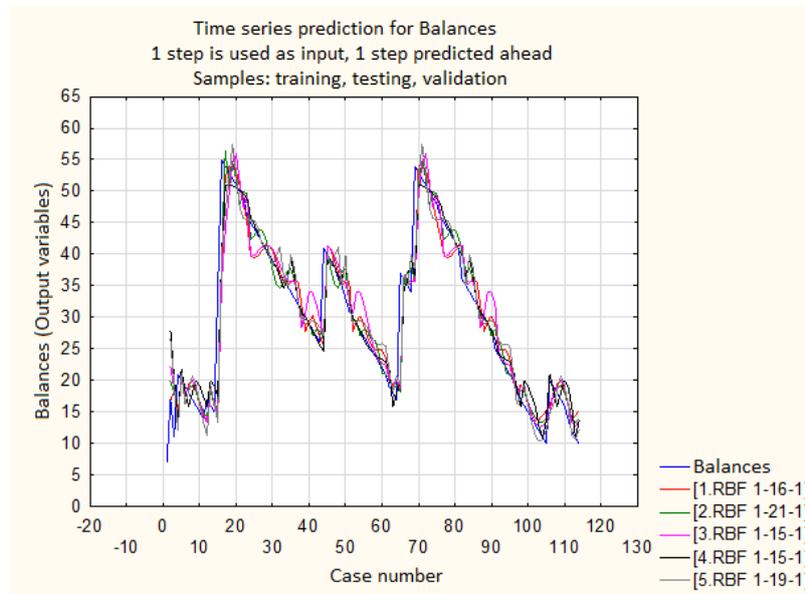
All preserved neural networks are RBF. These are networks that have one neuron in the input layer (time) and one neuron in the output layer (number of bags in the warehouse). They differ in number of neurons in the hidden layer. It is made of approximately 15 to 21 neurons. In all preserved networks Gaussian Curve was used as an activation function in the hidden layer, Identity was used in the neuron output layer.

In general, minimal error and the highest performance are considered to be the ideal combination of neural networks' characteristics, always on an approximately similar level for all three sets of data. Performance and error consistency testify more on the reliability of the generated structure rather than an extremely positive result in one item (one set of data). Performance, respectively correlational coefficients, clearly prove a high performance. In most cases, it moves around the value of 0.9. Only two results only approach the border of 0.9. In all preserved networks, the best performance is detected in the training data set, the weakest in the testing data set. The performance of testing and validation data sets is relatively mutually close. Generally, we can evaluate the fact that the preserved RBF neural networks prove promising parameters.

Comparison of warehouse balance development during the observed period with the predicted values of obtained neural networks is the object of Figure No. 1. The blue curve gives the real balance development. Other colours in the graph represent the obtained neural

structures. Optically, all five neural networks appear to be useful. Let us claim that at first sight the less RBF are networks number 1 and 3. On the contrary, in the other networks nothing can be stated positively.

**Fig. 4: Prediction of time lines for supply balance within a warehouse**



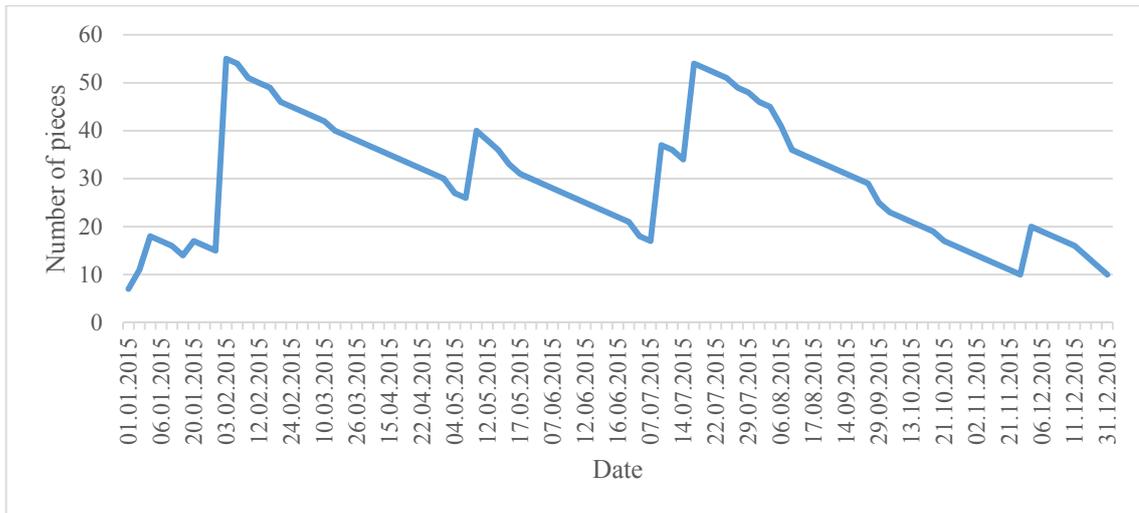
Source: Own.

More could be hinted by the residue analysis. Yes, we can deal with residue of individual cases or calculate residue dispersion. For a basic overview, however, a sum of absolute residues for the observed period of time per individual networks will be used (RBF 1-16-1: 5.50123; RBF 1-21-1: 1.25553; RBF 1-15-1: -29.23076; RBF 1-15-1: -25.79390; RBF 1-19-1: -28.56823).

In case of a residue sum-up we are looking for a result the absolute value of which will be approaching zero the most. According to this evaluation, the most successful network seems to be the second network (RBF 1-21-1) followed by Network No. 1 (RBF 1-16-1).

Let's go back to the aim of this contribution. The aim is to find such a neural structure, which will help us discover future development and need of warehouse supplies. We must emphasize that optimizing supply management is not the aim. If the enterprise manages its supplies, it strives to eliminate two types of costs that occur in relation to stockholding – financial costs related to getting a maintenance of supplies, and opportunity costs related to the fact that financial resources are bound in supplies, and these resources can not be used more efficiently. Figure No. 2 portrays the process of supply balance in warehouses per observed period, i.e. 2015.

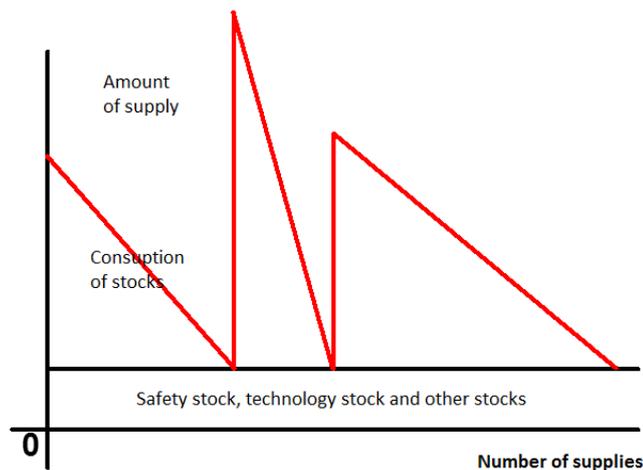
**Fig. 5: Supply Balance Development per observed Period**



Source: Own.

The graphics proves delivery cycle during an irregular order amount and an irregular consumption (let us compare with Figure No. 3.).

**Fig. 6: Delivery Cycle during Irregular Order Moment and Irregular Supply Consumption**



Source: Own.

Figure No. 3. offers a theoretical sketch of delivery cycle in case of irregular consumption and different supply order time. The real movement in Josef Kroužil Company’s warehouse approaches the theoretical concept very closely. Emergency, Technological and other supplies may be guessed in 10 pieces (without exacting them). Nevertheless, let us go back. The aim of this contribution is not to optimize supply management system but to predict

future supply residue in the warehouse. Thus, we keep working at the same efficiency rate (repectively inefficiency) with which the company has been working up to now.

The process of supply residues for the predicted period, i.e. 2016 will be interesting. If we observe supply residue at moments of supply movement per 2015, we should ideally obtain a curve responding to the curve in Figure No. 2.

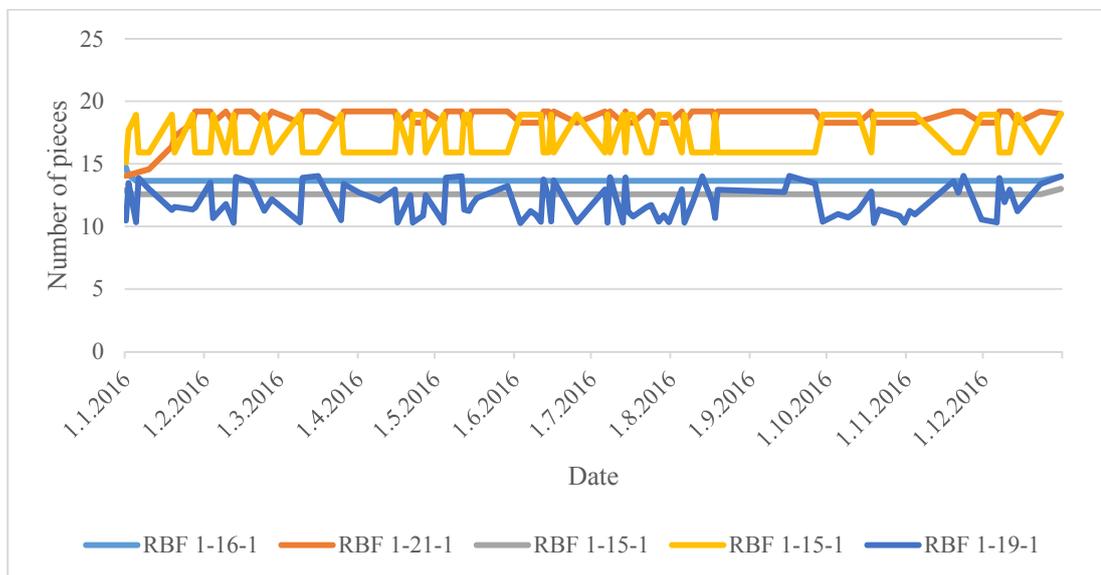
Graph in Figure No. 4 offers the process of predicted supply residues for Josef Kroužil Company in 2016.

The graphics clealy proves that not one of the obtained curves is similar to the supply residue process in 2015, although we observe them at the same moment (at the moment of their predicted consumption).

There may be several reasons. In the first place, a low-quality set of input data may be available. The truth is that supplies were moving irregularly during the year (timewise as well as factwise).

In In the second place, it may be too long a period the prediction is implemented in. We may not be mistaken in the short-term period. Unfortunately, we make the big mistake in a long-term period.

**Fig. 7: Process of Predicted residues in 2016**



Source: Own.

In the third place, despite a high level of correlation there is a series of other influences, which have not been included within the model as axioms of its origin.

In the fourth place, the result is correct and such a development can be predicted. In fact, during a certain period all networks offer a constant development.

We tend to agree with option No. 3. i.e. the model should have been limited even further – for example product or service demand, minimal order supply amount, costs on getting supplies, costs on stockholding, emergency supply, technological supply (rather not in this case) etc.

## **Conclusion**

The aim of this contribution was to analyse the option of neural network use for supply flow optimization, giving a specific example.

Josef Kroužil Company's data for 2015 was used as a case study. Data analysis was carried out and 1000 neural networks were generated. Five of them proving the best parameters – performance and error - were preserved. Consequently, absolute residue analysis and factual analysis of obtained neural networks were carried out. We can claim that probably the most suitable structure is network number two, RBF 1-21-1. It proves a high performance, low error and minimal residue. Nevertheless, in predicting for 2016 it differs from warehouse supply process in the predicted period (on the same days) of 2015. A number of reasons may be guessed. The most probable seems to be omitting several input data which has probably the least same meaning as time – minimal order supply amount, costs on getting the supplies, costs on stockholding, costs of emergency supply, and so on. That means that we have optically met the aim but the result value is not so optimal although we realise the fact that every model simplifies reality. That is why I will allow myself to draw the following conclusion: 'Time line analysis and prediction of future supply development based on this analysis is not a suitable tool to guess the future warehouse supply residues. A more suitable tool is probably regression using neural networks when including other significant factors, such as product demand, minimal order amount, costs on supply maintenance, etc.'

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**MODELING THE FUTURE DEVELOPMENT OF TOP COMPANY  
INDICATOR EVA EQUITY USING INDICATOR BREAKDOWN  
AND SENSITIVITY ANALYSIS ON AN EXAMPLE OF A SPECIFIC  
COMPANY**

**Jaromír Vrbka**

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**Abstract**

**Purpose:** Economic value added focused on equity (i.e. EVA Equity) measures the rate of the evaluation of equity while respecting risk. EVA Equity also reflects the degree of value creation for shareholders. EVA can be used to calculate the value of a company. The indicator is thus designed to have its specific planned value become the main target of the company. This paper aims to break down EVA Equity and to subsequently determine the way individual variables making up the indicator are managed.

**Design/methodology/approach:** The data set contains the financial statements of Budvar, n. p. company. It is an enterprise, which deals with beer production. The analyzed period is from year 2011 to 2015. Further on, external data of the Czech National Bank are used. The set of variables influencing the creation of EVA Equity is determined by the breakdown of EVA Equity. Using sensitivity analysis, the significance of individual variables is defined and the range of significance of individual variables for the company and its management is determined accordingly.

**Findings:** The breakdown of a top indicator -EVA Equity- was conducted. Next, the individual variables involved in the calculation of EVA Equity were identified, which can immediately affect the company and its management. According to methodology and based on the obtained results, a sensitivity analysis was performed and it was determined which variables are more valuable for the company and which have less importance.

**Research/practical implications:** The practical outcome are quantities that the company, in order to be successful, needs to monitor, plan, manage and control the execution of. These variables are reflected in the tactical and operational plans of the company and every manager knows which way to influence them and, conversely, which ways they influence the success or failure of a business.

**Originality/value:** The value of the paper can be seen in the application of EVA into everyday plans of the company through variables that shape the EVA Equity indicator.

**Keywords:** EVA Equity, breakdown of indicator, management

**JEL Codes:** C32, C52, G32

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## Introduction

Lately, many more experts express the opinion that the main goal of a stable enterprise is especially the value growth for owners, shareholders. There are a few suitable options of how to measure such a growth. Indisputably, the EVA (Economic Value Added) indicator belongs among them (Stehel and Vochozka, 2016).

The EVA is a useful and a very significant tool in evaluating the enterprise's efficiency. It combines such factors as economy, bookkeeping and information about the market. The EVA indicator tries to express the real economic income of an enterprise (Issham et al., 2008).

Its significant advantage as opposed to usual approaches lies in a comprehensible evaluation of economic efficiency of an enterprise and consideration of the range of investment risk necessary to reach this efficiency (Stehel and Vochozka, 2016). Kollar and Kliestik (2014) claim that EVA represents the most advanced tool of efficiency measuring in an enterprise based on the principle of value management. The reason for this is a relatively easy approach, compared to other evaluating criteria. The disadvantage of EVA indicator is the fact that it demands relatively vast adjustments of bookkeeping data and is affected by the size of enterprises, as it is ranked among absolute indicators.

The aim of this contribution is to measure the EVA equity in a specific enterprise, identify the indicators which may be efficiently influenced by the enterprise, and based on the sensitivity analysis determine with what degree of importance the enterprise should pay attention to the specific indicator (variable).

## 1 EVA Indicator

According to Bluszcz and Kijewska (2016), the EVA indicator relies on the amount of invested capital (IC) and economic spread (ED). Frank and Shen (2016) claim that economic spread is expressed through weighted average cost of capital (WACC) and the return on invested capital (ROIC). The EVA indicator may thus be detected from the following formula:

$$\text{EVA} = \text{NOPAT} - \text{WACC} * \text{C} \quad (1)$$

where the following means: NOPAT – operating profit, C – Total long-term invested Capital, WACC – Weighted Average Cost of Capital.

According to Salaga et al. (2015), the EVA indicator may be divided into individual partial indicators according to the INFA model, which was created by the Neumaiers. The INFA model follows the formula of EVA Equity indicator. That is supposed to be a structure

discovering the fact that the value of economic income depends on the value of equity (E), on the rentability of equity (ROE) and its costs (re):

$$EVA = (ROE - r_e) * E \quad (2)$$

where: ROE – return on equity,  $r_e$  – cost of equity, E – equity.

According to Ichsani and Suhardi (2015), we can express return on equity as follows:

$$ROE = EAT / Equity \quad (3)$$

where: EAT – earnings after tax.

Cost of Equity (re) in % can be expressed in the following formula (Dzurickova, Fabinyova and Mihalcova, 2015):

$$re = r_f + \beta * (r_m - r_f) \quad (4)$$

where:  $r_f$  – risk-free interest rate,  $\beta$  – the coefficient of relative risk,  $r_m$  – average rate of return in capital market.

## 2 Sensitivity analysis

If the input data for the organization's efficiency evaluation cannot be strictly given, sensitivity analysis may be used. That detects how much the analysed project is sensitive towards the change of many factors, which may be affecting it in a certain way. Enterprise evaluation is one of the most significant financial decision-making processes within enterprise management. Input data sensitivity is thus significant for financial decision-making, and that is the reason why sensitivity analysis is one of the tools used for solving this problem (Dluhosova et al., 2010).

To model the future development of an enterprise sensitivity analysis is usually used. Activity in this area keeps growing and with regard to a growing complexity of numeric models, sensitivity analysis plays a key role in testing of correctness (Borgonovo and Peccati, 2004). Sensitivity analysis allows the creation of favourable conditions for decision-making according to the given facts, and resulting values are easily presentable for the management. The purpose of this analysis is to illustrate a wide spectre of aims for which sensitivity analysis may be used, and thus stimulate its efficient use in modelling. The disadvantage of this analysis is that its stimulation options are limited (Pianosi et al., 2016).

According to Tarantol a Saltelli (2003), sensitivity analysis is more frequently being used to develop, to understand difficult phenomena, to improve the current enterprise situation, etc. Key role in this analysis is taken by the identification of problems, improving models

through decreasing or simplification of processes, support of development modelling and model evaluation (Confalonieri et al., 2012).

### 3 Data and Methodology

To fulfill the aim of this contribution, it is necessary to identify specific input information for the calculation. As a model example, we can use Budvar, n. p. It is an enterprise, which deals with beer production. Rules of its economy are given by an individual law. For it is an enterprise which, from the legal perspective, is the only one of its kind in the Czech Republic. To carry out the EVA Equity calculation, the data out of National Enterprise Financial Statements. Further on, we will be using external data of the Czech National Bank having a risk-free value, income-tax rate.

Let's now turn our attention towards the calculation of the EVA using the modular method (Ministry of Industry and Trade, 2012):

- Economic Value Added:

$$EVA = (ROE - r_e) * E \quad (5)$$

where: ROE – return on equity.

- Weighted Average Costs on Capital :

$$WACC = r_f + r_{LA} + r_{\text{entrepreneur}} + r_{\text{FinStab}} \quad (6)$$

where:  $r_f$  (risk free) – means a risk-free rate,  $r_{LA}$  – function of indicators characterizing the size of the given enterprise,  $r_{\text{entrepreneur}}$  – indicator function characterizing the creation of production force,  $r_{\text{FinStab}}$  – indicator function characterizing the relations between assets and liabilities.

