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INNOVATION MANAGEMENT, ENTREPRENEURSHIP AND SUSTAINABILITY 2020

Proceedings of the 8th International Conference

Proceedings of the 8th International Conference

Innovation Management, Entrepreneurship and Sustainability

May 28 – 29, 2020, Prague

Organized by:
Department of Entrepreneurship
Faculty of Business Administration
University of Economics, Prague

OECONOMICA
Nakladatelství VŠE

Foreword

The 8th International Conference Innovation Management, Entrepreneurship and Sustainability (IMES 2020) 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
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and other partners.

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TEAM MOTIVATION MODEL TO UPGRADE INDUSTRIAL ENTERPRISE KNOWLEDGE MANAGEMENT

Tatiana Aksenova

Abstract

The purpose. The purpose of this article is to convincingly reveal the most influential viewpoints on the team paradigm in the knowledge management (KM) scientific field and to bring them together. Then I argue that the specifics of knowledge-intensive enterprises impose the model, which fundamentally differs from both the transactional approach and the specialists' financial responsibility rule. I propose to build a team motivation model (TMM) by synthesizing both different KM theoretical approaches, and some practical features of knowledge-intensive enterprises.

Design/methodology/approaches. The quantitative method is a bibliometric assessment of the team motivation aspect in the KM theory. The qualitative one is content analysis of the most influential KM publications.

Findings: the bibliometric research on the Web-of-Science platform reveals that the team motivation topic is not duly studied nowadays. Key Knowledge Management articles, which regard a team as an indispensable knowledge creation term, provide non-uniformed approaches. The results of team motivation modeling prove that the tacit-explicit knowledge conversion effectiveness depends not as much on individual specialists' knowledge and skills, but rather on organizational goal dynamics.

Originality/value: Theoretical value is that this article highlights the publications that gave us the team topic as focal in KM scientific field and pulls together the key theoretical KM dissimilarities. The practical novelty is that the proposed model describes not as much distribution of organizational resources integrity, but rather a phenomenon of specialists' self-organization to raise such integrity.

Research implications: the bibliometric analysis clarifies following theoretical paradigms: 1) path-dependent knowledge, which Cohen and Levinthal introduced in 1990; 2) consciousness, which Nonaka (1994) developed in his KM seminal paper.

Key words: bibliometrics, knowledge management, team motivation, organization, specialized resources

JEL Codes: D70, D79, L20, L29

Introduction

The external environment was stable in the classical economics time period. That is why the organizational effectiveness was determined by its ability to economize (for example, avoiding the cost of communication and training). In the new era of knowledge management, external environment turns out to be unstable and unpredictable. That is why Cohen and Levinthal (1990) posed a question about what an organizational structure is to be in order to facilitate specialised knowledge absorption. The enterprise's subunits relate to the original point of entry differently, and they should transfer information across and within each other. Being internally heterogeneous, the enterprise faces the problem to transfer knowledge from high-velocity external environment.

Nonaka (1994) proposed another discussion for managing organizational knowledge-creating processes. His central theme is a continuous dialogue between tacit and explicit knowledge. Explicit knowledge, which is transferable, appears on the organizational level, whereas tacit knowledge, which is a source of enterprise uniqueness and therefor of competitive advantage, is accumulated on the specialists' level. It is necessary to connect the individual and organizational levels in order to transfer tacit knowledge into an explicit form. A way of this connecting is to create a team.

Grant (1996) introduced a new criterion of enterprise effectiveness in order to eliminate the gap between individual and organizational levels. The new awareness of the knowledge-based view is that: consensus decision making is of the high costs because of the communicating tacit knowledge difficulties. Enterprise sustainability should be determined by purposeful investment to the internal environment for knowledge exchange, which is of team character. These investments can be quite significant – the more employees' knowledge is idiosyncratic, the more communication cost is significant. At the same time the organization's competitive advantage becomes more stable.

All of these seminal papers established the team character of organizational knowledge creation, but consider the topic from the different viewpoints. That is why the purpose of this article is to map the team motivation specifics in the KM theory. Then I argue that a model of team motivation (further mentioned as TMM) helps us to develop some fundamental KM determinations.