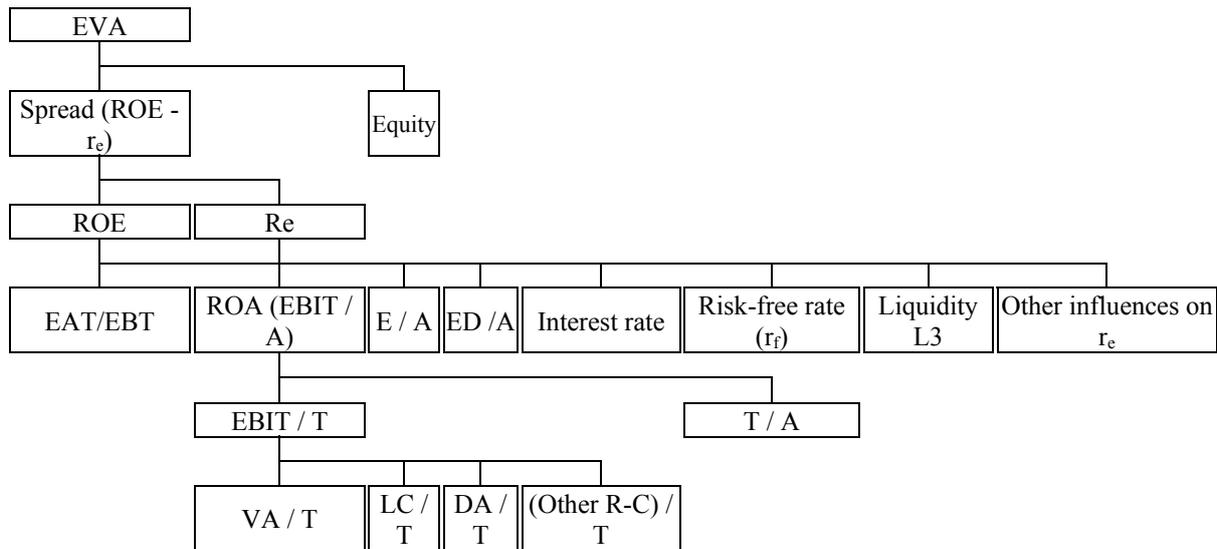
- Alternative costs on Equity

$$r_e = \frac{WACC * \frac{C}{A} - (1-t) * r_d * \left(\frac{C * E}{A * A}\right)}{\frac{E}{A}} \quad (7)$$

where: A (Assets) – total assets (balance sheet total).

Disintegration of the top EVA indicator compiled through the modular method is the subject of Graphics No. 1.

**Fig. No. 1: Disintegration of EVA Indicator**



Source: MPO (2012)

Indicator, which, having affected the equity also affects the EVA development is called „spread“ and is accounted as the difference of equity return and alternative costs on equity. Return on Equity (ROE) is by standard determined as a proportion of earnings after tax (EAT) and equity. If we break away from the EVA as the top indicator, ROE also serves to calculate the rate of equity evaluation put into the enterprise and a subsequent comparison to other investment options (meant from the enterprise owner’s perspective). The EVA advantage is evaluating investment options on a different level of risk, which is not allowed by the ROE. Level of risk is implanted into the model through alternative costs of equity, respectively in case of modular method through the calculation of weighted average costs on capital. Costs on Equity are labeled in the model as alternative because they are based on the classification of level of risk, not from the real dividend or shares paid off to the enterprise owners.

ROE or  $r_e$  are not indicators that would be managed straightaway. Their calculation is given by several other indicators:

EAT/EBT (a share of earning after tax and earning before tax), ROA (a share of equity before interest and tax and the enterprise assets – EBIT/A), EBIT/T – Turnover (equity before interest and tax and turnover made from corporate activity), VA/T – Value Added (a share of value added and enterprise turnover), LC/T – Labour Cost (a share of personal costs and turnover, personal costs are made up of these items: wage costs, rewards given to the enterprise organ and body members, social insurance costs and health insurance costs, social costs), DA/T – Depreciation and Amortization (a share of depreciation – and amortization – and enterprise

turnover), Other (R-C)/T – Revenues and Costs (a share of the difference of revenues left until now left out of the calculation and enterprise turnover), T/A – asset turnover (a share of turnover and enterprise assets), E/A – Equity: Equity Ratio (a share of equity on financing enterprise assets), ED/A – Equity Debt (how much enterprise assets are financed through capital obtained for remuneration), Interest Rate (is the result of dealings between the enterprise and a bank in case of long-term and short-term interests), Risk-free rate (a yield obtained by the investor for almost 100% certainty in case of a specific investment), L3 Liquidity = Current Assets/(Short-term liabilities + short-term bank credits), Other influences: they are more or less a static deviation when determining the top indicator, and they should not overreach 5% of the total result.

Subsequently, we will choose indicators, which may be affected by the management, having carried out sensitivity analysis we will recommend the enterprise which indicator should be given maximal attention.

## 4 Results

The EVA Equity results for the national Budvar enterprise per 2011-2015 are given in Table No. 1.

**Tab. No. 1 EVA Equity Calculation for Budvar, n.p. for 2011-2015**

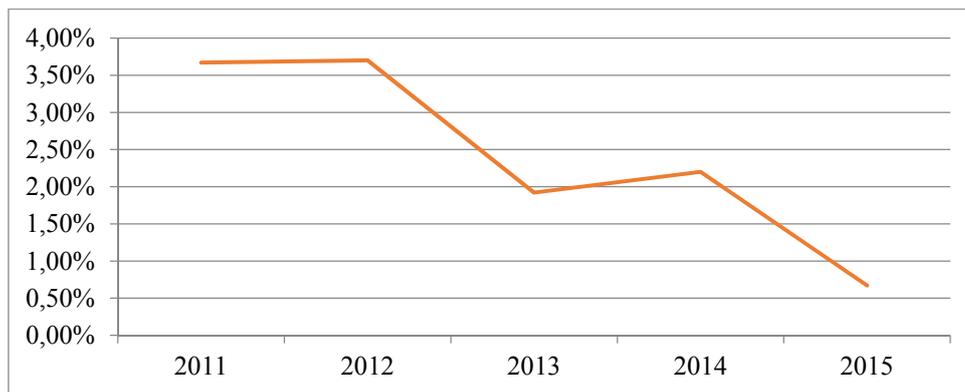
Label	Description	2011	2012	2013	2014	2015
$r_f$	Risk-free yield	3,67%	3,70%	1,92%	2,20%	0,67%
$r_{LA}$	Indicators giving size of enterprise	0,00%	0,00%	0,00%	0,00%	0,00%
$R_{\text{entrepreneur}}$	Indicators giving production force	0,00%	0,00%	0,00%	0,00%	0,00%
	XP	0,000	0,000	0,000	0,000	0,000
$ROA$	EBIT/Assets	0,045	0,041	0,059	0,062	0,073
$r_{\text{FinStab}}$	Indicators giving relations between assets and liabilities	0,00%	0,00%	0,00%	0,00%	0,00%
	Total Liquidity	6,98	7,87	9,29	8,28	7,46
	Common Liquidity	6,33	7,21	8,55	7,45	6,64
<b>WACC</b>	<b>Weighted Average Costs on Capital</b>	<b>3,67%</b>	<b>3,70%</b>	<b>1,92%</b>	<b>2,20%</b>	<b>0,67%</b>
$ROE$	Return on Equity	4,13%	3,70%	5,84%	5,51%	6,64%
$r_e$	Alternative Costs on Equity	3,67%	3,70%	1,92%	2,20%	0,67%
$UZ$	Remuneration sources (Equity+bank credit+bonds issued)	4 606 988	4 774 72	5 020 62	4 461 92	4 239 14
$D$	Legal Entity Income Tax Rate	19%	19%	19%	19%	19%
<b>EVA</b>	<b>EVA Equity</b>	<b>21 223</b>	<b>-138</b>	<b>196 735</b>	<b>147 682</b>	<b>253 067</b>

Note: Values given in Table expressing money value are given in thousands CZK.

Source: Own

The table proves partial results leading to the EVA Equity calculation. At first sight it is clear that the enterprise uses only equity to finance own activities. Thanks to that, weighted average costs on capital and alternative costs on equity are identical during the period observed. The progress of alternative costs on equity is the focus of Graphics No. 2.

**Fig. No. 2: Progress of alternative costs on Equity per 2011-2015**

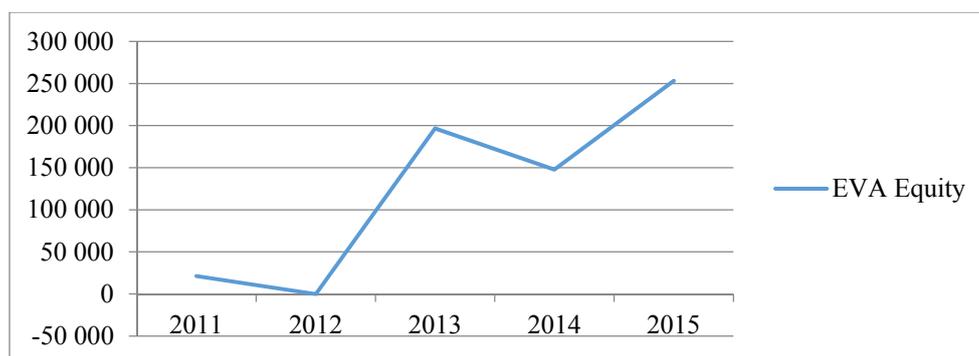


Source: Own

Specific EVA Equity values are portrayed in Graph No. 3. The shape of the curve proves the costs on equity influence on the EVA Equity.

We may claim that it is inversed. Costs on equity during the observed period kept decreasing from 3.67% to 0.67%. Profitability, on the contrary, changed less in time, it increased from 4.13% to 6.64%. Of course, ROE also contributed to the value.

**Fig. No. 3: EVA Equity per 2011-2015**



Source: Own

EVA Equity has increased from CZK 21 million to 253 million. That may be considered a very positive trend and a real success of the enterprise.

From the analysis of EVA disintegration the resulting information is that the enterprise should manage these absolute indicators to reach a positive result: Capital Structure (ratio of equity and foreign capital), Profit (difference between revenues and costs), Short-term liabilities (especially short-term liabilities from business contacts), Short-term bank credits, Assets (as a whole), Reserves, Receivables, Short-term financial property, Business Margin (the difference in revenues for goods sold and costs for goods sold), Performance (revenues for sale of own products and services, change in the status of internal reserves and activation), Performance Consumption (consumption of materials and energy, services), Labour Costs, Rewards given to the enterprise organ and body members, Social Costs, Depreciation, Interest Rate.

We are discussing quite a huge number of variables, which may be influenced by the enterprise management. That is why I will dare to decrease their number in including foreign capital and equity and generated profit (which is a result of a range of above-mentioned indicators).

2015 will be the starting year. We will fix all values except those that are going to be tested towards this year.

First, we will deal with including foreign capital. But, the question arises what credit interest rate will be chosen. In December 2015, the average interest rate of non-financial enterprises was 2.5% (CNB, 2016). We will be working with the fact that Budvar Brewery is a national enterprise and thus its solvency is guaranteed by the Czech Republic – thus it is almost 100% certain. Further, we will assume that the enterprise works only with property needed for operation, thus its balance sum will not change. Results of sensitivity analysis, which compares the influence of a growing debt of the enterprise, are the focus of Table No. 2.

**Tab. No. 2: Sensitivity Analysis of EVA Equity on the enterprise's debt rate**

Label	Description	2015	2015 (10% debt rate)	2015 (20% debt rate)	2015 (30% debt rate)	2015 (40% debt rate)
$r_f$	Risk-free yield	0,67%	0,67%	0,67%	0,67%	0,67%
$r_{LA}$	Indicators proving the size of enterprise	0,00%	0,00%	0,00%	0,00%	0,00%
$R_{\text{entrepreneur}}$	Indicators proving production power	0,00%	0,00%	0,00%	0,00%	0,00%
	XP	0,000	0,022	0,022	0,022	0,022
$ROA$	EBIT/Assets	0,073	0,071	0,069	0,067	0,064
$r_{\text{FinStab}}$	Indicators proving relationships between assets and liabilities	0,00%	0,00%	0,00%	0,00%	0,00%
	Total Liquidity	7,46	7,46	7,46	7,46	7,46
	Common Liquidity	6,64	6,64	6,64	6,64	6,64
<b>WACC</b>	<b>Weighted Average Costs on Capital (NN)</b>	<b>0,67%</b>	<b>0,67%</b>	<b>0,67%</b>	<b>0,67%</b>	<b>0,67%</b>
$ROE$	Return on Equity	6,64%	7,38%	8,30%	9,49%	11,07%
$r_e$	Alternative Costs on Equity Alternativní (NN)	0,67%	0,52%	0,33%	0,09%	-0,23%
$UZ$	Remuneration Sources (Equity + bank credits + bonds issued)	4 239 174	4 239 174	4 239 174	4 239 174	4 239 174
$d$	Legal Entity Income Tax Rate	19%	19%	19%	19%	19%
<b>EVA</b>	<b>EVA Equity</b>	<b>253 067</b>	<b>261 651</b>	<b>270 235</b>	<b>278 820</b>	<b>287 404</b>

Source: Own

The table proves clearly that under otherwise unchanged conditions the increase in foreign capital means financing the enterprise in 1% (assuming that the total balance sum will not change) EVA Equity growth in more than CZK 858 thousand. What does that mean? For the owner, the effect is purely positive in case that they have an option to invest their means sufficiently, but somewhere else. Increasing the share of foreign capital in an unchanged need of operation-necessary property, the return on equity will increase. Financial lever will start working. Thus, the volume of generated EVA Equity will increase and the enterprise will have a higher value for its owner because at an unchanged profit rate the owner may release a part of his input capital, and use it somewhere else and reach a higher absolute profit coming from capital investments.

The results of sensitivity analysis, thanks to which we compared the impact of profit increase on EVA Equity, are given in Table No. 3.

**Tab. No. 3: Sensitivity Analysis of EVA Equity on Profit Rate**

Label	Description	2015	2015 (10% profit)	2015 (20% profit)	2015 (30% profit)	2015 (40% profit)
$r_f$	Risk-free yield	0,67%	0,67%	0,67%	0,67%	0,67%
$r_{LA}$	Indicators proving the size of enterprise	0,00%	0,00%	0,00%	0,00%	0,00%
$R_{\text{entrepreneur}}$	Indicators proving production power	0,00%	0,00%	0,00%	0,00%	0,00%
	XP	0,000	0,000	0,000	0,000	0,000
$ROA$	EBIT/Assets	0,073	0,079	0,085	0,091	0,097
$r_{\text{FinStab}}$	Indicators proving relationships between assets and liabilities	0,00%	0,00%	0,00%	0,00%	0,00%
	Total Liquidity	7,46	7,46	7,46	7,46	7,46
	Common Liquidity	6,64	6,64	6,64	6,64	6,64
<b>WACC</b>	<b>Weighted Average Costs on Capital (NN)</b>	<b>0,67%</b>	<b>0,67%</b>	<b>0,67%</b>	<b>0,67%</b>	<b>0,67%</b>
$ROE$	Return on Equity	6,64%	7,30%	7,86%	8,46%	9,06%
$r_e$	Alternative Costs on Equity Alternativní (NN)	0,67%	0,67%	0,67%	0,67%	0,67%
$UZ$	Remuneration Sources (Equity + bank credits+ bonds issued)	4 239 174	4 239 174	4 295 468	4 323 615	4 351 762
$d$	Legal Entity Income Tax Rate	19%	19%	19%	19%	19%
<b>EVA</b>	<b>EVA Equity</b>	<b>253 067</b>	<b>281 213</b>	<b>308 983</b>	<b>336 941</b>	<b>364 900</b>

Source: Own

The table proves that every increase in profit in 1%, i.e. more than CZK 2.8 mil., will bring the enterprise almost CZK 2.8 million in the indicator of EVA Equity. The truth is that the profit is relatively a complex indicator. We manage it through a range of other variables – costs and yields. It is of course important to take into account only operating costs and operating yields (profits ideally).

The given information proves that if the enterprise wants to reach a higher EVA Equity rate it should focus on both its capital structure as well as on implementing the profit. Although the profit percentage brings a higher effect in the form of EVA Equity growth, it is easier for the enterprise management to include foreign capital (at this point, however, necessary to mention the rules of the given enterprise economy and the higher interest, i.e. state interest to release possible foreign capital into the enterprise). On the other hand, the profit will bring a greater effect in the form of EVA Equity growth, thus the management should focus on the individual originators.

## Conclusion

The aim of this contribution was to measure EVA Equity in a specific enterprise, to identify the indicators which the enterprise may efficiently affect and based on the sensitivity analysis determine with what priority the enterprise should focus on the given indicator (variable).

Results prove that the aim of the contribution was fulfilled. EVA Equity was calculated for the following enterprise: Budvar n.p. per 2011-2015. Subsequently, indicators, which may be managed from the enterprise's and its management's perspective have been determined. Finally, sensitivity analysis was carried out, emphasising the influence of two variables on the resulting EVA Equity. Based on the results, the Budvar Enterprise may be recommended to:

- Specifically focus its attention on the EVA Equity indicator, which might be the top (strategic) enterprise goal.
- Use foreign capital when financing the enterprise. Financial lever will work. Thus, the return on equity will increase, and EVA Equity will finally do so too. Thus, the shareholder value will increase.
- Give huge attention to variables participating in profit creation – especially to operating costs and yields.

The paper outlined the application of an indicator (that plays a big role in the company and its correct interpretation can influence the company's performance) on a concrete enterprise. EVA equity can be used to the same extent and prediction for other similar enterprises.

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## „THE KEY IS WE“ – REFINING CO-CREATION INDICATORS TO ASSESS INNOVATION PROCESSES

Christina Weber – Klaus Sailer

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### Abstract

**Purpose:** Our research purpose is to test and improve an indicator instrument for real-time assessment of collaborative and dynamic innovation processes. The paper presents an indicator tool derived from successful long-term collaborative innovation across organisational and international borders, and reports initial tests to validate five performance indicators for flexible innovation teams in short term collaboration. The aim is to test and develop a tool of five indicators as dynamic network patterns that enables to discern successful from underperforming co-creation processes, at early stages.

**Design/methodology/approach:** Detection and description of the patterns indicators in various data on innovation processes - from expert interviews to focus groups, and from print media, videos and online communication by startups - need further specification. In a small focus group exercise with 20 different experts collaborating in temporary, flexible innovation teams, the five dynamic network patterns were (a) tested for the short term collaboration context, and (b) related to new attributes and statements.

**Findings:** The focus group exercise helped to validate and refine the specification of the five dynamic network patterns as indicators of successful co-creation processes. The findings (a) confirm the validity of the indicators for agile innovation teams, (b) increase evidence of some of the indicators especially for short term collaboration, (c) serve as pre-test for wide-ranging studies that improve the indicators further for start-ups, at incubators and accelerators.

**Research/practical implications:** The refined indicator instrument aims at real-time assessment of start-ups in incubators, and co-creation in any settings, based on the indication of emerging DINs in successful collaborative innovation processes. The method has a high relevance for further evaluation research on dynamic innovation processes and collaborative entrepreneurship. Its practical implication is an assessment blueprint (and training instrument) for innovation teams in co-creation processes.

**Originality/value:** This paper refines a new research instrument of high relevance and value for collaborative innovation processes in and across societal sectors.

**Keywords:** start-up evaluation, dynamic networks, collaborative entrepreneurship

**JEL Codes:** M13, C35, C93

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## Introduction

In recent times, there is an increase of international activities that foster economic growth and sustainability by creation and support of *innovation regions* and *innovation ecosystems* (Graf, 2006; Vermeulen, 2017). Therefore, the question of measuring the impact of supportive activities, teams and investments receives rising attention.

Even more, as existing indicators for innovation management and R&D investments by private and public actors are of limited reach. Looking into commonly accepted innovation radars<sup>54</sup>, the indicators used to assess the innovative capacity of a certain economic sector and region are, for example, planned and realized investments in R&D, number of realized product and service innovations, number of patent applications, or number of companies with process innovations that lead to cost savings. The measurement of innovation activity is done ex-post (called “end-of-pipe” evaluation, by output indicators), or, for many of the cases, on companies’ planned, achieved or failed R&D investments.

While such indicators - target figures, and output measures as well - solidly inform about the intensity of innovation activities in a specific economic sector and region, they are of limited to no value for assessing (a) the impact of actions taken and investments placed and (b) the collaborative innovation capacity in an innovation ecosystem. For this, assessments should be based on collaborative performance and process indicators (Stark, Vossebrecher, Dell, & Schmidhuber, 2017). Recent research interest therefore has been focussed on developing “in-the-pipe” collaborative evaluation tools, and on deducing performance indicators for successful entrepreneurship, that means, for dynamic co-creation processes with uncertain, innovative outcomes (C. R. M. Weber, Sailer, Holzmann, & Katzy, 2014). This paper takes a deeper look at so-called “real-time” and network performance indicators for co-creation in DINs - dynamic innovation networks (DINs).

For individual enterprises management, economic literature provides well described performance assessment methods. For example, the ‘balanced scorecard’, introduced by Kaplan and Norton and further adapted since 1992 (Park et al., 2017): these methods employ a set of performance indicators which are usually aligned with vision and strategy of an investigated enterprise. The strength of *innovation regions* however is less related to individual corporate performance, but to the development of clusters and networks. And despite rising recognition of collaboration as base of successful innovation processes in literature and practice, there is

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<sup>54</sup> <https://www.bmbf.de/de/deutschlands-innovationskraft-waechst-3782.html>

“still a lack of adequate performance indicators to measure collaborative innovation and entrepreneurship” (Graca & Camarinha-Matos, 2017:238).

The endeavour of recent research to close this gap inspired a thesis research on successful innovation processes in the dynamic and highly disruptive fields of global disaster management. The study resulted in a real-time foresight method and a new assessment tool that enables to identify the emergence of dynamic innovation networks (C. R. M. Weber, 2016). The tool is based on five dynamic network patterns (Alexander et al., 2000; Buschmann, Henney, & Schimdt, 2007) derived from successful long term innovation collaboration. The five success patterns were obtained by mapping critical incidents (using CIT) that changed the planned course of action and the interaction dynamics between the compared networks and involved network-actors (ANT) around these CIs.

The obtained five shared patterns of successful co-creation are useful standards for leadership, namely in two managerial directions: first, to prepare organisations for a networked co-creation process and collaborative governance without central command; and second, the patterns also offer indicators to measure collaborative innovation processes “in-the-pipe”, while a DIN is emerging in real-time. Further refinement of the robust initial indicator tool is necessary to gain a specific, adaptive and viable instrument to identify innovative co-creation processes also in start-up teams and flexible business incubation. Improving the new instrument includes testing the patterns first in various collaborative settings and contexts.

The identification of smart indicators not only for successful multisectoral or global – local innovation networks, but also for smaller teams in flexible mass collaboration settings would help public and private leadership to early select successful, sustainable innovation activities deserving all support from less favourable innovation activities. This distinction made at an early stage would save a lot of investments in time and money in practice. The research interest behind though is to advance from individual, static indicators to collaborative performance indicators for dynamic and always uncertain innovation processes.

This paper proceeds as follows: It briefly reflects on the use of indicators in general before it presents the above bespoke indicator instrument itself. Then, we report an initial validation in a focus group discussion, and describe how the different obtained expert statements help to specify the five indicators for application in flexible innovation teams.

## 1 Assessing co-creation processes by dynamic network indicators

An indicator is a “specific characteristic that informs about a settled, rarely or not observable matter of fact” (Meyer, 2004:7). Due to its content (qualitative or quantitative), it allows to compare abstract and complex phenomena using critical/numerical threshold levels, in comparison to former measures (developmental perspective) or to different units of investigation (benchmark perspective). Indicators assess strengths and weaknesses of a given process, a phenomenon or a unit of investigation and so enable managerial levels to change and adapt operations. Table 1 resumes different indicators discerning input, output, outcome and impact (performance) indicators. Most of them measure plans and results, only the last group (impact indicators) fit a process perspective.

**Table 4 – Indicator classifications (Meyer, 2004)**

	<b>Plan</b>	<b>Result</b>	<b>Process</b>
Input indicators	X		-
Output indicators		X (implementation)	-
Outcome indicators		X (not intended consequences)	-
Impact (performance) indicators		X (change and sustainability)	

Only impact or performance indicators allow for ‘real’ process instead of plan evaluation. For collaborative (instead of individual) and non-linear (instead of KPI conform) activities as dynamic innovation processes, the literature does not yet provide established methods and indicators to measure and identify successful activity (DeLOG, 2014; Gupta, MacMillan, & Surie, 2004). An initial effort, thus, was to develop a dynamic innovation network (DIN) indicator tool (C. Weber, Sailer, & Katzy, 2015). It consists of five dynamic network patterns and relies on the assumption that innovation networks emerge according to central patterns of interaction; and that specific network dynamics are an underlying structure of any successful co-creation processes (see table 2).

The indicator tool developed allows identifying the success patterns and the performance of a collaborative innovation process. Its five dynamic network principles, depicted in the left column of table 2, are (1) early identification of relevant heterogeneous actors and interests, (2) initial creation of a shared vision, (3) creation and use of boundary objects, (4) tolerance of punctual directedness and distance in network communication and (5) the double-sided focal role of the local (implementing) actor. For application in real-time evaluation, the network patterns indicators need to be carefully adapted to a specific co-creation

system (heterogeneous actors), its relevant activities (virtual, physical structures) and time frame. Here, to obtain refined indicators for investigating primary data (interview) and secondary data (media observation) a startup incubation context is chosen.

**Table 5 - Indicator tool for DIN emergence in successful co-creation processes**

	DIN pattern	Indicator catalogue for evaluating co-creation processes
1	Early identification of heterogeneous actors, alignment of interests	<p>1 Percentage of the people who eventually lead the start-up who have been engaged from the beginning/ before a central investment/ before any significant CI.</p> <p>2 On which socio-technical infrastructure does production /do services depend?</p>
2	Collaborative governance by an early found shared vision	<p>1 What does the start-up stand for? What is the most important thing that this start-up is able to deliver?</p> <p>2 Percentage of identical answers in the start-up team.</p> <p>3 Online or document analyses in search of the shared vision.</p>
3	Mindful use of boundary objects	<p>1 Percentage of people who know the logo/have built a product/ has sold a service of the start-up.</p> <p>2 Percentage of people in a founder team/ supplier group that relate the brand/ a specific wording/ a boundary object to the start-up.</p> <p>3 Which objects represent best the aims/the USP/the goals of the start-up?</p> <p>4 Objects that iterate in administrative data/ PR and marketing documents/ technical infrastructure.</p>
4	Punctual directedness and distance amongst implementing actors	<p>1 Balance to be measured and weighted in contacts between founders and staff, founders and established companies, founders and consumers (calculate the weighted average - on <i>duration/ content/ kind of contact or communicative frequency</i> - one direction is +, the other - and a zero sum would be perfect).</p>
5	Local integration of and network orientation on a local actor	<p>1 How many local/foreign founders does the start-up have?</p> <p>2 Percentage of customers that is local.</p> <p>3 Percentage of investors/resources a start-up uses that are local (<i>Quantitative sum weighted for how far away local ones are</i>)</p> <p>4 Agreement and disagreement of partners over bargains, and media visibility, and in meetings.</p>

## 2 Focus group exploration

A research exercise was set up to test the five indicator patterns for flexible innovation teams in short term collaboration. It was implemented as ad-hoc focus group discussion (Di Francescomarino et al., 2017) with 20 experts. The experts were selected male and female members of start-up teams, executives working in flexible innovation teams, and coaches of change management projects in the German creative industry. A 1h discussion was conducted in 2 groups, placed in the middle of a half day innovation and team building workshop. Two trigger questions (TQ 1 and 2) were placed as stimulus. Notes were taken on a flipchart in real-time to mirror text to experts and to let them correct given statements. Later, these statements were ranked by the researcher alone. Less frequent accounts were split from high frequency statements to exclude the purely individual statements. The remaining content was then compared to the five DIN patterns. The aim was to validate the five indicator dimensions in the different innovation context of short term, temporary, flexible innovation teams, and to obtain further positive and negative specifications. The following table 3 and table 4 resume the filtered accounts as quotes on failed (Table 3) and successful (Table 4) innovation collaboration in various short-term projects.

*TQ 1:* “On this very day, the collaboration failed and was not successful due to...”

**Table 6 – Findings of negative specification**

	Quotes	Hits	DIN indicator addressed
1	“omnipresent internet was distractive”	2	2
2	“expectations did not fit”	3	1,3
3	“listening to others did not occur”	3	4
4	“dissents block decisions”	2	5
5	“too much talking”	3	4
6	“not enough talking”	4	4
7	“support of the boss lacking in the process”	4	1
8	“support lacks in time and financial aspects”	2	-
9	“goal and interest conflicts prevail”	6	2

*TQ 2:* “On this very day, the complex collaboration was extremely successful, due to...”

**Table 7 - Findings of positive specification**

	Quotes	Hits	DIN indicator addressed
1	“structure was good”	2	-
2	“roles were clear”	2	5
3	“brainstorming was done”	5	1
4	“same values existed in the network”	12	2
5	“processes had been tested and were familiar”	3	-
6	“respect was mutual”	15	4
7	“process changed in intensity over the collaboration (increase, decrease)”	7	4
8	“clear competencies did exist”	8	1
9	“visualisation was done”	15	3
10	“tools were used”	6	1
11	“trust”	5	2,4
12	“support and resources”	7	1
13	“shared goals”	11	2
14	“questions occurring in the process could be asked and were addressed”	6	4,3

The collected data, consisting in 23 context loaded quotes, strongly relate to the five network patterns in negative as in positive ways, and strongly validate them as performance indicators for co-creation in flexible innovation teams, too. Only three of the quotes could not be subsumed to one of the five DIN patterns that form the indicator tool. These quotes address resource availability (table 3, 8), established infrastructures, and routines (table 4, 5 and 1), dimensions which are not strongly and exclusively related to innovation processes.

All other quotes match or miss the dimensions of the five indicator patterns, further demonstrating their grasp on collaborative innovation while it happens. As most in the centre, we see strong confirmation regarding the performance indicator of a shared vision (as measured by DIN 2) for a visible and manifest “We-Intention” claim; the visualisation of actors and activities (assessed by looking for boundary objects – DIN 3) and the mutuality of respect over increasing and decreasing intensity levels of collaboration (directedness and distance – indicator patterns DIN 4). In this, the quotes provide positive and negative specifications that strongly support that the tool tests the “the key is we” intensity in innovation processes.

### 3 Increasing evidence on “we is the key” and refinement of indicators

To obtain narrative material to test and refine the indicators and to improve their grip on different data was the aim of the small workshop exercise. In flexible innovation teams, from our exploration, it stands out that three indicator patterns are highlighted strongly by the narrative data of the discussing innovation experts. In the final tableau, we collect such quotes that highlight and refine DIN pattern indicators 2, 3 and 4 and find a variety of new performance description and emerging “We-Intention” (Triebel & Hürter, 2012).

Within the initial instrument of real-time evaluation (see table 2), deduced from long term and sustainable co-creation and reconstruction (C. Weber et al., 2015) the five dynamic patterns are of equal importance; in a timeline, however, most CIs happen in the chaotic initial periods marked by high time pressure. For short term collaboration, though, the findings stress importance of core indicators 2, 3, 4 and provide less evidence for relevant indicators of DIN pattern 1 and 5 in co-creation. They seem not to be necessary, as indicators to describe and comprise the complete “innovation journey” (Van de Ven, Polley, Garud, & Venkataraman, 1999) for successful indication of innovative short term collaboration in the same way.

Matching the obtained quotes from tables 3 and 4, the following positive and negative specifications were retrieved and collated to the indicators 2, 3, 4 and serve further specification with regards to the structure of data material.

**Table 8 - Specification of the indicators**

Indicator	Positive specification	Negative specification	Structure of data
DIN p. 2	“Shared values, shared goals”	“Omnipresent internet is distractive”	text, interview
DIN p. 3	“Visualisation of central acts and network actors”	“Expectations do not fit”	videos, text, pictures, flyers, websites
DIN p. 4	“Question can be asked and are addressed”	“Too much and not enough talking”	metric data

The narrative data obtained can further be used to outline action items and indicator questions to assess existing collaborative innovation teams in start-ups and flexible business innovation. Various indicator specifications to test (or to develop) a strong “We-Intention” - that characterizes successful innovation processes according to the focus group exercise - are inserted in the following outline.

Indicator 1 – Early identification of heterogeneous network-actors

- Which network-actors are most important for the activities?
- Which routines and technical infrastructure is used for your activities?
- Which actors are impossible to hide or omit?
- How many actors have full competencies/are fully backed by interests of their bosses?

Indicator 2 - Shared Vision

- Which values are most important to me/ to him/ to others – are these the same?
- Which values do we signal
- Are there many distractive perspectives?

Indicator 3 - Creation and mindful use of boundary objects

- Which objects dominate in communication?
- Which objects signal and activate the shared vision?
- Which objects will be used by most of the activities and actors
- Which buildings, achievements and objects are named and visualized?

Indicator 4 - Punctual directedness and distance

- In which moments could a breakdown of communication occur?
- And what happens if there is no more sign from one of the partners?
- How can the network cope with temporary absence and changing intensity of actors?
- What could mobilise trust and respect in such situations?

Indicator 5 - Focal role of implementing actors

- Who gets direct contact to the addressed cible group
- Are strategy and resource input of this actor characteristic for the network strategy?
- To which degree do other actors adapt to this strategic patterns
- Does the focal role change during the innovation process

## 4 Conclusions

In this paper, we presented an indicator tool for real-time assessment of collaborative innovation processes and tried to show how qualitative research can be used to validate and

refine performance indicators. We discerned performance (impact) indicators from output indicators mainly used by recent literature and evaluations and pointed to the lack of collaborative indicators (Shepherd & Patzelt, 2017) for successful non-linear and dynamic innovation processes.

Individual intention is a ‘best predictor’ for entrepreneurial achievement in survey research. We conclude from this paper’s explorative exercises that identification of an early entrepreneurial “We-Intention” is most indicative for successful and promising collaborative entrepreneurship. “The key is we” resumes this central dynamic attribute of emerging innovation networks as precondition for the achievement of innovative *regions* and economic growth.

In the collected quotes that validate and specify the five indicators, the paper collects further evidence on how failing and succeeding innovation collaboration is experienced and attributed to relevant dimensions. In the frame of the tested indicator tool, it was confirmed that there is need to moderate “goal and interest conflicts” in an initial stage by a shared vision and by the alignment of heterogeneous interests - as first of all requirements. “Mutual respect” and “visualisation” indicate a high quality of collaborative processes that succeed under uncertainty and resource scarcity, conditions that characterize entrepreneurial challenges and settings. From the narrative data obtained, a first specification of descriptions could be gained, which makes this small study serve as pre-test for setting up a broader indicator development study.

Indicator development is a necessary way to obtain methodological strength in empiric social research. In this respect, the presented exploration advances a new tool for measuring the emergence of DINs by indicator patterns of successful co-creation. Next studies can be set up on this.

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## **BARRIERS TO GREEN PRODUCTS PURCHASE – FROM POLISH CONSUMER PERSPECTIVE**

**Lucyna Witek**

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### **Abstract**

**Purpose:** The green market is growing rapidly, especially in developed countries. While in Poland the consumption of green products is not growing as fast as experts of this market predict. In this context, in the paper the results of studies that examine the attitudes of consumers towards green products and identify barriers to their purchase are analyzed. This research examines the propensity of consumers to buy environmentally friendly products by means of socio-demographic indices.

**Design/methodology/approach:** For the purpose, the direct survey method and Focus Group Interview (FGI) have been applied. The survey was conducted between 1 December 2015 to 31 January 2016 using the direct survey method. The sample covered 390 adult consumers living in south - eastern and southern Poland. Four sessions of 1,5 hours each were conducted between May and June 2015. Each group consisted of 6 people.

**Findings:** These studies lead to the conclusion that Polish connote positively the care about environment and ecological products. The primary motivation for green consumption is health. Environmental protection plays a supporting role. The barrier to the development of green consumption is the general and fragmented consumer knowledge of green products, their labeling, certification and control. This affects distrust and their skepticism to green claims. Under these conditions consumers do not want to accept higher product prices. In addition, weaknesses in the marketing chain make green products invisible to consumers. In the Polish market products presumption and purchases of non-certified goods from the trusted source are gaining importance.

**Research/practical implications:** This study provides a valuable contribution to addressing the needs of producers and sellers in the market for green products. The results of the research can help managers identify important information about the process of making purchase decisions by consumers towards environmentally-friendly products. An aid in the development of marketing communication strategy and the improvement of existing marketing strategies.

**Originality/value:** A theoretical contribution of this study is to enrich the analysis of consumer behavior in the market for green products in the context of a developing country by identifying barriers to their purchase and a better understanding of the predictors of consumer behavior on the market for green products.

**Keywords:** sustainable development, eco-friendly lifestyle, green products, direct survey, Polish market, green consumer, barriers to purchase

**JEL Codes:** Q55, M31, I12

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## **Introduction**

One of the priority issues of the mankind is to find a way to manage and to provide the well-being for all people not to violate the basic processes of the biosphere that condition the quality of human life. Under these conditions the concept of sustainable development emerged, whose roots date back to the seventies of the last century. Stakeholders' interest in sustainability issues is growing. It results from increasing of their awareness of negative consequences of human actions on the environment and health. Many companies are trying to adapt to these trends by implementing sustainable development, social responsibility and management practices. The goal is to eliminate processes and activities that are detrimental to the environment, to adopt measures to save resources and to restore the environment to a sustainable balance. Consumers also take steps to reduce or eliminate potential negative social and environmental consequences. This has led to interest in the ethical, moral, social and environmental aspects of consumption (Agyeman, 2014; Witek, 2015).

Ecological consumption is one of the most characteristic trends for modern times and it involves the consumer's interest in influencing their behavior on the environment and the incorporation of environmental aspects into the decision-making process by favoring products that minimize the negative impact on the environment. The green market is growing dynamically in the world. However, in Poland a slow increase in consumption can be noted. Causes of this phenomenon are related both to manufacturers and sellers as well as to consumers. The article focuses on the barriers to buy eco-friendly products by individual consumers. Positive attitudes of consumers towards green consumption diverge from real green purchasing decisions. The purpose of the article is to discuss whether economic factors are the primary barrier to the development of ecological consumption or the factors limiting the acquisition of ecological products are those related to the general, partial knowledge of organic production and its control and certification system, resulting in a lack of trust in certified green products.

## **1 Theoretical background**

The ecological effect and knowledge are important determinants of young consumers' ecological commitment and green purchasing (Kanchanapibul et al., 2014). Low consumer awareness of the environment and their concerns are currently factors that hinder sales of green products (Braga Junior et al., 2014). Fashion for ecology, the way to stand out, the growing prestige of being a friendly and modern consumer, all this makes people go for

environmentally-friendly products (Bednarova et al., 2016). The sense of danger and guilt affect the purchasing decisions for green products (Kabadayia, 2015). The reputation of the company plays an important role in the decision-making process of the consumer. Consumers judge the credibility of advertising under environmental assertions (Thøgersen, 2000). Price and the lack of trust are among the most common identified barriers to green consumption (Hughner et al., 2007). Vantomme et al. (2005) have identified the reasons for low green consumption such as: lack of availability of green products, disbelief of green claims and lack of information. Under conditions of frequent use of greenwashing, consumers do not trust the ecological assurances of companies (Wier et al. 2008). The intricate and complex nature of environmental information can also be overwhelming for consumers (Moisander, 2007). Polish consumers who are "open-minded" prefer buying organic products more often, while consumers who value comfort and price in their dietary choices are less inclined to buy organic products (Żakowska-Biemans, 2011).