1. Method

To refine the requirements for team motivation in a knowledge-intensive enterprise, I implement the bibliometric method, which is one of the most contemporary widespread analytic tools (Popov, Aksenova, 2019). Surprisingly, the team motivation topic is not dominant in the articles, which use bibliometrics in the KM theory. For example, Gaviria-Marin et al. (2018) performed a meticulous analysis of the KM theory key words. Among them, there is neither word *team*, no word *motivation*. Similarly, Sanguankaew and Ractham (2019), when establishing the topography and the intellectual structure of the KM theory by means of bibliometrics, do not mention the team topic as an important one.

That is why I propose a bibliometric algorithm to map the team motivation specifics. There are several bibliometric on-line databases, the most important of which are Google Scholar (n.d.), Web-of-Science (Clarivate Analytics, n.d.), further mentioned as WoS, Scopus (Elsevier, n.d.) (Cobo et al., 2011). Google Scholar, though being free-of-charge and therefore presumably more widespread, is the least reliable of them (Amara, 2012). Both WoS and Scopus databases promote high-quality scientific content, citing journals with peer-review procedures only. Since these databases are of different structures, but they are equally credible (Mingers, 2015), I chose one of them, namely WoS.

The KM science WoS mapping algorithm is as follows:

1. Search for the topic "Knowledge management".
2. Refine the search result for the exact topic "Knowledge management" and "team motivation". We should bear in mind to enclose the name of the topics in the quotation marks, when forming the request. Otherwise the search result contains all publications on separate topics such as "knowledge", and "management", and "team", and "motivation".
3. Narrow the topic "Knowledge management" down to the "review" category.
4. Sort the KM reviews out by the citation index and chose among them the most cited one. Here we should operate with the indicator of the number publication citations, presuming that the most cited articles determine the main trends in the knowledge management scientific field.
5. Perform the content analysis of the most cited review to highlight the KM publications, which develop a team topic.
6. Complete the content analysis of the KM publications related to the team motivation topic, which the most authoritative review cited.

2.   Results

2.1   Theoretical findings

The research shows that KM is a rapidly developing theory, the WoS kit for the date 15.01.2020 is of 25,023 publications. At the same time there is the lack of the team motivation studies in the KM field. The exact request "knowledge management" and "team motivation" gave the zero result.

The KM publication array includes 623 reviews, the most authoritative of which is Alavi, Leidner (2001), with the citation index 3482. Its content analysis shows that in connection with the term "team" the most influential publications consider the problem from different viewpoints (Tab. 1).

Tab. 1: The most influential publications consider the team problem

The publication	the WoS citation index	The team motivation importance
Cohen and Levinthal (1990)	12946	Specialists' knowledge evolving is "history- or path-dependent". Assimilating and exploiting knowledge need *prior* knowledge
Nonaka (1994)	6422	There is no the existence of "consciousness" per se. An individual becomes conscious when he pays attention to an object.
Grant (1996)	5925	A specialist can not be controlled from top. At the same time specialists have complementary skills, so they need to be tied together by long-term relationships. On the organizational level science-intensive production requires the integration of each person's knowledge with that of others.

Source: Author's elaboration.

These publications are enlisted in the KM theory core and establish the main KM paradigms. That is why the TMM requirements are as follows.

In the TMM concept an object should mean a goal external to the specialist. To foster the conversion from tacit to explicit knowledge, a certain mediator has to be provided for. This is a team. Only an organization can establish a goal, which on the one hand challenges a specialist, and on the other – is understandable and achievable for him/her. Thus team motivation is to enhance specialists' professional potential through encouraging their mutual assistance and by coordination of their efforts to obtain a future consolidated result. Team motivation must drive specialists' coordination as early as at the stage of organizational goal setting, long before emerging of organizational explicit knowledge.

Organizational bureaucracy turns to be unavoidable (Nonaka, 1994). The informal groups should be related to more formal hierarchical ones. The more this association is effective, the more new knowledge will spread easily within the organization. A TMM, being a reflection of an organizational goal trajectory, clarifies the boundaries of specialists' interaction in the exchange of idiosyncratic tacit knowledge.

Grant (1996) refined the specialist-organization dichotomy. That is why TMM requires team interdependence – group coordination, through bureaucratic and self-organizing meetings.