In the Polish market the most important barrier to purchasing ecological products is lack of availability, lack of trust and high prices. Pilarski (2009) even states that despite the widespread interest in green products in the media, science and business practice, green products are invisible, which results from the fact that barriers are built between the first and second link in its marketing chain, leaving little chance of further market flow (promotion and distribution, acceptance of higher prices by consumers). In addition, poor cooperation between them and a small range of products pays no attention to the remaining links. In qualitative research, the respondents surveyed pointed to high prices as a primary barrier to purchase (Pilarski 2009).

## **2 Methods research**

The purpose of the study is to characterize attitudes and behaviors of consumers towards organic products and to identify barriers to their purchase. For the purpose of the survey the direct survey method and Focus Group Interview (FGI) were applied. The survey was conducted among 390 adult consumers, who were residents of southern and south-eastern Poland. The study was done between 01 December 2015 and 31 January 2016. The research sample differentiates demographic and social characteristics such as gender, education, place of residence, number of people in the family and financial situation (Tab.1). The Focus Group Interview (FGI) qualitative research methodology was used to deepen the aspects of quantitative research related to the barriers to purchase organic products. Four sessions lasted 1,5 hours between May and June 2015. Each group consisted of 6 people.

The hypotheses were formulated as follows:

H1: Consumers have positive attitudes towards green products.

H2: Consumers knowledge about green products is low.

H3: Consumers are willing to pay more for eco-friendly products.

H4: They do not believe in the environmental claims of the manufacturers, they see the motives of these actions to increase sales and create a green image.

H5: An alternative to purchasing certified green products is presumption or purchase a trusted source without a certificate.

H6: Age, education and income affect the regular acquisition of certified environmentally-friendly products.

**Tab. 1: Socio-demographic characteristics of sample**

Demographics	Per cent (N: 390)
Sex	Female: 56, Male: 44,
Age	18-24: 15, 25 - 29: 21, 30 - 39: 12, 40 - 49: 22, 50-59: 19, 60 and more: 11
Financial situation	Bad: 8; Average: 33, Good: 45 Very good: 14
Level of education	Primary: 3; Vocational:26; Mean:34; Higher:37

Source: own research.

### 3 Findings

Ecological products are connoted as higher quality products, but available to all. Only 23,8% of respondents said, that these products were only for the rich. In general, price plays an important role in making purchasing decisions. Only 32,1% of the participants declared their trust in green products. As many as 45,6% of respondents did not comment on this topic. 22,3% of consumers expressed the lack of trust. A large group of respondents (61%) believe, that companies are focused on creating a green image and increasing sales rather than protecting the environment. More than half (54,5%) of the participants feel overwhelmed by environmental information and feel lost. A similar group (51%) is not sure whether the eco-label always guarantees ecological product characteristics. Only 21,1% of respondents know how to produce and control organic products (Tab. 2).

One third of the respondents (32,3%) assess whether the product is environmentally friendly. A large group (61%) declares that they take action to protect the environment. But only 24,4% buy green products regularly. A slightly higher proportion of respondents (43,1%) are willing to pay higher prices for eco-friendly products. As many as 47,4% of consumers declare that they produce ecological products themselves. A very large group (76,7%) admit to

buying non-certified green products from a trusted source (Tab. 3). Socio-demographic characteristics determine the regular acquisition of environmentally-friendly products (Tab. 4).

**Tab.2: Details of consumer's attitudes to green product (%)**

Responses	Strongly agree	Agree	Neither nor/not answer	Disagree	Strongly disagree
Ecological products help to protect the environment	27.7	55.2	10.6	5.0	1.5
If I do not have the knowledge about the green product I'm inclined to choose a product with an eco-label	12.1	37.9	23.6	16.4	10.0
Price is an important factor when choosing a product	29.0	49.0	8.0	10.0	2.0
I am lost in the infoglut about environment	11.5	43.1	34.8	8.0	2.6
I have confidence in certified green products	14.1	18.0	45.6	16.9	5.4
Companies use eco-labels to create a green image and increase sales rather than protect the environment	17.9	43.1	22.1	11.0	5.9
Environmentally friendly products are of higher quality	24.4	35.4	19.5	9.7	8.9
I'm not sure whether the eco-label guarantees the ecological features of the product	19.8	31.2	14.4	25.2	9.4
I know how to produce and control green products	10.0	11.1	52.5	16.9	8.5
Environmentally friendly products are only for the rich	11.8	12.0	21.3	42.9	12.0
Products marked as eco-label are healthier for me and my family	23.1	51.3	12.6	10.0	3

Source: own research.

The research by FGI has shown, that the researched groups generally associate the concept of "green consumer" and "green product". Green consumer according to the surveyed groups is consumer who protects the environment, health, cares for animals, buys second-hand products, participates in charity. It is a frugal consumer, caring, healthy, rich, good, a social person. On the other hand, the following features have been assigned to a non-green consumer: ordinary, indifferent, unconscious, traditional, struggling with everyday problems, not rich, not thinking prospectively, having no time, manipulative. The environmentally-friendly product has the following qualities: healthy, environmentally safe, recyclable, no chemicals and additives, no preservatives, not tested on animals, cultivated in a small farm, exclusive, hard to access, ethical, quality product, specially marked and certified, recyclable, with a higher price.

Non-green products are "with impurities, preservatives, colorants, flavor improvers, rather unhealthy, low price".

**Tab. 3: Details of consumer’s behaviour to green product (%)**

Responses	Strongly agree	Agree	Neither nor/not answer	Disagree	Strongly disagree
When buying a product I consider the impact on the environment	8.0	24.3	25.7	27.9	14.1
I protect the environment e.g. by segregation of waste, energy saving, gas etc. .	23.1	37.9	26.9	7.7	4.4
I regularly buy green products	11.3	13.1	43.9	15.9	6.2
I'm ready to pay a higher price for an eco-labeled product	18.0	25.1	23.1	26.9	7.7
I produce organic products myself	21.5	25.9	21.0	19.0	12.6
I buy products from the so-called reliable source, but without eco-labels	24.4	52.3	7.4	12.1	3.8

Source: own research.

**Tab.4: The results of Kruskal - Wallis Anova Test and Mann - Whitney U Test\***

Variables	Gender*	Age	Education	Financial situation
	p –value			
I regularly buy green products	<b>0,031</b>	<b>0,002</b>	<b>0,023</b>	<b>0,001</b>

\*In the table there are test results of Kruskal – Wallis Anova Test for all cases except for gender, where the Mann – Whitney U Test was applied.

Source: own research.

Among the motives of buying green products, the consumers surveyed indicated "I care about the family; I have children; I care about the planet; I want to live in a pure world; I care about my health; My child has allergies; I want to eat safe products; This is my lifestyle; I am vegetarian; It reflects my personality; These are my life values; I want to live longer; I'm afraid of cancer".

Consumers are aware that the environment is a value, but they admit that they are giving up green purchases because they are not in the stores where they buy the most, they cannot afford them, they themselves are able to breed or make many products. They often buy cheaper alternatives because they are not sure whether eco-friendly products have ecological features or are just marketing tricks. In addition, there were statements: "I do not have time to drive

around the city to buy the proverbial three products; It's just fashion; I have my habits; Products are too expensive; They can only be purchased in a few places in the city". When asked why other consumers do not buy, respondents answered that because of higher prices, lack of awareness, indifference, habit and lack of availability. In addition, it was pointed out that "organic products are invisible to consumers"; " Environmentally-friendly products cannot break through the mass of other products in the market". The following statement seems to be interesting: "I think there are too few advertising campaigns that would make people aware of the difference between green and non-green products".

When asked if the respondents had a higher monthly salary by 50%, would they increase their purchases of organic products? Generally, they gave an affirmative answer, although they admitted that they had many other needs. The groups studied were asked about motives for buying products from trusted sources and prosumption. The most common words were: "so much healthier and cheaper; I save time; It is not known if purchased in the store are of higher quality, but these are certainly cheaper; I have limited confidence in the organic products available in stores". When asked how the respondents recognized the green products, they answered: "we recognized the leaf, the label, the eco-label; I read the information on the label; I always buy in a specialist shop; It is difficult to recognize them".

## **Conclusions**

The results of these studies give an inconsistent picture of the green consumer. On the one hand, consumers declare positive attitudes towards the environment and eco-friendly products, and on the other one they show lack of trust and real commitment to green consumption.

Health care is emerging as the main determinant of the purchase of green products. The statements of the consumers surveyed force the question whether consumers distinguish between organic and functional foods. The answers of the respondents raises doubts as to whether the term "organic product" is not synonymous with the term "healthy product". Being aware of the impact of environmental pollution on health and safety causes an interest in organic shopping. Altruistic motives play a supporting role in the Polish market. Environmental issues are not yet very widespread and characteristic for many consumers. This situation leaves many challenges of marketing communication. They can be triggered, reinforced through communication activities. Consumers need to clearly understand and appreciate the benefits of green products. The message should be formulated according to the target audience which it is addressed to. If the target market is more prosperous and recognizes the value of the biosphere,

environmental appeals should be underlined. For occasional consumers, personal appeals and personal benefits are more effective (Royne et al., 2012).

The barrier to green consumption is not only a lack of trust and high prices for organic products, but also poor market availability. The distribution and information sphere is the weakest link in the market for eco-friendly products. Large spatial distances, large distances between one and the other links, weak co-operation between them and a relatively small product range offer no interest from other links, including consumers. (Pilarski, 2009).

In Poland, the process of ecological consumption development is quite slow. In other highly-developed countries the demand for organic products is high. This is due to the higher material status of Western societies, their higher ecological awareness and cultural determinants. In Poland, the ecological knowledge of consumers is low. It is general and fragmentary, especially among older generations, because for many years they did not care about environmental education. At present, this translates into lack of knowledge of the eco-labeling, certification and control of organic products. Consequently, the process of identifying and purchasing organic products is difficult. This deepens consumer skepticism towards organic products rather than builds trust in certified organic products. In Poland, in the market of organic products, research has indicated the importance of presumption and the purchase of non-certified products (Witek and Hall, 2016). However, these issues require further exploratory research.

The development of ecological consumption in the coming years will deepen, which is due to both objective and subjective factors. The first one include the deteriorating state of environment and its effects (e.g. smog, climate warming, rapidly decreasing animal populations), whereas the second ones concern an increase in environmental awareness of consumers, the adoption of environmentally-friendly lifestyles and the interest of other stakeholder groups.

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## OPEN INNOVATION INTERMEDIARIES – CURRENT ROLES AND BENEFITS

**Marian Zajko**

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### **Abstract**

**Purpose:** The paper aims at clarifying the changes in the role and benefits of selected prominent US. and European open innovation intermediaries in technology market in the period 2010-2016.

**Design/methodology/ approach:** The changes in the role and benefits of selected open innovation intermediaries in time are analysed by their key characteristics using the case study design and the secondary data from websites and related publications on twenty intermediaries out of several hundred in the market.

**Findings:** The total number of open innovation intermediaries has grown during the past decade to several hundreds. The analysis of selected prominent US. and European intermediaries confirms strengthening European competition, global focus, continuing business growth with broadening of portfolio of services, and building strategic partnerships and communities around online platforms.

**Research/practical implications:** The primary aim is to fill up the gap in the research and publications on open innovation practices, especially on open innovation intermediaries and their benefits for companies. The secondary aim is to increase the interest in benefits of open innovation practices and related innovation intermediary services among the Slovak companies and give incentives to the Slovak government bodies to integrate measures on open innovation support in the national innovation policies.

**Originality/value:** The findings and conclusions in the paper may be used as an impulse for government bodies and innovation agencies in Slovakia to expand the current innovation policies for promotion of open innovation methods and models. This can foster innovations in SMEs with insufficient R&D capacities mitigating their innovation risk at the same time.

**Key words:** open innovation practices, open innovation intermediary, open innovation platform

**JEL Code:** O32

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## Introduction

The Research and Innovation Strategy for Smart Specialisation (RIS3) of the Slovak Republic passed in 2015 does not consider any explicit implementation of the open innovation concepts, methods and models. These topics have not been given appropriate attention either by the Slovak academic and research sphere or by the business sphere. The largest European innovation support service, the Europe Enterprise Network (EEN), active in Slovakia as well, addresses the innovation challenges of SMEs mainly by organising sector-specific brokerage events or clusters. EEN support services are labour intensive, the available resources are small, so the level of support provided to new company collaborations is limited and they often fail to realise their potential. However, the companies in the leading innovator countries have been increasingly using the benefits of open innovation via services of open innovation intermediaries (OIs) which have been operating and growing in this new market since the year 2000 and these topics have been analysed in numerous publications.

The analysis of the changes in role and potential of selected leading OIs in the technology markets of USA, France and Germany during the period 2010–2016 will be based on the case study approach based on Eisenhard (1989) consisting in the following steps:

1. The research question: Have the key characteristics of business focus of current open innovation intermediaries changed compared to their status in in 2010–2012 and to the classification of innovation intermediaries (Table 1)? If so, how?
2. Selection of cases: Unlike the situation in 2010-2011 when the North American OIs dominated the technology market, currently they face the ever-stronger European competition. Due to the limitation of the paper there were selected five prominent global players from the broad gallery of OIs, three from the USA, one from France and one from Germany to represent the growing European market and present broader scale of industries and services.
3. The collection of current data and following analysis were based on a different pattern of analysis than that used by the preceding authors. Beside a brief description of an OI it concentrates on portfolio of services including strategic partnerships, client base, community, and revenues.
4. Hypothesis: the development of the OIs in the period under investigation brought about the following changes: a) currently, the more or less distinct types of innovation intermediaries stated in Table 1 cannot be observed now, since the current OIs represent a fusion of features of intermediary types due to

development of their service portfolios; b) growth of competition among OIIs with global focus in terms of their number, business strength and territory; c) OIIs broadened portfolio of their services in response to their clients' demand and strengthened their position with clients by building strategic partnerships and communities; d) OII's increased their revenues in the period under analysis.

5. Conclusions are based on the results of steps 1 to 4.

## **1 Open innovation forms and benefits**

Markets for technology enable „*transactions for the use, diffusion, and creation of technology. This includes transactions involving full technology packages (patents and other intellectual property and know-how), patent licencing, transactions involving knowledge that is not patentable or not patented (e.g., software, or the many non-patented designs and innovations)*“ (Arora et al., 2002, p.117). They can be characterised by the following aspects: (1) purpose, e.g. circulation of existing technologies or creation and co-creation of new technologies; (2) type of technology transaction, e.g. from licencing up to comprehensive agreements on collaborative development of new technology; (3) the actors involved, e.g. businesses, individuals, universities, government bodies and technology/innovation intermediaries.

Since 2000 open innovation (OI) concepts, methods and models and their integration in the processes and structure of organizations have become an increasingly important topic not only in the literature on innovation management but in the business practice of many leading companies as well. Companies can achieve economic benefits from expanding their in-house innovation activities through inbound, outbound or coupled open innovation processes. The inbound processes bring in external ideas and technologies into the company innovation process, outbound processes make possible for internal ideas and technologies not used by company to be exploited by other companies. The coupled processes represent combination of inbound and outbound processes. In 2003, one of the OI pioneers, corporation Procter & Gamble (P&G) launched the OI programme “Connect+Develop”. In ten years it brought in more than 2,000 global partnerships, delivered dozens of global innovative products to consumers, accelerated innovation development and increased productivity, both for P&G and its partners. This trend was reinforced in 2013 by launching a new website ([www.pgconnectdevelop.com](http://www.pgconnectdevelop.com)), linking innovators from all over the world directly to P&G – whose Business Development Team then thoroughly reviews submissions and provides prompt feedback. The Connect+Develop is directed towards IP-protected ideas, rather than simple

ideation or crowdsourcing. The program has brought the company the following benefits: (1) it facilitates innovation beyond the areas of P&G's expertise; (2) it offers innovative ideas that improve product quality in advance of commercial release; (3) it reduces risks by transforming potential competitors into collaborators, e.g. a collaboration between Clorox's sales and marketing team and P&G's research and development team maximized value creation; (4) it accelerates the monetization process (Morgan, 2015).

## **2 Typology of open innovation intermediaries**

The previous literature (Verona et al., 2006, Nambisan and Sawhney, 2007, Lopez-Vega, 2009, Diener & Piller, 2010) provides several suggestions on classification schemes of the extensive and diverse domain of intermediaries. Lopez-Vega & Vanhaverbecke (2009) offer the typology of emerging innovation intermediaries by their business models defined by the following set of characteristics: value proposition, value chain and network, market segment, competitive strategy and revenue model. They arrive at four basic types of innovation intermediaries: innovation consultants, innovation traders, innovation mediators and innovation incubators.

Diener & Piller (2010) elaborated a deeper classification of innovation intermediaries based on three criteria: environment, content of traded knowledge and type of funding. It results in six basic types of intermediaries (Table 1). The business incubators are beyond the scope of this analysis. The other five types will be described in more detail, since this classification serves as benchmark for comparison with characteristics of selected OIIs treated in the section 4 of this paper in order to show their changes compared to the year 2010.

1. Co-operative Technical Organizations (CTO) create special purpose innovation networks from various actors within an industry sector. They act as facilitators of innovation reducing the uncertainty around new ideas and may take three forms: technical committees (established by professional societies), task forces (established by industry trade association), and standards bodies (collaborative organizations binding together diverse actors in an innovation network).
2. Knowledge Intensive Business Services (KIBS) such as consulting organisations operate across industry sectors using their accumulated knowledge, network position and wide range of contacts in solving problems of their clients.
3. Innovation Brokers (IB) are usually independent non-profit organisations operating in physical environment as a member of a network of actors in an industrial sector

that is not focused on the innovation generation or implementation, but on enabling other organizations to innovate.

**Tab. 1: Classification of innovation intermediaries**

Environment	Content specification	Funding type	
		Private funding	Public funding
Non-virtual environment	Within industry sector	Co-operative Technical Organizations, e.g. an industry association	Innovation broker, e.g. a lab for basic research
	Across industry sectors	Knowledge Intensive Business Services, e.g. consultancy firms like McKinsey, etc.	Business incubators, e.g. Cambridge science park, DFG research association
Virtual environment	Within industry sector	Virtual Knowledge Broker, e.g. Customer Network Operator, Customer Community Operator, Innovation Market-Place Operator	-
	Across industry sectors	Virtual Knowledge Broker, e.g. Customer Network Operator, Customer Community Operator, Innovation Market-Place Operator	-

Source: (Diener & Piller, 2010)

- Virtual knowledge brokers (VKBs) take advantage of the internet communication that enables broader and more efficient integration of external actors. Operating in a virtual space allows them to connect with a great number of actors and gather complex information. They can operate in three forms (Sawhney et al., 2003). The Customer Network Operator works as an online market research organization and supports innovation in companies by providing them access to special user segments for feedback. The Customer Community Operator is an intermediary specialized on building communities to connect business with people on the basis of common interests. The Innovation Market-Place Operator connects sellers of intellectual property with potential buyers. Service portfolios of current prominent VKBs usually cover combination of all these three forms.

### 3 Open Innovation Intermediaries

Open innovation intermediaries (OII), referred to also as virtual knowledge brokers, are companies that help other companies implement various facets of open innovation to fully exploit the benefits of the mutual action and mitigate the disadvantages and risks for the participating companies. They are process coordinators with strategic innovation capabilities: matchmaking and innovation process design, management of collaborative projects, project valuation and portfolio management (Chesbrough, 2006). Most often the established OIIs also operate a software platform supporting their service portfolio. The role of innovation intermediaries is relevant in all the phases of the OI process: identify the proper business models, facilitate outward and inward technology commercialization, match innovation demand and supply, understand customers' needs and assess external market, assist in developing results into commercially viable services, products or processes to develop business plans and approach investors and other business players. Based on their 2013 survey Diener & Piller (2013) estimated the size of the market of OI services €2.7bn with growth prospect to €5.5bn by 2015.

In line with Diener & Piller (2010) we define innovation intermediaries as actors specialized in the articulation and selection of new technology options; in scanning and locating of sources of knowledge; in building linkages between external knowledge providers (innovation solvers) and their customers (innovation seekers); and in developing and implementing business and innovation strategies. The most advanced technology and innovation market with important global OIIs remains the USA, Europe and Japan lag behind. The previous literature contains only a few analyses of open innovation intermediaries in the papers of Hacievliyagil et al (2007), Diener & Piller (2010), Hossain (2012) Diener & Piller, (2013), and Tindara, A. et al (2015).

### 4 Case studies

#### 4.1 Case: NineSigma, Inc.

**Brief description** (NineSigma, 2017). The company was founded in 2000 and is based in Cleveland, Ohio with additional offices in Japan, Australia, South Korea, South Africa and Belgium. It designs and manages open innovation solutions for organizations in the public, private, and nonprofit sectors and claims to be the market leader among the OIIs. Estimated number of employees: 117 to 200. Its main competitors are: yet2.com (US.), Ideaken (Singapore), Venadar (US.), Ideapoke (US.), and Strategic Allies (US.).

**Portfolio of services.** Compared to the analysis in Hossain (2012) the company abandoned several services and increased their scope by new ones to better meet the needs of

clients. Core company services remain NineSigma Grand Challenge, i.e. a technical call to action to identify transformative technology and development opportunities through open collaboration with the global innovation community; Innovation Contest, a solution that employs integrated marketing and PR elements to enable a sponsoring company to identify a community of innovators; and a new human-centered iterative methodology Open Design Thinking that leverages external ideas and resources to improve the success rate of new product development. It still provides Technology search based on Requests For Proposals(RFPs) supplemented by Managed Innovation Gallery, Technology Landscaping, Expert Advisory Services, workshops and trainings, Leadership summit, Economic Development Programs, Partner services, Industry and Technical Experience, and Services for US. General Services Administration. The company maintains strategic partnerships with companies Caliper and Nottingham Spirk. *NineSigma, Inc. has features of VKB, IB and KIBS and provides predominantly inbound innovation services with some coupled innovation services through alliances.*

**Solvers.** Anonymous persons and their awards are based on agreement with OII and/or client.

**Client base.** It serves Fortune 500 multinational corporations, middle market companies, entrepreneurial start-ups, government, and not-for-profit organizations; the U.S. federal agencies, including the NASA Center of Excellence in Collaborative Innovation, the Department of Homeland Security, and the Department of Defense. The clients are from broad range of sectors: aerospace and defense, automotive, chemicals and materials, consumer products, energy, oil, and gas, food and beverage, high tech, and materials technology; pharma, healthcare, and medical products; and adhesives, sealants, and surface treatments. It appears that large companies and organisations prevail as clients. NineSigma announced in January 2016 that 54 of its clients have been named to the Thomson Reuters 2015 Top 100 Global Innovators list (48 clients in 2014) NineSigma (2016). The strongest domains of expertise of NineSigma are health, energy, and sustainability sectors. Most visitors to their website come from USA (20.2 %) and India (8.9 %) and the latest estimated **summary traffic in their website made 212,000 sessions** per month (www. alexa.com).

**Community.** The secure collaborative global online community platform NineSights, started in 2012, connects solution providers (innovators) with resources and solution seekers to view needs and RFPs and build real-time partnerships. It embraces more than 2 million registered solution providers worldwide predominantly from businesses (52 %) and universities

(34 %). It is a distinguishing feature of the NineSigma, Inc. and its innovators have developed more than 35,000 solutions for clients up till now.

**Revenues.** It charges a discovery fee and a success fee as well as fees for other provided services based on a signed contract. In 2015, the company was again named to the Inc. 5000 List of Fastest-Growing Private Companies in America (3-year growth of 46% and revenue of \$13.5m). The estimated revenues in 2016 dropped to the level of USD 7.9 million (www.owler.com).

#### 4.2 Case: yet2.com Inc.

**Brief description** (yet2com, 2017). The company was founded in 1999 with original investments from Siemens, Bayer, Honeywell, DuPont, Procter & Gamble, Caterpillar, and NTT Leasing. It is based in Newton, Massachusetts and has offices in North America, Europe, and Japan. Estimated number of employees: 39 to 50. Its main competitors are: Innocentive (US.), NineSigma (US.), Intellectual Ventures US.), Ideaken (Singapore), and Ideapoke (US.).

**Portfolio of services.** Compared to the analysis in Hossain (2012) the company expanded its OI services, in particular OI consulting, besides own OI portal it hosts and manages OI portals for some of its big clients, e.g. Unilever, Ph. Morris or DuPont. Within technology scouting it offers strategic deal flow service, innovation tours and operates Virtual Innovation Hub in Boston. The company has a proprietary database of patent assignments and provides out-licencing and in-licencing services and intellectual property consulting to world-class clients around the globe. Its core service is yet2 online cross-industry global technology market place with several million innovative technologies and technology needs, connecting technology sellers, technology buyers and technology brokers since 1999. The company also carries out technology marketing and business development, and market validation and assessment, application suggestions, commercialization opportunities, joint or funded development, and possible funding services for small businesses. It also provides commercialization exposure for its network member companies. *It has features of KIBS and VKB and provides combination of inbound and outbound innovation services.*

**Solvers.** Anonymous persons and their awards are based on agreement with OII and/or client.

**Client base.** The web site has over 130,000 registered market place users including many of the Fortune 500. Besides large companies they also serve over 16,000 smaller technology companies. The strongest domains of expertise of yet2.com are technology transfer, open innovation, intellectual property, licencing, patents, idea submission management, idea

submission platforms, tours, and prize challenges. Most visitors to their website come from UK (38 %) and USA (31.3 %) and the latest estimated **summary traffic in their website made 8,070 sessions** per month (www. alexa.com).

**Community.** yet2.com has created by means of the **fully customised OI portal and submission management system** a wide network of open innovation partners covering many of the technology-rich countries around the world as well as relationships with open innovation organizations, technical expert networks, SME networks, technical magazines, online technical communities, and technology brokers. The company hosts and manages on this platform OI portals of its important clients, e.g. Unilever, DuPont, Philip Morris, Anheuser Busch and others.

**Revenues.** Fee structure is not disclosed. The estimated revenues in 2016 achieved \$24.3 million (www.owler.com).

#### 4.3 Case: YourEncore Inc.

**Brief description** (YourEncore, 2017). The company was founded in 2003 with original investments from Procter & Gamble and Eli Lilly, later also Boeing and is based in Indianapolis, Indiana. It has legal entities in the U.K. and Germany. Initially it was an online recruiting platform connecting members and non-members with retirees with deep expertise for short-term assignments. Estimated number of employees: 342. Its main competitors are Marketing Factory (US.) and TD International (US.).

**Portfolio of services.** Compared to the analysis in Hossain (2012) the company maintained its focus and service scope. YourEncore employs diverse mix of highly experienced technical experts, clinicians, entrepreneurs, and professionals with the expertise (to work as consultants on projects for clients in the USA and abroad. Their expertise must match the client needs and they must sign a confidentiality agreement prior to any discussions with clients. Projects may range from one-hour consultations to part- or full-time work for a year or more, based on client needs. Expert compensation may vary, it is influenced by project type, skills required, marketplace standards, and client expectations. The advisory services cover areas of clinical development, clinical operations, due diligence, medical affairs, pre-clinical, quality, regulatory, and safety/pharmaco vigilance; chemistry, manufacturing, and control. The company also provides services in the areas of consumer insights, intellectual property, licencing, marketing, packaging development, process and product development, food ingredients, product safety and regulatory affairs, health and nutrition, supply chain and manufacturing, and more. The company maintains partnerships with Roche, Alliance for

Clinical Research Excellence and Safety, Purdue Research Foundation (all US.), and Global Regulatory Services (UK). *It has distinct features of IB and KIBS and increasingly some of VKB as well. The company provides predominantly inbound innovation services.*

**Solvers.** Mostly retirees or senior scientists and their awards are based on agreement with OII and/or client. The company has more than 11,000 experts, thereof more than 7,000 with advanced degrees and several decades of experience across the globe.

**Client base.** YourEncore serves many of the top companies in the pharmaceutical and biopharmaceutical, medical devices, and consumer goods industries, e.g. 12 of the 15 largest life sciences companies. Its clients include many Fortune 500 multinational companies including Procter & Gamble, Eli Lilly, Boeing, and General Mills but also several fast growing, innovative mid-sized companies. Its industry focus is narrower than that of NineSigma or yet2.com.

**Community.** The YourEncore Innovation community operates as an online professional network that connects users with professionals in chemicals and materials. The Innovation Community features forums, blog, webinars, question posting, expert advisory boards.

**Revenues.** Fee structure is not disclosed. The estimated revenues in 2016 achieved \$78.5 million (www.owler.com).

#### 4.4 Case: SpecialChem S.A.

**Brief description** (SpecialChem, 2017). The company was founded in 2000 and is headquartered in Paris, France. It has subsidiaries or representatives in Atlanta, Los Angeles, and New Jersey in the United States; New Delhi, India; and Tokyo, Japan. Estimated number of employees: 180. Its main competitors are: DuPont (Innovation Centres and DuPont Ventures), STREM Chemicals (US.), MatWeb (US), Deloitte US. (Consulting for Special Chemicals and Materials).

**Portfolio of services.** The company operates an online network platform that connects users with professionals and suppliers of chemicals and materials. It includes a range of online services: large chemicals databases, newsletters, technical articles, on-line selectors, on-line seminars, and news. It helps chemicals and materials suppliers in search of commercial acceleration; marketing and communication professionals to deliver the right message, to the right person, and at the right moment from branding to customer engagement; professionals in open innovation for scouting new technologies or looking for out-licencing opportunities that are related to chemicals and materials. It provides advertising services to specifiers and

formulators for plastics and elastomers, coatings ingredients, adhesives ingredients, cosmetics ingredients, polymer additives, and bio-based chemicals and materials; and commercial acceleration to differentiated technologies and products. SpecialChem closed strategic partnership with MatWeb in 2013 and partnership with Gardner Business Media in 2016. *It has features of VKB and KIBS and provides predominantly inbound innovation services with some coupled innovation services through alliances.*

**Solvers.** Anonymous persons and their awards are based on agreement with OII and/or client.

**Client base.** The company has built up **technical websites** dedicated to several of the largest downstream markets for the chemical industry: plastics & elastomers, coatings ingredients, adhesives ingredients, cosmetics ingredients, polymer additives and bio-based chemicals & materials in line with the prevailing client profiles. Its industry focus is vertical compared to the horizontal focus of NineSigma and yet2.com. Most visitors to the SpecialChem website come from USA (17.7 %), India (10.9 %) and UK (5.6%) and the latest estimated **summary traffic in their website made 212,000 sessions** per month (www. alexa.com).

**Community.** SpecialChem claims to have the **world's largest online network** dedicated to chemicals and materials with over **575,000 registered members (70 % with technical background)** including engineers, formulators, product developers, marketers, applicators and brand owners across the globe. Joining the communities of SpecialChem and MatWeb enabled their clients to reach more than 1 million profiled professionals in chemicals and materials and take advantage of highly qualified traffic of over 10 million visits per year, by far the worlds largest number in this industry.

**Revenues.** Fee structure is not disclosed. The estimated 2016 revenue made \$5 million (D&B).

#### 4.5 Case: Hype Innovation

**Brief description** (Hype, 2017). HYPE Innovation is a Social Business Software vendor specialized on innovation management. It claims to be a global leader in enterprise social software for idea and innovation management. The company was founded in 2001 and is based in Bonn, Germany with a subsidiary in Cambridge, Massachusetts. Estimated number of employees: 62 to 200. Its main competitors are: Spigit (US.), Opal (US.), Innovation Cloud (US.), IdeaScale US.), and BrightIdea (US.).

**Portfolio of services.** Predominantly inbound innovation services, increased coupled innovation services through alliances. The Hype Platform for Innovation Management

comprises three software solutions. Hype Enterprise is a complete platform for innovation management from idea generation and evaluation to innovation project implementation. It combines social networking functionalities with a business value driven innovation management infrastructure to bring employees, customers and business partners together. Hype Go is a SaaS cloud solution to enable small to medium-sized organizations and individual departments of bigger enterprises to bring their employees, customers, or partners together to collaboratively solve problems and Hype Improve is designed specifically for companies who wish to manage cost saving and efficiency programs. It also provides collaborative innovation solutions, including idea management, innovation management, and open innovation solutions; business solutions, such as business innovation, process improvement, and partner innovation solutions; and training, implementation, and management consulting services. HYPE Innovation partners with IBM, TRENDONE, Jive Software and social hub Yammer to deliver the most complete innovation management solution to our clients. *It has distinct features of VKB and KIBS and provides predominantly inbound innovation services with some coupled innovation services through alliances.*

**Solvers.** Anonymous persons and their awards are based on agreement with OII and/or client.

**Client base.** HYPE has over 200 clients among enterprises and medium-sized companies in Europe, USA, the Middle East, and internationally. It serves financial services, consumer goods, medical, automotive, science and technology, engineering and manufacturing, telecommunications, energy, chemical, food, and service sectors.

**Community.** Hype clients are considered to be members of the Hype informal community. The company provides innovation blog, innovation management webinars and events.

**Revenues.** Fee structure is not disclosed. The estimated 2016 revenue amounts to \$2.5 million ([www.owler.com](http://www.owler.com)).

## 5 Conclusions

The results of analysis of case studies tie in the research results achieved by the previous authors and expand them. They confirm the research hypothesis in the following points: a) the more or less distinct types of innovation intermediaries from the period 2009-2010 (Table 1) cannot be observed any more; since development of their service portfolios the current innovation intermediaries are amalgamation of features of several intermediary types; b) the competition

among global open innovation intermediaries sharpens due to increase in their number and business strength of the European competitors, c) open innovation intermediaries broaden portfolio of their services in response to their clients' demand and strengthen their position with clients by building strategic partnerships and communities. However, the revenue growth of the open innovation intermediaries could not be confirmed or rejected due to non-availability of their annual financial statements and annual reports from trusted sources.

The growing demand for the open innovation services in the advanced countries worldwide is accompanied by increasing number of market players and expanding supply of these services supported by creation of software platforms, new strategic partnerships and communities. Their clients are not only large companies but increasingly mid-size and small companies. Slovakia as a moderate innovator within the EU should follow this trend and catch up with it.

The Slovak Research and Innovation Strategy for Smart Specialisation (RIS3) mentioned in the introduction follows four strategic objectives: (1) deepening integration and embeddedness of key major industries through the cooperation of the local supply chains into embedded clusters; (2) increased contribution of research to the economic growth via global excellence and local relevance; (3) creation of a dynamic, open and inclusive innovative society as one of the preconditions for the increase in the standard of living; (4) improvement of the quality of human resources for an innovative Slovakia. Each of these objectives is translated into partial objectives and related measures to achieve it but without any explicit mention of any open innovation concepts, methods and models, neither among the partial objectives nor the measures. However, open innovation concepts could enrich the RIS3, e.g. in the Measure 1.1 Development of innovative capacities through cooperation between enterprises and research institutions in key sectors of the Slovak economy, and foster realization of the Measure 1.3 Support for building research and innovation capacities in Slovak enterprises. Moreover, open innovation concepts tie in well with the following Measures: 2.3 Linking universities, Academy of Sciences, research institutions with business partners, 2.4 Support and stimulation of international cooperation in science and technology, 3.4 Support of open and inclusive society, 3.5 Support of dynamic business environment favourable to innovation, and 4.5 Stronger emphasis on education in fields relevant to the priority areas of this Strategy.

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## LONG TAIL THEORY VALIDITY ON SECONDARY CULTURAL GOODS MARKET

Martin Zelený – Jan Hanzlík

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### Abstract

**Purpose:** The following study is focused on the application of the long tail theory by Chris Anderson on the secondary market of cultural goods. The aim of the research was to investigate whether the original theory is completely valid on secondary cultural goods market or whether there are differences between Anderson's results, which were based on literature and music sales data collected from primary market online retailers like Amazon, iTunes, etc., and analogous research based on data from secondary market.

**Design/methodology/approach:** Our data set consists of past auctions data collected from the online marketplace eBay, specifically from British eBay UK and German eBay DE. We followed the original methodology to find out the differences. The research was complemented by the correlation analysis of prices, sales and overall popularity as well as by examination of the historical prices progress.

**Findings:** The application of the original methodology on the data from the secondary market resulted in similar tail shape, which basically confirmed the validity of the theory, however with significantly larger head part and other differences. Further examination revealed the fact that it is not the niche products, but rather the "mainstream" products that dominate the final sales. The correlation analysis of sales and prices also revealed strong non-linear dependence between price and quantity of sold items. Examination of the past price progress of selected group of items confirmed that slowly rising, but still limited supply creates a concretely defined market part that provides both investment and entrepreneurship opportunities.

**Research/practical implications:** The paper provides implications for further research of the secondary cultural goods market. As for practical implications, the paper defines a concrete part of the secondary market that provides both investment and entrepreneurship opportunities.

**Originality/value:** This paper fulfils the need to study how the differences between primary and secondary market affects demand, consumer behaviour and subsequently final sales structure.

**Keywords:** Secondary market, The Long Tail theory, cultural goods, consumer behaviour

**JEL Codes:** L11, L15, L81

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## **Introduction**

Even in the recent past, sales in many markets were dominated by only a small number of products that sold best. It was supposed that markets operated in accordance with the Pareto Principle, also known as the 80/20 rule. The principle describes the most common pattern of the concentration of sales: 80 % of sales are attributable to only 20 % of the most sold goods (Adorno and Bernstein, 1991; Brynjolfsson et al., 2011). Information technology and the advent of the Internet in particular, hence online markets, have the potential to gradually increase the proportion of marginal products in total sales, thus creating the so-called long tail in their distribution. Since 2004, numerous studies have explored the effect of this phenomenon, but the vast majority of these studies dealt with the validity and application of the long tail theory in the markets upon which the theory was founded, i.e. namely the primary markets in the Internet environment. The author of the theory wrote in his book about the possible applicability of the long tail theory on many other segments, including, among others, the Internet auction marketplace eBay<sup>55</sup>, which is engaged in brokering the sale of both the primary and secondary market (Anderson, 2008). The concept of secondary market in trade refers to the market with goods that have already been sold once, and in many cases were not held for sale (Gérard-Varet, 1995). To our knowledge, the application of the long tail theory on secondary markets has not been examined by anyone yet; therefore the aim of this paper is to verify the validity of the theory in its general context and also investigate how differences between primary and secondary markets affect the demand, consumer behaviour and consequently the final structure of sales.

## **1 The Long Tail Theory**

In 2004, Chris Anderson published the long tail theory, which explains the success of some distributors of symbolic contents while noting the paradigm shift of the economic exchange caused by the transition to virtual distribution channels. The author himself was convinced that already since the mid-twentieth century, the society has been establishing a strong focus on selected products, which could be called hits or stars, and the products of mass culture in general. Although already in the 1960s studies were published on alternative cultures that denied the possibility of a homogeneous audience, mass culture in fact strongly dominated markets even in the very recent past (Brynjolfsson et al., 2010; Fleder and Hosanagar, 2009). The main reason for the inability to create an supply reflecting the highly heterogeneous

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<sup>55</sup> Here the author presents eBay as a long tail both of vendors and sales (Anderson, 2008).

composition of demand was the considerable scarcity of capacity of distribution channels, which limited them to physical stores, radio and television frequencies and so on. Therefore, the digital distribution meant a fundamental change for many markets. The long tail theory was constructed on a data from several servers that sold intangible cultural content, i.e. music and books, especially in electronic format. The research revealed that virtually every book or a song has been in a certain amount of time purchased at least once. It refers to the fact that the supply is now able to largely cover the heterogeneous composition of demand, at least in some sectors. The most significant conclusion of the Anderson's research is the fact that in the examined case of the U.S. distribution server Amazon revenues from sales of songs of marginal genres exceeded sales of hit singles and leading products of the mass culture (Anderson, 2008).