A team should bridge the organizational and individual levels in order to coordinate knowledge creation. That is why I argue that TMM should prescribe organizational providing specialists with necessary incentives and direction. An incentive system should be a part of resources, which a team is given to achieve the organizational goal. In that way the organization acquires a new quality – it becomes an environment whose boundaries are determined by specialists' ability to communicate on the ground of understanding joint perspective stability and the principles of trust. That confirms the Grant's proposition that a firm is an organization for managing team production rather than an institution for managing transactions (Grant, 1996).

2.2   Practical implication of the team motivation specifics in KM

TMM knowledge conversion has at least two dimensions (Fig. 1).

Fig. 1: The dimensions of knowledge conversion in TMM
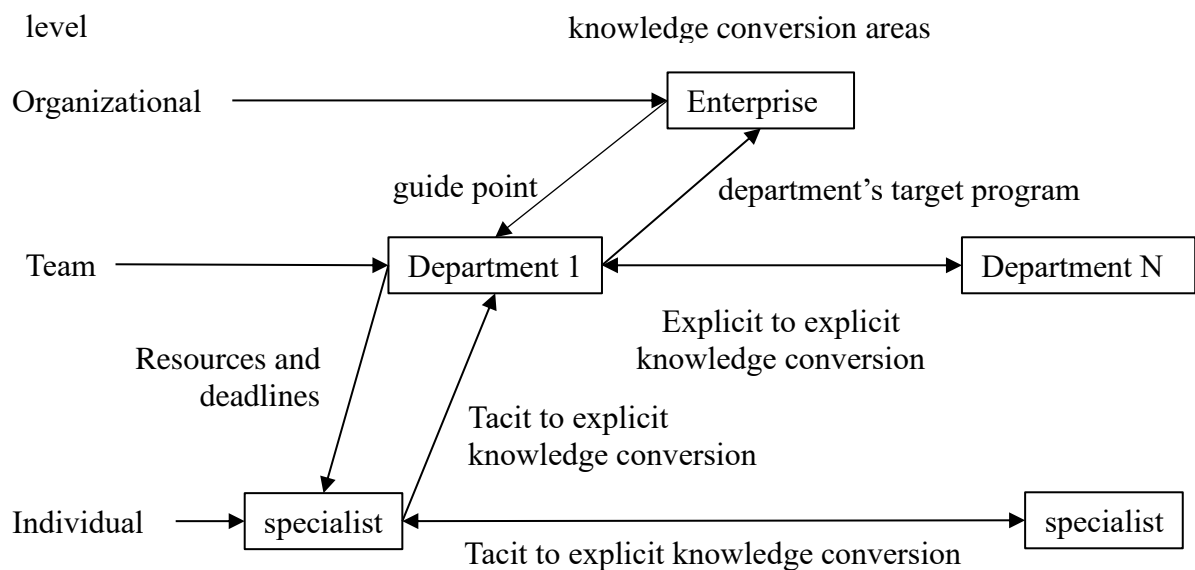
Source: Author's elaboration.

The first dimension is of routine character. The departments' procedural standards and instructions determine the mode of departments' cooperation. This is "explicit to explicit" technological and organizational knowledge conversion. This conversion leads to both the sustainability and flexibility of the internal knowledge communities. The second knowledge conversion dimension is of informal and idiosyncratic character. To achieve new guide points the departments' specialists communicate with no hierarchical regard – there are interdependences between a division-manager and a division-performer. This interaction is chaotic and unpredictable. This internal confusion is restrained by preparing departments' target programs deadline and resources. This is "tacit individual to explicit organizational" knowledge conversion.

From the very beginning, one shouldn't "jump" to judgments whether path-dependent organizational knowledge of an enterprise meets properly modern challenges or not. Recent research suggests that if one uses extant conceptualizations presumptuously, one does not embrace the needs of a wide range of actors (Strauß, Zecher, 2013), which shapes a knowledge-based organization. The team motivation model does not just base on an array of actual information. It "grows inward" the existing control and motivation system to support and gradually renew the patterns of the organizational activity. That is why TMM designing and launching consists of the following procedures:

1) a feasibility study is performed to elicit the ways for production efficiency enhancement;

2) products are to be compared in quality and assortment with similar products of other enterprises (both domestic and foreign), measures for their competitive recovery are to be provided for;

3) improving measures for the labor organization, current calendar planning, and incentive systems are to be prepared;

4) steps for introducing new machinery and increasing efficiency of product output (or service delivery), as well as for using production facilities, are to be developed;

5) current technical-and-economic regulation for equipment operation, work time expenditures; materials, fuel, thermal and electrical energy expenditure is to be updated.

The TMM allows us to measure tacit-explicit conversion effectiveness by means of goal achievement effectiveness. Instead of considering each conversion act separately, we take into account the organizational goal dynamics. The ratio of the enterprise goal numerical value and the resources provided in the departments' target programs determines the effectiveness of the enterprise knowledge management.

3.   Discussion

It is impossible to capture all the TMM capabilities and weaknesses in a short paper. One of the important problems is that several efficiency factors are beyond department influence. Not all of the department's resources are directly connected with the specialists' efforts. For instance, machinery using efficiency does not entirely depend on the department's efforts during a short period. Consequently, it is necessary to specify the nomenclature of the department's controlled expenses. Such a specification presumably is of an organization's idiosyncratic character and cannot be solved from outside.

Conclusions

At first sight, the TMM idea develops the hierarchical paradigm – there is the temptation to search for an exact form of the organizational target dependence *Y(Xi)* and then its numerical maximum by means of mathematical programming methods. But the task should be put differently. Strictly speaking, we didn't consider the model as a function. We should take into account that the result of modeling for complex systems is an open set of solutions (Teece, 2018), which are equally preferred. Subjectivity is inevitable when choosing, and it is always based on particular specialists' knowledge. That is why TMM undoubtedly motivates specialists to choose and stick together different acts to achieve an overall goal.

The heterogeneous character of knowledge-intensive resources determines that each separate division possesses knowledge and expertise that the others do not. That is why a division cannot be a unit of financial responsibility. The number of resources in a separate department target program can justifiably exceed the numerical value of department's guide point. Communication, coordination, and new combinations, but not transactions, influence the decisions of firms. One should bear in mind that any department fulfills not only its program but takes part in other departments' activities. In the case of a knowledge-intensive enterprise, the efficiency criterion is the goal organizational movement as a whole.

Acknowledgements

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OMNI CHANNEL RETAILING: SENSING CHANGE IN A HIGHLY DYNAMIC ENVIRONMENT

Edda Blumenstein – Vassiliki Bamiatzi – Gary Graham

Abstract

Purpose: With the retail industry experiencing both domestic challenges and global competition, retailers are increasingly adopting Omni channel retailing to survive. Omni channel retailing is a customer centric strategy that enables customers to move seamlessly among all available channels across the purchase journey. In this context the main purpose of this research is to investigate how retail brands sense changes in a dynamic marketplace by identifying the specific microfoundations deployed.

Design/methodology/approach: Due to the novelty of the phenomenon examined, the current study adopts an abductive case study approach. Four case studies of Omni channel fashion retailers form the foundations of this research, supported by one system expert case and one cross-industry case. Multiple sources of evidence were collected to address validity, reliability and generalizability. Semi-structured interviews were chosen as primary data source. Overall, twenty-six interviews were conducted between February 2017-2109. Secondary data sources include both internal confidential documents and external public documents.

Findings: The findings indicate that retail brands need eight specific microfoundations for sensing changes in a dynamic industry which can be categorised into two categories; Identify and Interpret. Furthermore, the findings suggest that the sensing capability is either reactive or proactive by nature, depending on the respective retail brand's transformation focus.

Research/practical implications: The retail industry is extremely dynamic and requires retailers and brands to continuously evolve. This research can help retail brand owners, executives, managers and associations to understand how better to sense these changes in order to successfully transform.

Originality/value: The study advances the extant dynamic capabilities literature by contributing to the knowledge of the microfoundations deployed for sensing. It further extends existing knowledge on successful retail transformation in the current dynamic environment.