Through this argument, Anderson challenged the – formerly generally accepted – validity of the Pareto principle, because according to his research, the best-selling products are not able to generate even half of the total income any more. Later studies related to Anderson's work showed that the ratio of total income grows in favour of the tail. This points to the growth in the diversity of products, which is most likely a long-term trend (Fleder and Hosanagar, 2009). The validity of this theory is, however, subject to low distribution and storage costs, as well as the necessity of the presence of production of mass culture (Anderson, 2008).

## **2 Methodology and data**

The initial intention was the reapplication of the original methodology by Chris Anderson, which led to the formulation of the long tail theory, to the secondary markets with products of a cultural nature. The methodology employed by Anderson's team consisted of analysing very large data set by examining the relationship between two fundamental factors, i.e. the popularity of individual products in terms of number of units sold and the order of the product in total sales. This methodology is mostly based on the huge amount of data<sup>56</sup>, and a high information value of the sample does not require too complicated analytical methods for obtaining highly relevant results. However, it is to be assumed that Anderson worked with the primary market data, moreover, obtained from a single source that adheres to certain rules for formatting and allows relatively easy subsequent research.

In contrast, the research capabilities of the secondary market are vastly different. The actual acquisition of data from distribution channels limits the possible data sources actually only to Internet auction marketplaces. Certain options in this regard are provided by eBay,

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<sup>56</sup> Generally, hundreds of thousands of records.

which is the world's most successful representative of this category and, moreover, usually provides its data to third parties, which further offer them to end users. Deeper research is for example allowed with a product by Terapeak Inc., which offers relatively good statistics on user searches, and then with individual auctions provides specific date, number of bids and the realized price, nevertheless, it completely ignores views and auction monitoring (Terapeak, 2017). These are considered irrelevant by some, however, for the purposes of this research they are considered very important (eBay, 2012). Yet eBay is fairly open in providing a limited data for research purposes. Based on discussions with a representative of eBay Research Labs division it was necessary to accurately describe the purpose and expected outputs of the research and limit the required data to one selected subcategory, the current six-month period of time and only a few specific parameters. Given the focus of one of the authors of the contribution the subcategory Musical Instruments / Guitars and basses, the condition manufacturer refurbished, seller refurbished, used and for parts or not working, the type of sales Auction, geographic limitations to the European Union have been finally selected. As for the parameters name, date of issue, price, number of additions to Watch list and number of auction site views were selected.

A sample containing 49,401 auctions realized from 1 July 2016 to 31 September 2016 has been provided. The unrealized auctions were not included in the sample because the original theory does not reflect on them and therefore they are irrelevant for this research. Collected auctions were divided into groups according to duplicities in the auction Title which were then ranked according to the frequency from the highest to the lowest. Consequently, data were subjected to manual inspection to eliminate possible errors caused by a wrong description, because the auction Title is created solely by the vendor and eBay does not revise them subsequently. These adjusted data were used for the performance of the analysis of sales volumes and total order of sales volume, the results of which have been generated by questions regarding the factors affecting overall sales.

Using the correlation analysis, the influence of the price on sales volume has been investigated. Results thus obtained became an inspiration for further analysis, similar to the initial one; however in this case the variable was the popularity instead of the sales volume. The popularity factor was divided into two elements, namely the number of page visits and the number of site monitoring. Examining the dependence of both elements revealed a very high linear dependence between the number of site visits and the number of site monitoring, therefore attempts to create one ratio index were abandoned, as for the desired particular solution, the two factors are essentially interchangeable. Similar results although with lower

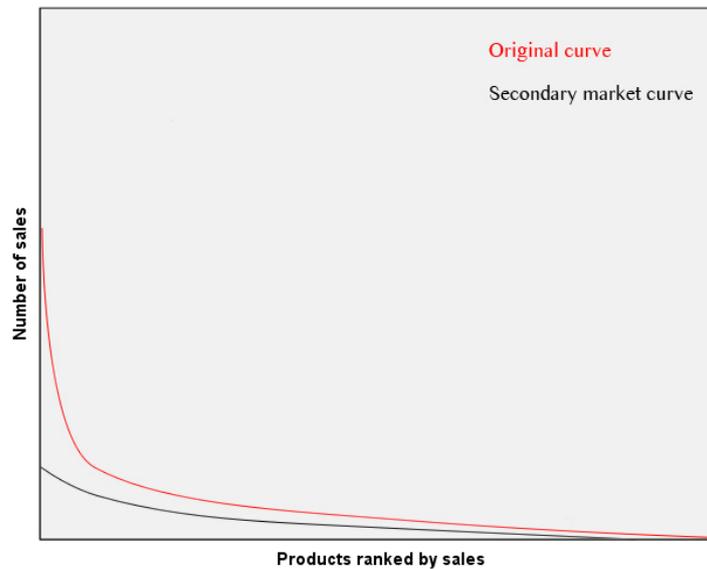
levels of dependence have been obtained by the correlation analysis examining the relationship between the popularity and the final selling price.

In the last part of the research, we focused on the possibility of using the acquired knowledge in practice for the investment-entrepreneurship activity. Product prices in selected product groups were subjected to examination in terms of time and on the basis of this a part of the product range of the secondary market was defined, which has the greatest potential for the investment- entrepreneurship activity.

### **3 Results**

The graphical representation of the results of the analysis of sales reveals the shape of distribution curve similar to the long tail distribution. The difference is, however, evident at first glance (Fig. 1). Especially the head portion of the curve appears to be virtually collapsed compared to the head portion in the original theory. First of all, the highest sales volume reached – as the maximum – the values of several tens of sold units; ultimately we can talk about the long tail distribution, where the tail takes over not only over the half of total sales, but completely dominates the sales.

Chris Anderson works with relatively homogeneous markets of music and literature, in which there are no major differences between products, apart from the content itself. In the case of music we can even talk about the fact that from the commodity point of view these are almost perfectly homogenous products. This homogeneity is characterized by minimal differences depending on the author and the length of the tracks and possibly format, which however the buyer can choose, thus meeting his requirements and possibilities. These are essentially products, which are characterized by the same availability with the same subsequent application and a very similar price level, which also applies analogously to the literature market. As already mentioned, the main differentiating feature is therefore merely the content itself. Moreover, these are products that can be inexpensively in almost unlimited way duplicated and their supply can meet the demand without difficulty.

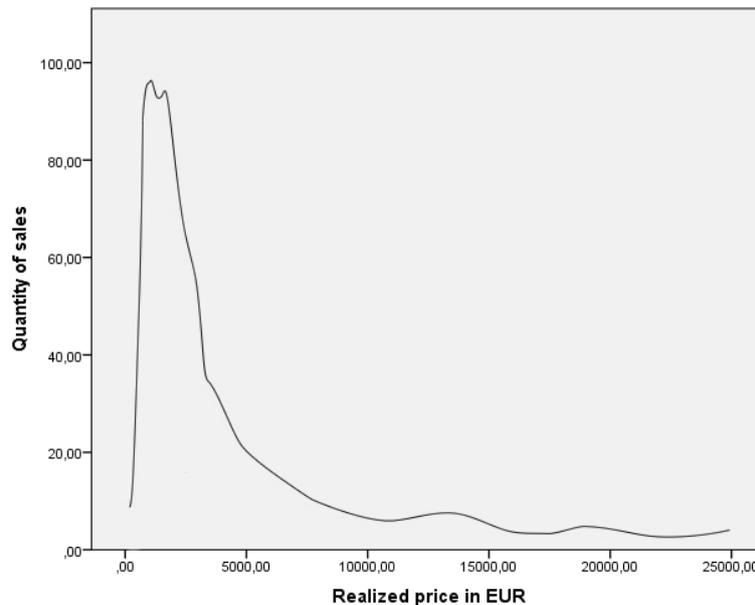
**Fig. 1: Comparison of the curves of primary and secondary market sales distribution<sup>57</sup>**


Source: Authors

In the case of secondary market, whether the selected market with musical instruments, art market or any other commodity, however, the differences are obvious. Musical instrument as a commodity is also a relatively homogeneous product, especially if the choice is narrowed down to a specific type, as is the case in this study. The resulting distribution of sales among other factors, which are marginal in relation to the principal factor, dramatically reflects the limited nature of supply, which significantly modifies the long tail distribution. The established curve in the case of the examined file at the same time characterizes limits of the supply of each specific product.

Limited demand is also reflected in the price of goods, which in case the supply is insufficient in terms of the demand naturally increases. This leads to the fact that some products become unavailable both in terms of supply and price, which is the case of higher priced products. The analysis of the price impact on the volume of sales showed that the best-selling products are moderately priced, one could say the products of mass production (Fig. 2). Low sales of higher priced products are justified above; low sales of lower price category products are due to their low popularity, which arises from the following text.

<sup>57</sup> Considering a significantly different amount of investigated data both curves have different values; the objective is to show the proportional differences.

**Fig. 2: The impact of realized price on the quantity of sales**


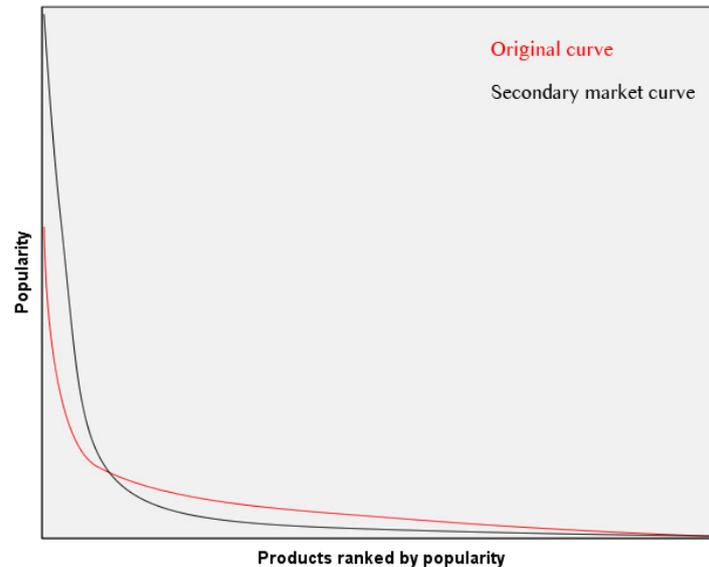
Source: Authors

In order to go beyond the restrictions imposed by the limited supply, it was necessary to focus on the popularity of products. Here we had two factors, namely the number of additions to Watch list and viewings of individual auctions. Exploring the relationship between the two factors showed their very high linear dependence and the resulting de facto interchangeability; for this reason, the number of viewings of individual auctions was used in subsequent research. The resulting curve theory surprisingly does not confirm the long tail theory; on the contrary, it attests to the Pareto principle (Fig. 3).

Consequently, we can say that if the investigated secondary market was not limited by the limited supply, the demand would *ceteris paribus* likely to focus on only one selected group of products and would nearly perfectly meet the original idea analogous to the company's focus on products of mass culture.

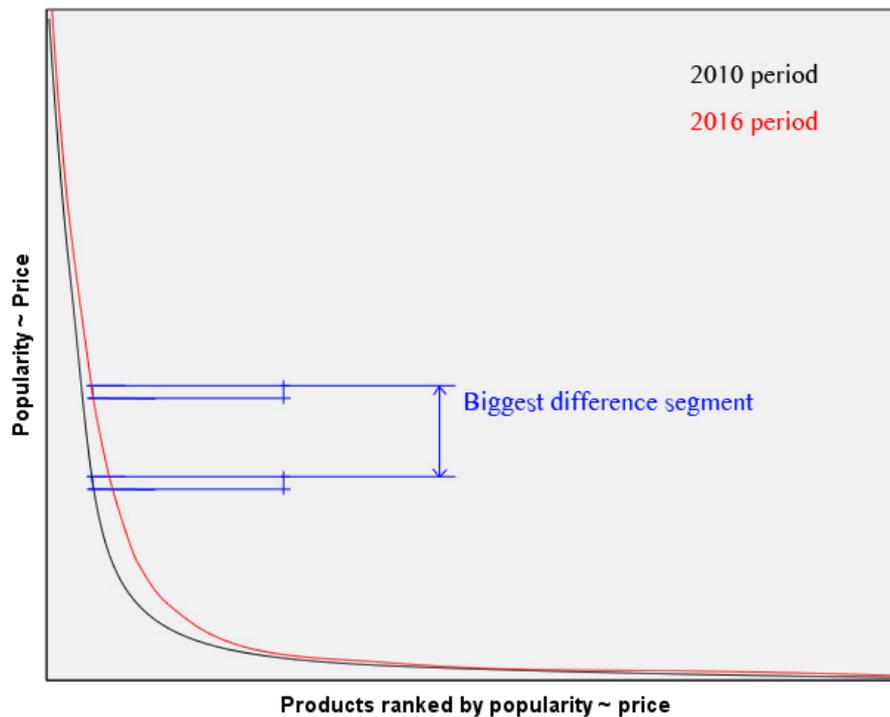
In the real world, however, the situation described above can never occur; therefore, it is necessary to work with a limited supply. Although – from a certain point of view – it continues to grow, as new products get to the secondary market at any time with any further sale in the primary market, these only very rarely, especially in the case of cultural goods, become at the time of its transfer to the secondary market sought and therefore popular.

**Fig. 3: Comparison of the curves of primary and secondary market popularity distribution**



Source: Authors

Results of subsequent correlation analysis revealed the existence of a positive relationship between popularity and final realized price. Therefore, Figure 3 would be proportionally similar, even if we changed the monitored popularity to price. In comparison of prices, which based on prior analysis may be seen as a factor corresponding to a certain degree to popularity, the difference between two time periods clearly shows an increase in favour of the head portion of the curve. That, however, is determined not only by the growth of interest in other products, but rather by the simple fact of unavailability of sought-after products. Basically, it is a long-term trend of substituting unavailable original with as close as possible and the most similar alternative. This confirms the thesis that there is a segment of market products, the popularity and hence the price of which increased between the two periods more than other products. On Figure 4 only the segment with the highest growth in prices and popularity is marked blue, but as can be seen, also the surrounding area has experienced significant growth. It can therefore be assumed that even in the current market there is a part that has the potential for the highest percentage growth rates in the near future. It is therefore that part of the supply that is most suitable for entrepreneurship and investment activities. In all likelihood, these are the closest substitutes for products, the popularity and price of which increased. But the fact remains that in order to be able to define this part in any secondary market exactly, it is absolutely necessary to make an expert analysis of the overall long-term behaviour of the particular market and estimate of the current and future situation.

**Fig. 4: Differences in distribution curves from 2010 and 2016**


Source: Authors

## Conclusion

The research succeeded in the application of the long tail theory on the selected secondary market for products of a cultural nature, in this case, musical instruments. Despite some similarity in the homogeneity of the investigated product category, a difference between the supply of the primary market that is able to adequately reflect the demand and very limited supply of the secondary market supply proved to be critical. While the shape of the long tail curve of the primary market is shaped by a desire for diversity, the demand of the examined secondary market tends to favour relatively narrow product categories. This popularity is reflected in the number of followings and viewings of auctions and in the final price, which, as is confirmed, are interdependent. The unavailability of the originals makes the majority of consumers to substitute this preferred product category by ever more distant substitutes, leading to the formation of long tail distribution. If the limits on supply were lifted, the distribution of sales in secondary markets would look quite different *ceteris paribus*, as the current demand would be directed to the preferred product category. Finally, based on the need for substitutions and results of subsequent investigation of prices in two time periods, the hypothesis was established that there exists a specific area on the secondary markets that has a high entrepreneurial and investment potential.

Therefore, research objectives can be considered to have been met. Certain weakness of the research lies in the fact that the area of study of the secondary market with cultural good was limited by many circumstances and represents only one example of many secondary markets. In this sense, further verification of the obtained results is therefore a matter of future research.

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## TRENDS IN THE AREA OF RESPONSIBILITY AND JUSTICE IN THE ACTIVITIES OF ENTERPRISES: IMPLICATIONS FOR THE V4 COUNTRIES

Wojciech Zysk

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### Abstract

**Purpose:** In the era of globalization, internationalization of enterprises, liberalization of international trade and the increasing division of the world into countries of the rich North and the poor South, the ideas of responsibility and justice in business operations are permanently present. The objectives of this study are as follows: the characteristics of the role of transnational corporations in raising the level of the stratification of society in the rich North and the poor South and an attempt to develop recommendations for the V4 countries as for the development of corporate social responsibility, responsible investment and fair trade.

**Design/methodology/approach:** Empirical analysis was conducted on the data collected from The Fortune Global 500 List 2016, Report on US Sustainable, Responsible and Impact Investing Trends, Fairtrade International Annual Reports, EUROSIF and other sources. Time series analyzes were made to fulfil research aim. The descriptive method was used to develop recommendations for the V4 countries.

**Findings:** This paper presents global and European trends and developments in described area, and lessons learned for the V4 countries. The study covers the period 2004 - 2015, which will allow to analyze the phenomena, both before and during the economic crisis.

**Research/practical implications:** Developing social responsibility, responsible investment and promoting the fair-trade movement in Poland, the Czech Republic, Hungary and Slovakia can contribute to the initiation of changes to the rules governing the world today and starting a new era in fairer trade on the international level.

**Originality/value:** The proposal to increase cooperation of the V4 countries in the area of the three described processes in order to fight against illegal labor migration which is increasingly taking place in the European Union.

**Keywords:** fair trade; international trade; responsible investment; social responsibility; V4 countries

**JEL Codes:** P45, M14, F23, P33

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## **Introduction**

In the era of the globalization of economic activity, the processes of regional integration and trade liberalization, there is an increase in the division of the world into rich countries of the North and the poor South. Under the conditions of growing internationalization, socio-cultural, civilization, demographic, political-integration and economic effects are being observed, including stratification of the population in terms of income earned by individuals. The countries of the Visegrad Group (V4) include the economically developed countries characterized by a high standard of living. Unequal potentials in economy, technology and civilization of the two parts of the world cause imbalance and a relationship of huge disproportions. Criticism of a particular group of companies: international financial institutions, banks and transnational corporations (TNCs), which are organizations considered to be responsible for the current unjust world order, is becoming more and more common. A long-term sustainable development of enterprises, building competitive advantage inscribed in the process of social dialogue and the creation of the socio-economic order are becoming the purpose of the twenty-first century business. The components of the discussed processes include corporate social responsibility, responsible investment and the fair trade movement. The development of cooperation of the V4 countries in the area of the three described processes can result in finding a solution to problems connected with illegal labor migration which is increasingly taking place in the European Union.

## **1 Data and Methods**

In the face of those phenomena, tensions and threats in the activities of the aforementioned entities (especially TNCs), the ideas of accountability and justice are present more and more often, also in Poland, the Czech Republic, Hungary and Slovakia. The components of the described processes include, among others, Corporate Social Responsibility (CSR), Socially Responsible Investment (SRI) and the movement of Fair Trade (Nagyova and Sedliakova, 2014). The article uses statistical data available from annual reports of organizations dealing with the problems described here (EUROSIF, USSIF, Fairtrade International, The Global Sustainable Investment Alliance), as well as data from the report of The Fortune Global 500 Companies List in 2016. The objectives of this study are:

- a) the characteristics of the role of transnational corporations in raising the level of the stratification of society in the rich North and the poor South,

- b) an analysis of the above-mentioned three processes related to responsibility and justice,
- c) an attempt to develop recommendations for the V4 countries in the area of the development of corporate social responsibility, responsible investment and fair trade.