Keywords: dynamic capabilities, sensing, microfoundations, omni channel, retail transformation

JEL Codes: O3, O32, Z21

Introduction

The retail landscape has become more dynamic than ever before. Omni channel retailing (OCR) emerged as 'the' strategy for retailers who wish to survive in this highly dynamic environment, driven by increasing customer expectations (Rigby, 2011) and changes in purchase behaviour (Verhoef, Kannan, & Inman, 2015). OCR is a customer centric strategy designed to achieve the integration of all available channels so a seamless and personalised customer experience can be achieved.

Adopting OCR requires the development of new retail operations, such as Click and Collect, Ship from Store, Order from Store and Real Time Inventory integration. Saghiri, Wilding, Mena, and Bourlakis (2017) were among the first to propose a distinct framework for developing OCR. Whilst the framework does provide insights as to what OCR consists of - i.e. channel stage, channel type and channel agent - it does not explain how to develop OCR capabilities. Additionally, it has been identified that OCR research lacks theoretical underpinnings (Galipoglu et al. 2018). In the current study, we contribute to bridging this gap in the literature.

We employ Teece's (2007) dynamic capabilities (DCs) framework as the backbone of our framework, while focusing specifically on sensing (and shaping) opportunities and threats. By investigating the activities involved in the process, we identify the specific sensing micro-foundations for continuous retail transformation. The main research question we address here is: *How do retailers develop dynamic sensing capabilities?*

An abductive research approach is adopted to enhance the current theory by empirically investigating the sensing phase and inductively identify the microfoundations involved (Dubois & Gadde, 2002). Deploying a case study design (Cassel & Symon, 1994; Eisenhardt, 1989) we contribute to the understanding of how retailers can develop dynamic sensing capabilities.

The remainder of this paper is organized as follows. In the next section, we discuss Omni channel retailing capabilities and challenges for adoption. In section 2, we discuss related literature on DCs theory and present the DCs framework (Teece, 2007). In section 3 we explain our research method and finally, in section 4 we discuss the findings. We conclude by discussing the research implications for both academia and industry.

1.   Omni channel retailing

There is lack of knowledge in the OCR literature about how retailers sense the need for change. The focus to date has mainly been on identifying capabilities and the challenges

related to OCR transformation. An exception is a framework proposed by Saghiri et al. (2017) which provides insights as to what OCR consist of; channel stage, channel type and channel agent. As noted, researchers have found that adopting OCR requires developing new capabilities (Rigby, 2011).

Several challenges have also been identified. These include strategic challenges such as channel management (Rigby, 2011; Verhoef et al., 2015) and business model transformation (Verhoef et al., 2015), cultural challenges such as resistance to change (Rigby, 2011) and different manager motives (Picot-Coupey, Huré, & Piveteau, 2016), organizational challenges including the need to change the organisational structure and agility (Rigby, 2011). Marketing challenges (Picot-Coupey et al., 2016) have additionally been identified; such as analysing, understanding and using relevant customer data (Rigby, 2011) to offer the right retailing mix (Picot-Coupey et al., 2016) and to provide tailored solutions to customers (Rigby, 2011). Due to the numerous challenges outlined above a staged, trial and error approach for OCR adoption is proposed (Picot-Coupey et al., 2016).

Despite the discussed knowledge about OCR, there is lack of theoretical understanding and detailed empirical knowledge (Saghiri et al., 2017; Verhoef et al., 2015). To date, not research has contributed to the understanding of the DCs needed for OCR transformation. We hence draw inspiration from Teece's (2007) DCs framework to provide novel insights into the capability development practice and the microfoundations involved.

2.   The Dynamic Capabilities Theory

The DCs theory has become the backbone for understanding organisational change in the strategy literature; specifically, how the resource base of an organisation is created, modified or extended as a response to dynamic market changes (Teece, 2007). The theory has been heavily cited since its original publication and continues to be of research interest but calls for deeper empirical understanding (Schoemaker, Heaton, & Teece, 2018) as to date the research has mainly been conceptual (Helfat & Peteraf, 2009). Dubois and Gadde (2002) argue that empirical research is instrumental for the understanding of theory.

The DCs framework consists of three clusters; (1) sensing; to identify new opportunities and/or the need to change, (2) seizing; to grasp identified opportunities and (3) transforming; to successfully implement changes. Each cluster has specific

microfoundations, defined as; *"distinct skills, processes, procedures, organisational structures, decision rules and disciplines"* (Teece, 2007, p. 1319). The focus of this paper is on sensing, specifically to identify the microfoundations for OCR transformation. Hence, for the remainder of this section we focus our discussion on sensing.

Organisations need sensing DCs to respond to dynamic market changes and to create change in the marketplace (Day & Schoemaker, 2016; Teece, 2007). The sensing microfoundations proposed by Teece (2007) are processes to: (1) 'direct R&D and select new technologies', (2) 'exploit supplier and complementor innovation', (3) 'use developments in exogenous science and technology' and (4) 'identify target market segments, changing customer needs and customer innovation'. Day and Schoemaker (2016) identify two sub-sensing DCs and related microfoundations to be peripheral vision and vigilant learning. Peripheral vision entails scoping activities; learning from the past, examining the present and envisioning new futures, and scanning activities; passive or active (hypothesis). Vigilant learning is enabled by fostering a robust market orientation, filtering out the filterers, suppressing biases and triangulating perspectives on a complex issue. Sensing is also found to include both external and internal identification. The external focused activities include customer linked service sensing, service system sensing and technology exploration (Kindström, Kowalkowski, & Sandberg, 2013) monitoring competitors, monitoring the market and technology developments (Niehaves, Plattfaut, & Sarker, 2011). The internal sensing includes internal service sensing (Kindström et al., 2013) and monitoring existing solutions in the own organization (Niehaves et al., 2011).

The existing literature has additionally identified organisational sensing as comprising of several stages and to involve various different activities (Schoemaker et al., 2018) which differ depending on the situation (Day & Schoemaker, 2016). These stages include searching and shaping (Teece, 2007) and information distribution, - interpretation, - utilization and evaluation of outcomes (Day, 1994). Schoemaker et al. (2018) address enabling quick distribution of new knowledge both laterally and vertically. From the existing literature discussed in this section we adopt the notion that organisations need two categories of sensing capabilities; (1) the capability to identify the need to change and (2) the capability to interpret identified opportunities, which are develop through specific microfoundations.

3.   Method

In accordance with the aim of this research to further enrich the DCs theory with empirical findings, as opposed to reinventing already well-established concepts, an abductive approach is adopted for data analysis. The abductive approach enables a combination of deductive (i.e. theory inspired) and inductive (i.e. research inspired) identification to enhance existing theory (Dubois & Gadde, 2002). Qualitative, multiple case-study method was chosen to be able to generalize the findings in relation to theory (Eisenhardt, 1989; Yin, 2014) and as it is considered a more robust method than a single case study by providing better understanding of the phenomenon under investigation (Yin, 2014). Four case studies of Omni channel retailers form the foundation of the research, supported by one system expert case and one cross-industry retailer case. Purposeful sample selection was used to select the case (Yin, 2014) that could provide rich information about the OCR transformation (Eisenhardt, 1989). The sample criteria for the primary cases was threefold; (1) Cases where strategic focus had changed from traditional to OCR, (2) Cases where OCR had successfully been implemented and (3) Cases operating in the fashion retail industry.

Multiple sources of evidence were used to address validity, reliability and generalizability issues related to case study research (Eisenhardt, 1989). Interviews were chosen as a primary source of evidence as they are a key source of data in case studies (Yin, 2014), used to collect in depth empirical data, used to obtain rich data on a less known subject (Eisenhardt, 1989) and used when direct observation opportunity is limited (Cassel & Symon, 1994). The interviews were semi structured to enable the choice of key topics, which ensures the same topics to be discussed in each interview, and to provide participants with the opportunity to add relevant discussion (Cassel & Symon, 1994). All of the interviewees are retail executives and managers who have been involved in the implementation of OCR. The interviews took place between February 2017-2019, both in person and via telephone. All of the interviews were audio recorded and later transcribed. Secondary data sources included both internal confidential documents and external information such as; presentations, meeting memos, annual reports, company statements, news articles, website and visits to physical stores. Table 1 summarizes the overall data collected.