## **2 Results and Discussion**

In this part of the article the impact of transnational corporations on social inequalities in the world, their position relative to selected countries including the V4 countries, and the global and European trends in terms of the idea of justice and accountability will be described. Then the results of the study on the three phenomena described in the article will be presented (Corporate Social Responsibility, Socially Responsible Investment and the movement of Fair Trade), as well as recommendations for the Visegrad Group countries in these processes.

### **2.1 The activities of transnational corporations and social inequality**

In the contemporary economic relations in the world we can see several perspectives of perceiving the model of capitalism, which has become a global phenomenon. The dominance of private property, free enterprise, market deregulation, the development of competition and market mechanism, the liberalization of international trade, the freedom of movement and the role of capital are observed in most economies. As a result of these processes, the internationalization of production processes, distribution and marketing and implementation of the global strategy of international companies are increasing. The activities of major market participants (transnational corporations, banks, financial institutions and investment funds) bring many positive effects, such as the impact on the economic development (the GDP increase), the creation and liberalization of international trade, the growth of competitiveness, the development of techniques and technologies, the creation of jobs, the introduction of modern management methods and the improvement of the quality of goods and services. On the other hand, the above-mentioned groups of companies are in a special way responsible for our interactions with cooperating entities and customers because they have a significant impact on the shape of the reality in which we live. Very often companies operate in accordance with the principle of “greed is good”, which means in practice the multiplication of profit at any cost, guided by short-term benefits, human rights violations, deliberate bad risk assessment or creating fraudulent financial instruments, which in turn leads to deepening social inequalities,

deterioration in the standard of living of societies, environmental devastation and destruction of livelihoods of the population (Zysk, 2015). Table 1 gives a comparison of the amount of revenue of the largest transnational corporations and the GDP of selected countries in the world in 2015, which may show the correlation between the activity of the entities and economic, political, social and ecological modern world.

**Tab. 1: Revenues of selected transnational corporations and GDP of selected countries in 2015 (\$ US billion)**

Ranking	Company/country	Revenues/GDP
1	Sweden	495.62
2	Wal-Mart Stores	482.13
3	<b>Poland</b>	<b>477.07</b>
4	Belgium	455.09
5	Norway	386.58
6	Austria	376.95
7	Egypt	330.78
8	State Grid	329.6
9	South Africa	314.57
10	China National Petroleum	299.27
11	Denmark	295.09
12	Sinopec Group	294.34
13	Singapore	292.74
14	Apple	233.71
15	Finland	231.95
16	Berkshire Hathaway	210.82
17	Greece	194.85
18	McKesson	192.48
19	<b>Czech Republic</b>	<b>185.16</b>
20	Samsung Electronics	177.44
21	Glencore	170.49
22	Bank of China	167.22
23	Daimler	165.80
24	<b>Hungary</b>	<b>121.72</b>
25	<b>Slovakia</b>	<b>87.26</b>

Source: Author's calculations based on <http://pl.tradingeconomics.com/country-list/gdp>, Accessed 21 March 17; The Fortune Global 500 List 2016, <http://fortune.com/global500/>, Accessed 21 March 17.

As it can be seen in the following ranking, the first corporation from the list, Wal-Mart Stores, had only slightly lower revenues than Sweden in that period (US \$ 482.13 billion compared to US \$ 495.62 billion). The revenues of the company were higher than GDP in Poland – US \$ 477.07 billion! It is worth noting that the first 7 corporations in the list above

had higher revenues in 2015 than the amount of GDP in the Czech Republic, and the first 11 – higher than Hungary and Slovakia in the same year. Interestingly, the summed GDPs of these three countries were lower than the corporate revenues ranked first (Wal-Mart Stores – US \$ 482.12 billion compared to the total GDP – US \$ 394.14 billion). The activities of these powerful firms, as demonstrated above, can change the local law or affect the level of the exchange rates of many countries in the world. Thus, it is impossible not to notice the correlation between the business activities of the transnational companies and the living standards of societies, as well as the living conditions of the population.

## **2.2 The ideas of justice and accountability – global and European trends**

Multi-threaded and deepened analyses of the role of companies operating globally occur most often in times of crisis and recession. An example of such a situation was the financial crisis which began in 2008 in the United States (mostly on the mortgage market, the excessive creation of money due to the speculation of corporations and financial institutions) and spread to other countries in the world in the global balance of prejudice to economic relations, which raises the question of further global economic development (Smith and Lenssen, 2009; Crane and Matten, 2016). Some transnational corporations have realized that with an increase in the position on the world market their responsibility for the environment and relations with stakeholders also rises. When analyzing the role of correct relationships and a good image in the area of local, regional and international environment, companies involved in the promotion of such forms of action as Corporate Social Responsibility (CSR), Socially Responsible Investment (SRI) and consider in their dealings the international Fair-Trade movement created by the community. Furthermore, market participants on the demand side have become more aware of the possibilities of corporations and their impact on the environment. They have consciously begun to require economic operators in a fair, transparent and ethical code of conduct – instead, they prefer purchasing goods, using the services and investing in the assets of those companies which take into account the demands discussed in their business strategies.

### **2.2.1 Corporate Social Responsibility (CSR)**

Corporate Social Responsibility can be an appropriate tool to balance the powers and responsibilities of the business sector as a whole in a given society and it refers to business practices involving initiatives which bring benefits to this society. There are a few categories of social responsibility which many of today's businesses are practicing: environmental efforts, philanthropy, ethical labor practices and volunteering. The phenomenon of social responsibility

of business is developing very dynamically. Classic CSR activities (i.e. CSR 1.0) with “good behavior, because it is good” have been replaced with more conscious ones. CSR 2.0 has expanded the concept of responsibility to promoting compliance with legal business jointly with customers and suppliers (Kotler and Lee, 2005). Corporations pay greater attention to their stakeholders' opinions owing to which they can improve production processes and modify the quality of manufactured goods and services.

The latest form of corporate social responsibility is the idea of CSR 3.0. The partnership of “state – the corporation – NGO” as a determinant of this idea gives synergies and aims to solve the problems of inequality in the global scale. Taking into account the rapidly changing market, corporations want to create links with few significant customers who in the future may become an important business partner (Zysk, 2016).

### **Recommendations for the V4 countries in the common CSR policy**

In matters important to the countries of the Visegrad Group, representatives of relevant institutions of these countries organize meetings and establish a common position. An example of such an activity might be “**CEE Innovators Summit**”, an international congress which was held on 27-28 March 2017 in Warsaw. The Prime Ministers of the V4 countries took part in the event. Innovators, startups, NGOs working on innovation in the V4, heads of R&D departments of large companies seeking innovation and representatives of public administration from the region were invited to attend the congress<sup>58</sup>. The special guest of the first part of the congress dedicated to economy was professor Mariana Mazzucato, the author of “The Entrepreneurial State” which explains why the state should be active in economy, what role it should play in the market and how it is all relevant to the innovativeness of economy (Mazzucato, 2013). The same action can be taken by the Visegrad countries (for example with The International Visegrad Fund participation) in matters related to the common CSR policy, especially harmonized requirements concerning the presence of foreign direct investment or Business Process Offshoring centers. Currently, the V4 countries compete with each other to create the conditions for the presence of this type of investment, especially in special economic zones. A harmonized CSR policy would enable better adherence to the principles of corporate responsibility towards stakeholders and the environment, which would be free of unhealthy competition and the reduction of requirements posed to businesses.

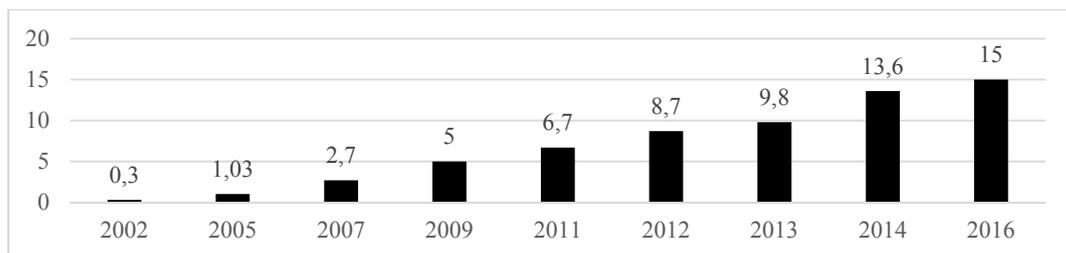
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<sup>58</sup> <http://ceeinnovatorssummit.pl/en/#aboutEvent>, Accessed February 6, 2017.

### 2.2.2 Socially Responsible Investment<sup>59</sup>

Since the 1990s, socially responsible investing is gaining popularity both in Europe, the United States and other countries. According to the data from the European SRI Study 2016 (EUROSIF, 2016) and Report on the US Sustainable, Responsible and Impact Investing Trends 2016 (USSIF, 2016), in the years 2002-2016 the size of the SRI market in Europe grew from 0.3 to 15 trillion EUR, and in the USA in the period 1995-2016 it grew from 0.6 to 8.7 trillion \$ US. Due to The Global Sustainable Investment Alliance (GSIA, 2016), global sustainable investment in 2016 reached 22.89 trillion US dollars, compared to 8.28 trillion US dollars in 2014, an increase of 25 percent. Previously, global sustainable investment assets grew by 61 percent from 2012 to 2014. From the economic point of view, it is essential that the occurrence of the financial crisis of 2008-2009 resulted in an increase in socially responsible investment in Europe. Figure 1 illustrates the European SRI market size before and after the global financial crisis.

**Fig. 1: SRI market size in Europe in the years 2002-2016 (trillion EUR)**



Source: Author's calculations based on „European SRI Study” Reports, years 2003-2016, EUROSIF, <http://www.eurosif.org>, Retrieved February 6, 2017.

SRI market size in the analyzed period increased 50 times.

#### Recommendations for V4 countries in the area of SRI

EUROSIF report “European SRI Study” of 2016 contains only one country of the Visegrad Group countries – Poland. Table 2 presents data on socially responsible investment in Europe, according to the report (selected 13 countries).

<sup>59</sup> The SRI data will include the year 2016 because reports are published every two years.

**Tab. 2: Social Responsible Investments in selected European countries, 2016, (millions EUR)**

<b>Country</b>	<b>millions EUR</b>
Austria	52 184
Belgium	315 900
Denmark	118 376
Finland	67 978
France	3 121 081
Germany	1 786 398
Italy	616 155
Netherlands	991 427
<b>Poland</b>	<b>5 998</b>
Spain	95 334
Sweden	791 739
Switzerland	1 527 582
UK	1 555 328
Europe (13)	11 045 479

Source: as in Figure 1.

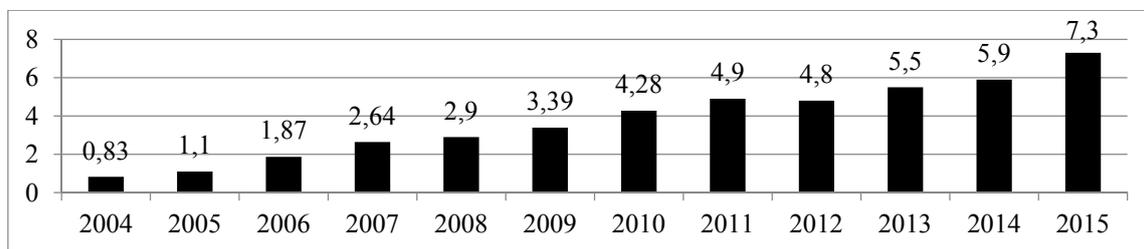
At the end of June 2016, there were 1,138 green, social and ethical funds domiciled in Europe, and Eastern countries present only a few funds (Poland, Hungary) at the moment. To increase the interest in the SRI type of investment in the V4 countries, the governments should consider changes in fiscal policy, together with a system of tax benefits for institutional and individual investors. In addition, public institutions, such as NGOs, religious associations, business associations having an impact on the choices made by consumers should promote ethical investment. Also, it will be important to involve universities in educating students.

### **2.2.3 Fair Trade**

The evolution of the "fair trade" phenomenon has been observed for over half of the century. We can distinguish three basic concepts of Fair Trade which are related to the models of sales of products manufactured by poor South farmers: an alternative movement - opposition to globalization, abandonment of commoditization (commodification), the liberalization of the access to the markets of rich countries - availability for goods from poor countries (Dragusanu, Giovannucci and Nunn, 2014; Moravčíková and Gregová, 2016). Fair Trade products are sold via two complementary distribution channels. The first is the traditional way through an integrated supply chain in which Fair Trade products (handicrafts, food, etc.) are manufactured, imported and distributed by certified Fair Trade organizations which participate in the process (members of the WFTO, EFTA). The other method uses a product certification system in which

products meeting international standards are labeled for easier identification by retail customers. According to a recent report, "*Driving Sales, Deepening Impact Annual Report 2015-2016*", prepared by the Fair Trade International organization (associating several producer networks and 19 national FT organizations) in 2016, customers in 125 developed countries spent more than EUR 7.3 billion on Fair Trade products (35,000 kinds of goods, the most important of these include coffee, cocoa, bananas, flowers, sugar cane, tea, juice or wine). This is an increase by more than 25% compared to 2014. Figure 2 shows the change in sales of FT goods in the world in the years 2004-2015.

**Fig. 2: Fair Trade turnover worldwide in the years 2004-2015 (in billion EUR)**



Source: Author's calculations based on Fairtrade International Annual Reports, years 2003/2004-2013/2014, 2015/2016; <http://www.fairtrade.net/annual-reports.html>, Retrieved February 6, 2017.

The turnover of Fair Trade goods in the world from 2004 to the end of 2015 was more than nine times larger. More than 1.6 million families of small producers and farmers from 74 countries are members of 1,226 producer organizations.

### **Recommendations for the V4 countries in the area of Fair Trade**

Annual reports prepared by the Fair Trade International publish the data of only two V4 countries - the Czech Republic and Slovakia. The Czech Fair Trade Association (*Asociace Pro Fair Trade*) is one of the first national Fairtrade organizations in Eastern Europe – established in 2004<sup>60</sup>. Data on the sales of Fair Trade products in the Czech Republic are in the reports from 2009 (EUR 0.5 million). In 2012, it is already EUR 2.7 million, and in 2013 – EUR 6.4 million, and in 2015 – EUR 8.5 million. In Slovakia in 2015, the sales of Fair Trade products amounted to EUR 1.3 million. To increase sales of Fair Trade products in the V4 countries, the governments should link their economic policies to the threat of the migration of millions of people living in the poorer countries of the South. The tool proposed here is to use co-operation

<sup>60</sup> In Poland, since 2003, Polish Fair Trade Association operates, <http://www.sprawiedliwyhandel.pl>, in Slovakia since 2003: Fairtrade Slovakia, <http://www.fairtrade.sk>; in Hungary “Fair Trade Hungary” on Facebook.

with major cities of the V4 group and to start a trading activity of large cities with local communities ("power of big cities"). If the community of cities, with organizational support of public institutions, will be ready to implement so called Fair Trade 3.0, rich people in the North will prefer buying Fair Trade products or taking millions of refugees. Here are the theoretical assumptions of the Fair Trade 3.0 project: the largest cities in the world are beginning to use their demand side and start direct co-operation with fair trade producers, communal entities are created which would deal directly with producers and importers of goods from economically underdeveloped countries (Zysk, 2016). Urban centers may also create favorable conditions for local cooperatives created by conscious and socially active consumers, e.g. through tax reliefs or organizational aid. Additionally, curricula in schools should accentuate issues of social inequality on the global scale and the role of the Fair Trade movement during parenting classes, lessons of entrepreneurship, ethics, philosophy, economics and foreign trade.

## **Conclusion**

Through the process of political transformation, the countries of the Visegrad Group joined the group of economically developed countries. Developing social responsibility, responsible investment and promoting the Fair Trade movement in Poland, the Czech Republic, Hungary and Slovakia can contribute to the initiation of changes to the rules governing the world today and starting a new era in fairer trade on the international level. Some challenges, such as population migration, efficient trade, the rules of capital flows, the access to markets, the climate change and environmental issues are beyond the scope of any single country to respond effectively. If the V4 countries worked together on the international arena to the extent described in this paper, they could continue to grow dynamically and increase the standard of living and prosperity not only in our part of the world, but also reduce inequalities in society on the global scale. This would be an expression of solidarity with countries at a lower stage of economic growth and might contribute to the fight against illegal labor migration, which is increasingly taking place in the European Union.

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## BEHAVIOR DIMENSIONS: AN ORGANIZATIONAL STUDY

Yalman Zafar Ansari

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### Abstract

**Purpose:** As the IT sector is flourishing in Pakistan with new entrants entering the market, the study focuses on the impact of personal selling, customer relationship management and product quality on consumer behavior in this sector. The results from the current study will provide a guideline for IT firms to get better growth, have an advantage through better customer relationship and have value in their product, so that they can retain and increase customer loyalty. It identifies and argues that if certain behavioural tendencies are organizationally encouraged, they can play a significant role in bringing creative transformation to an organization.

**Design/methodology/approach:** The present study has attempted to produce results and findings that will in turn answer questions regarding the effectiveness of variables known as personal selling, product quality and customer relationship management in the context of online shopping experience in Pakistan. The statistical part of analysis is based on descriptive statistic, correlation and regression analysis of the online shoppers including university students in Rawalpindi and Islamabad. The data was collected from a sample size of 250 respondents out of 270 in January 2017. Convenience sampling technique was used for data collection.

**Findings:** Results indicate that customer perceived value, customer satisfaction and switching cost are major factors which can highly affect the customer loyalty in the nascent online Pakistani market.

**Research/practical implications:** The present study offers a reality check to local IT companies of sophisticated customer base despite the online business being in its very early stage. It gives them a framework of how to effectuate their organizational effectiveness.

**Originality/value:** This paper makes an attempt to reason why technology matters for linking behaviour and creativity together to create new ways of doing business.

**Keywords:** Behaviour Dimensions, Transformation

**JEL Codes:** O31, O32

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## **Introduction**

Many studies have been conducted in the past to explore the relationship between behavior and the factors that might be responsible for influencing it. The affect of behavior is considered extremely significant by online retailers and advertisers in acquiring knowledge about the manipulation of factors responsible for affecting behavior. Mooij (2000), Sammer and Wustenhegun (2005) and Santos & Boote (2004) in their research have stated four main factors responsible for influencing consumer behavior. These factors are mainly known as cultural, social, personal and psychological factors. Due to these determinants consumers tend to develop certain preferences towards products and brands, which according to Boyd (2010) is a buying behavior of the final consumer. Evaluating and understanding the impact of these factors on the buying behavior of consume can help online businesses to develop and implement a strategy tailored toward influencing the preferences of their target market. These factors could include the consumer's culture, subculture, social class, family, personality, and their psychological factors (Friese et al., 2008). In a fierce competition better customer relationship can provide companies an edge over their competitors. Better customer relationship management can increase loyalty (Erickson & Eckrich, 2001). The strength of customer relation also affects price sensitivity (Lee-Kelley, Gilbert, & Mannicom, 2003). As IT sector is flourishing in Pakistan with new entrants entering the market, the study focuses on the impact of personal selling, customer relationship management and product quality on consumer behavior in this sector. The results from the current study will provide a guideline for IT firms to get better growth and have an advantage through better customer relationship and have value in their product, so that they can retain and increase customer loyalty.

**Gap Analysis** The gap analysis of the present study reveals that past research and studies have conducted research on variables that are of subjective nature and are also in the context of different countries leading to different findings due to cultural and social differences present. The research conducted with the prevailing variables used in the present study is conducted on an individual level, meaning that the impact and nature of relationship of only one variable with consumer buying behavior is thoroughly explored. Also, the concerned studies, past and present, have been conducted in the realm of various industries which due to their nature have a tendency to produce different results. The present study contrary to this, has explored the combined impact of all the variables on consumer buying behavior which will provide comparative data and findings regarding their effectiveness. The present study has also chosen the IT sector of Pakistan as the basis for the research, more specifically data collection

has been conducted in the twin cities of Rawalpindi and Islamabad. The present study has attempted to produce results and findings that will in turn answer questions regarding the effectiveness of variables known as personal selling, product quality and customer relationship management. Through the results produced from the present research companies in the IT sector will be able to know the effectiveness of each variable prompting them to develop and implement strategies that will benefit them both financially and marketing wise. Through the results produced from the present research on how those variables interplay with IT companies, we will be able to know the effectiveness of each variable.

## 1. Literature Review

From the research of Consumer Psychology by Boyd (2010), it can be easily understood the significance of consumer behavior and the benefits that the organizations could potentially reap from studying and understanding it. But despite this, the great barrier for companies and organizations is the varying nature of the factors with potential influences. Understanding and studying of these factors would require time and money dedicated to research specifically conducted in the realm surrounding the company. This can be due to the reason that these factors are not in direct control of the company and the fluctuation of these factors from different aspects. **Personal Selling** Organizations interact with customers to increase the level of quality in the product. Sales force is the main foundation of building buyer opinion of seller's dependability it also helps in maintaining long term relation between buyer and seller (Weitz & Bradford, 1999). Sending a sales person to a customer would have a positive impact (Reinartz & Kumar, 2003). People tell each other about things with which they are emotionally connected and organizations can build an emotional attachment with their consumers by positioning their products the way consumers want (Mangold and Faulds, 2009). Adaptive selling is a capable way of rising selling efficacy through sales persons. According to the buyer's needs and belief, the seller's message is communicated to buyer through personal selling (Weitz et al., 1999). Sale effectiveness is closely related to the first time interaction between buyer and the sales person (Weitz, 1981). Sales representatives are very adaptive and effective during interaction with consumers (Weitz, Sujana and Sujana, 1986). **Customer Relationship Management** is a move towards managing and developing association with customers (Chen and Popovich, 2003). Many companies have now realized the importance of customer relationship management to keep a close interaction with customers to gain and sustain competitive advantage (Peppard, 2000). Use of technology plays an important role in managing customer

relations (Jayachandran et al., 2004). Not Just product but the customers create profit so there must be a strong focus on customer relation (Ryals and Knox, 2001). Effective customer relationship management results in better customer satisfaction (Mithas, Krishnan and Fornell, 2005). **Product Quality** Companies signal their quality through warranty. The companies having high quality product offer high warranty in comparison to those who have low quality products (Grossman, 1981). The companies with high debt offer high quality products and demand high value (Vojislave and Sheridan, 1989). Managers should design a method to develop product quality through enhancing communication with customers as it is a source of competitive advantage (Kurt and Hinterhuber, 1998). Consumer satisfaction through product quality is a difficult thing because consumer perception changes over time. Information quality (IQ) consists of product and service quality (Kahn, Strong and Wang, 2002). Quality signals may also be transmitted through brand name, price, warranty etc. (Kirmani and Rao, 2000). A monopolist always sell product of low quality as compared to competition (Mussa and Roses, 1978). **Consumer Behavior** is directly linked to the satisfaction consumers get from the value they pay for a commodity. Consumer behavior constitutes of many things: culture, religion, income etc. People express their religious values through buying (Belk, Wallendorf and Sherry, 1989). Consumer expresses more when there is a decrease in income and the behavior depends on the culture (Mooij, 2000). A label on the product help consumer make buying decision and they become more aware about the product (Sammer and Wustenhegun, 2005). There are two types of expectations that influence buying behavior which are predictive expectation and the peripheral which means the expectation that ranges from ideal standard to the minimum level of expectation (Santos and Boote, 2004). Positive moods brings positive outcome as people may also choose to shop to cheer up negative moods (Gardner, 1995). Online shopping is an important source of shopping and shopping enjoyment is dependent to web skills (Koufaris, 2002). Religion tells us how things should be done and it effects the decision making of a family and it also influences the buying decisions (Delener, 1994). High cost and time needed is a barrier in green consumers purchasing (Young, Hwang, McDonald and Oates, 2010). Consumer may also behave differently from economic theory (Thaler, 1980).

## **2. Tested Hypotheses**

### **2.1 Personal Selling and Consumer Behavior**

Due to lack of trust between organizations and consumers there are few people who shop online (Hoffman, Novak and Peralta, 1999). The influence of seller may reduce the choices of customer and government can also influence through its regulatory policies (Jagdish and Atul, 1995). Selling a new product needs excessive retail support (Woodside and Davenport, 1974). Based on the above discussion, it is hypothesized that: H1: There is a relation between personal selling and consumer behaviour

### **2.2 Product Quality and Consumer Behavior**

If consumer gets satisfied against the value he paid then there will be a positive reaction. Perceived quality and overall satisfaction has a positive relation with purchasing (Tsiotsou, 2006). Consumers want the best quality to be satisfied and perceived quality and safety lead to buy only when the quality as perceived is sufficient for the consumer to be keen to pay the price demanded (Grunert, 2005). Customers have different attitudes when they have information about a product. Internet provides information about products which leads to higher perceived quality level of the consumers which compels producers to raise the level of quality of the product (Ward and Lee, 2000). Consumers behave positively if the product has adequate quality. If the expected quality matches the experienced quality repeat purchases occur (Grunert, Bredahl and Brunsø, 2004). Consumers behave differently to different prices. Price is a key indicator of quality to the consumers (Zeithaml, 1988).

Based on the above discussion, it is hypothesized that: H2: There is a relation between product quality and consumer behaviour

### **2.3 Customer Relationship Management and Consumer Behavior**

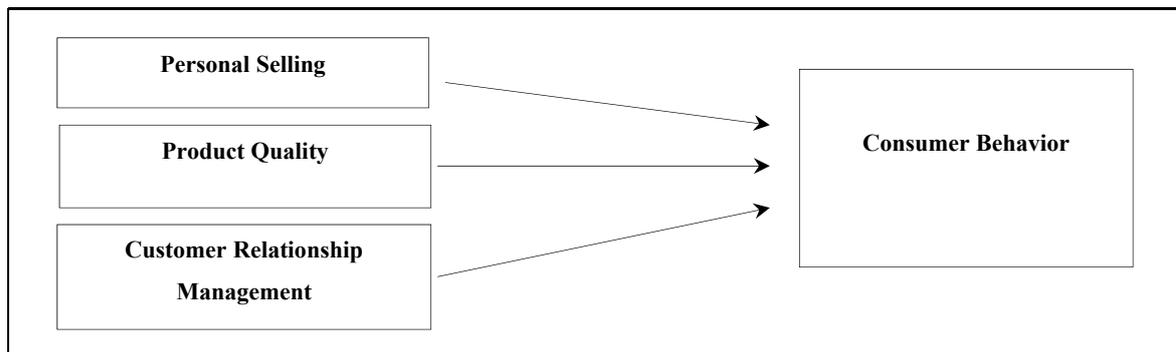
Customer relationship management helps companies to understand consumer behavior (Boulding et al., 2005). Customer relationship management helps organizations to make segment and study attitude of consumers (Zwick and Dholakia, 2004). Manager pay increased attention to align the value of the firm with the consumer to strengthen the relationship (Bell et al., 2002). If managers create committed customers by launching loyalty program they can increase consumer retention (Verhoef, 2003). Customers who chose to complain are presenting organization a chance to prove their capabilities which result in subsequent consumer actions

(Tax, Brown and Chandrashekar, 1998). So, it can be said that, H3: There is a relation between customer relationship management and consumer behaviour

## 2.4 Graphical Representation of Frame Work

The following diagram represents the graphical representation of the theoretical frame work developed for the current study. The left hand side of the diagram displays the independent variables and their impact on the dependent variable shown on the right hand side.

**Fig. 1: Theoretical Framework**



### ***Hypotheses:***

***H1:*** There is a positive relation between personal selling and consumer behavior

***H2:*** There is a positive relation between product quality and consumer behavior

***H3:*** There is a positive relation between customer relationship management and consumer behaviour

## 3 Research Methodology

This study focuses on examining the relationship of personal selling, product quality, customer relationship management and its significant effect on consumer behavior. The framework of the study is based upon previous research studies. This section describes the sampling methods, population, sample size, data collection tools & techniques.

### 3.1 Sampling Method

All of the online shoppers in Rawalpindi/Islamabad are the population of the study. To collect the data for this research the online shoppers including those who are university students of Rawalpindi/Islamabad have been selected. The data was collected from the sample size of 250 online shoppers in Rawalpindi and Islamabad out of 270 respondents approached with a

response rate of 92.59%. Convenience sampling technique was used for data collection because as it is cost effective, time saving, simple and results are obtained on a quick basis.

### 3.2 Data Collection/Analysis Techniques

In this research study primary data was used. Questionnaires were used as an instrument for collecting primary data. These questionnaires were distributed among the online shoppers in Rawalpindi and Islamabad in January 2017. This method is considered to be without any bias. The data was cross-sectional in nature (collected at a single time). Descriptive statistic and means were calculated for the study of variable. For determining the relationship among variables correlation analysis was carried out to show the strength and associations among variable, product quality and consumer variable along with regression analysis. Demographic analysis comprised of questions regarding gender, age, education level, job status. Pilot testing was done to confirm the reliability of the questionnaire through Cronbach's coefficient alpha.

### 3.3 Research Instruments

Questionnaires were used as an instrument to collect the data for the current study. A five point likert scale where; 1 represent strongly disagree, 2 represented disagree, 3 represented neutral, 4 represented agree and 5 represented strongly agree was used to rate the questions in Section II of the questionnaire.

**Tab. 1: Literature Sources for each variable**

Variables	Sources	Items
Personal Selling	Willem Verbeke, Frank Belschak and Richard P. Bagozzi	4 Items
Product quality	John F. Gaski and Michael J. Etzel	6 Items
Customer relationship management	Leo Y.M. Sin, Alan C.B. Tse and Frederick H.K. Yim	4 Items
Consumer behavior	Jacqueline K. Eastman	6 Items

### 3.4 Pilot Reliability Test

A pilot test encompassing a sameple of 60 responses was conducted to test the internal validity of the items. For this purpose, Cronbach's coefficient alphas (Table 2) were calculated using the data of each independent variable and the dependent variable.

**Tab. 2: Reliability Test**

Variable	Cronbach's Alpha
Personal Selling	.898
Product Quality	.931
CRM	.910
Consumer Behavior	.941

The Table 2 reveals that for personal selling Cronbach's Alpha value is 0.898, which suggests an excellent internal consistency for scale, and the total number of items for personal selling value was 6. The value of Cronbach's Alpha for product quality was calculated to be .931 which reveals an excellent level of internal consistency for scale adopted and the total number of items for product quality was 6. The Cronbach's Alpha value for customer relationship management was shown to be .910 which indicates an amazing level of internal consistency and the total number of items was 6. The Cronbach's Alpha value for consumer behavior is 0.941 which further suggests an incredible level of consistency and the total number of items utilized for consumer behavior was 6. The results derived from the reliability and validity test have suggested that all the variables utilized in the present study have shown to be of excellent in the terms of reliability and validity.

### 3.5 Sample Characteristics

Demographic data consisted of 4 questions which are Age, Gender, Level of Education and Monthly Earnings.

**Tab. 3: Frequency Distributions**

S. No.	Demographics	Frequency	Percentage
1	Age		
	20-25	97	38.8
	25-30	59	23.6
	30-35	65	26.0
	35 above	29	11.6

2 Gender

Female	132	52.8
Male	118	47.2

3 Level of Education

Matric Intermediate Bachelor Master or above	57	22.8
	83	33.2
	44	17.6
	66	26.4

4 Earnings

10000-15000	53	21.2
15000-25000	76	30.4
25000-35000	50	20.0
Above 35000	71	28.4

The Table 3 shows that Age is the first demographic factor, and this factor is divided into 4 categories. The Respondents of Age of 20-25 were 97 which was equal to 38.8%, 25-30 were 59 which was equal to 23.6%, 30-35 were 65 which was equal to 26.0%, 35 and above were 29 which was equal to 11.6%. The 2nd demographic factor was regarding Gender. Females respondents were 118 out of 250 (47.2%) and the male respondents were 132 out of 250 (52.8%). The 3rd demographic factor was regarding level of Education. Table show the Respondents of Matriculation degree were 57 out of 250 (22.8%), Intermediate were 83 out of 250 (33.2%), Bachelors degree were 44 out of 250 (17.6%), and Masters degree respondents were 66 out of 250 (26.4%). The 4th demographics were about the Earnings. The earnings were divided into 4 categories from lowest to highest level. The employed respondents of earnings of 10,000-15,000 “ were 53 (21.2%), 15,000-25,000 “ were 76 (30.4%), 25,000-35,000 “ were 50 (20.0%) and 35,000 or above” were 71 (28.4%).

### 3.6 Data Analysis Techniques

The major test conducted to determine the relationship between independent and dependent variables are correlation and regression analysis. Correlation analysis is used to check the strength of association between two variables, whereas regression analysis is used for analyzing the relationship model between dependent and independent variables (Cohen, et al., 2013).

## 4 Results

This study is aimed at analyzing & understanding the impact of personal selling, product quality and customer relationship management on consumer behavior in the context of IT sector of Pakistan. The descriptive statistics analysis / results are shown in the Table 4. The present study has only included mean and standard deviation of descriptive statistics to analyze the results provided from the data collected.

**Tab. 4: Descriptive Statistics**

	Mean	Std. Deviation
Personal Selling	3.9830	0.64741
Product Quality	4.3587	0.49453
Customer Relationship Management	4.3627	0.65861
Consumer Behavior	4.3647	0.46858

Personal selling variable mean value is (3.98) and the standard deviation of the personal selling is (.65). Product quality mean value is (4.35) and the standard deviation value of the product quality is (.49). Customer Relationship Management mean value is (4.36) and the standard deviation of the customer relationship management is (.65). Consumer Behavior mean value is (4.36) and standard deviation of consumer behavior is (.47). The overall standard deviation of the four variables was found minimal. The correlation analysis was conducted in an attempt to define the strength of the association as well as the degree of the suggestion between the variables employed in the current study. The range of the correlation coefficient is -1 to +1, where -1 shows a destructive relation meaning positive change in one variable would result in negative change in other variable associated with it, +1 shows a positive relation indicating a constructive relationship between the variables and 0 specifies no correlation.

**Tab. 5: Correlations**

Variables	Personal Selling	Product Quality	Customer Relationship Management	Consumer Behavior
1 Personal Selling	1	.817**	.952**	.767**
2 Product Quality	.817**	1	.878**	.961**
3 Customer Relationship Management	.952**	.878**	1	.877**
4 Consumer Behavior	.767**	.961**	.877**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The Table 5 shows the results of the correlation test. Strong positive relationship between personal selling and consumer behavior has been indicated, having correlation value,  $r=.767$  which is significant due to P value being less than 0.01. There exists a stronger relationship between product quality and consumer behavior, having correlation value  $r = 0.961$ , which is significant at P value being less than 0.01. Customer relationship management and consumer behavior has also a significant relationship with  $r = 0.877$  at P value being less than 0.01. Examination of the results derived from the correlation test reveals that product quality has the strongest and positive relationship with the variable consumer behavior. This would suggest that positive manipulation of product quality would positively impact the behavior of consumers to a very large degree. Further examination also reveals that customer relationship management had the second strongest correlation with the variable consumer buying behavior and personal selling coming in last but still having a significant relationship. The regression analysis shows the effect of all independent variable and the dependent variables.

**Tab. 6: Coefficients**

Model	Standardized Coefficients Beta	t	Sig.
Personal Selling	.786	28.350	.000
Customer Relationship Management	.724	13.884	.000
Product Quality	.565	13.024	.000

N = 250, F = 1837.468, R Square = .957, Dependent Variable: Consumer Behavior

The table 6 shows the results of model as a whole is statistically significant at  $F=1837.468$  at  $p$  value being less than 0.01. The results point out the value of R Square = .957, that indicates combined effect of all the independent variables which are personal selling, product quality and customer relationship management is responsible for 95.7% variation in the dependent variable known as consumer buying behavior. This shows that the IT sector has 4.3% effect of the other variables which are not included in the study. The table 6 also shows the results of regression. The value of Beta (B) shows the variance caused by independent variable on the dependent variable. The regression results show that product quality has B value = .786 and  $t$  value = 28.350, which is significant at  $p$  value being less than 0.01. The customer relationship management B value is .724 and  $t$  value 13.884, which is significant at  $p$  value being less than 0.01. And the personal selling has B value = .565 and  $t$  value = 13.024, which significant  $p$  value being less than 0.01. The findings from the regression analysis also indicate a similar pattern in regards to the correlation analysis. This shows that the product quality has the most rate of change on the dependent variable consumer buying behavior while on the other hand customer relationship management coming in second and personal selling coming once again in last but still having a significant impact. From the test, it can be deduced that the quality of the product is the most important.

## 5 Discussion

H1: Personal Selling and Consumer Behavior: The results from correlation and regression indicate that there exists a positive and significant relationship between personal selling and consumer behavior which may point to effectiveness of both the above-the-line and below-the-line marketing interactions employed by online-sellers in creating customer confidence and dispelling myths shrouding quality issues when buying online in Rawalpindi and Islamabad. Many other researchers have studied the relationship between personal selling and consumer behavior and further supported the positive link between them. The study of Woodside and Davenport (1974), is a notable example of this. Based on the results from the tests, H1 is accepted. H2: Product Quality and Consumer Behavior: The results mentioned in the present study indicated that there exists a positive relationship between product quality and consumer behavior. Many other researchers who have studied the relationship between product quality and consumer behavior have supported the hypothesis that there exists a positive link between product quality and customer loyalty (Grunert, Bredahl and Brunsø, 2004). H3: Customer Relationship Management and Consumer Behavior: From the findings derived from the

correlation and regression analysis regarding the variables customer relationship management and consumer behavior, it can be deduced that there is positive and significant relationship between customer relationship management and consumer behavior. Besides the current study, many authors and scholars have also provided evidence regarding the positive impact of customer relationship management on consumer behavior. The research of Boulding et al. (2005), can be used as an example of this. In response to the results indicated, the hypothesis H3 is accepted.

Based on the results derived from the analysis of the dependent and independent variables, it can be stated that there is a positive impact from personal selling, product quality and customer relationship management on the dependent variable known as consumer behavior. Previous studies have also claimed that there is indeed a positive link regarding these factors. Thus, all three hypotheses were accepted. From the correlation analysis, it was revealed that product quality had the most strong and positive relationship with the variable consumer behavior. This can be easily explained as a change of positive nature in product quality will yield more positive change in consumer behavior as compared to other variables presented in the study. The regression analysis further revealed that these variables are responsible for at least 95.7% variation in consumer behavior. This can be interpreted as manipulation of these variables will bring about a large change in the variable consumer behavior.

## **Conclusion**

From the results produced from the data analysis, the present study has come to the conclusion that there is indeed a positive relationship between personal selling, product quality, and customer relationship management and consumer behavior. Product quality has been revealed to have the most strong and positive relationship among the rest. Personal selling has the second most strong and positive relationship while customer relationship management coming in last. Based on these observations, it can be deduced that companies should be more focused on product quality. The present study is limited to the IT sector in Pakistan. The data collected for the study was limited to the population of Rawalpindi and Islamabad. The variables were limited to personal selling, product quality and customer relationship management. Based on the results deduced, the present study recommends to the IT companies to primarily focus on the quality of the product to better influence their online customers. While personal selling and customer relationship management should also be included in their strategies in acquiring and retaining more customers, product quality has been determined by the present study to be the

most significant factor influencing consumer buying behavior. Companies that have a limited budget can develop a strategy that emphasizes on improving the quality of their products and services while keeping personal selling and customer relationship management to acceptable standard levels.

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