The data was analysed using template analysis which was considered appropriate as it combines both a structured and flexible analytical process and is frequently used to

interpret interview data in business and management organizational research. Using this technique required the development of a coding template by applying both 'bottom up' as well as 'top down' analytical approaches (Cassel & Symon, 1994). Overall, the analytical procedure had four stages. Firstly, Case 1 was used to develop the initial coding template which further developed with step by step coding of the following cases. Second, each interview was first coded using a priory themes deducted from the DCs theory; sensing, seizing and transforming, to enable fitting the data to the theory (Eisenhardt, 1989). Third, the text in each theme was then coded to inductively to identify codes, sub-codes and categories for each case study and to develop a coding hierarchy. The coding process stopped when the text in each theme had been coded. Finally, a cross-case comparison was conducted to identify similarities and differences between the cases (Eisenhardt, 1989).

Thematic template analysis is an iterative process (Cassel & Symon, 1994). Hence, after coding all the primary cases, the coding hierarchy (all of the codes, sub-codes, categories and quotes) went through another round of holistic analysis. This iterative analytical process enabled to expand our understanding of both the DCs theory and the OCR phenomenon (Dubois & Gadde, 2002). The process stopped when no changes, new codes, new sub-codes or categories were identified. The coding template in NVivo was updated regularly in accordance.

Tab. 1: Data collection

Interviews	Cases	Interview data	Secondary data
26 interviews	4 x Primary cases 1 x System Expert Case 1 x Cross Industry Case	Interviews: 1.314 minutes = 22 hours Transcripts: 316 pages = 163.079 words	Internal confidential presentations Published data: Annual reports, press releases, news articles, website, stores, industry reports

4.   Results

This study found that retailers pursuing OCR deploy sensing in both categories of identify and interpret. Six microfoundations are found to identify and two microfoundations are found to interpret, both entail internal and external sensing. Figure 1 presents the sensing framework. In addition to the microfoundations identified, this study also reveals that the sensing activities are either reactive or proactive by nature. Each microfoundation will now be discussed in turn.

Fig. 1: The Sensing Framework
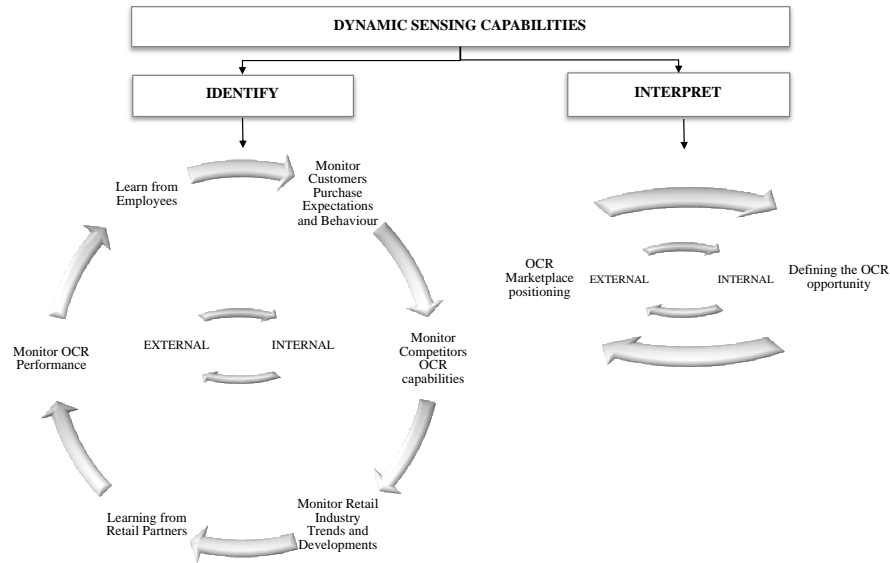
4.1 Monitoring customer purchase expectations and behaviour

Customers are a known source for sensing customer related changes (Teece, 2007). Aspiring Omni channel retailers need to actively listen to their customers by continuously and systematically collect, analyse and distribute customer feedback. Developing a single customer view, by seamlessly integrating all the customer information sources, enables retailers to analyse customers purchase journey behaviour and provide personalised communication. Furthermore, retailers need to be aware that customers may have different expectations towards different types and sizes of retailers and can be impacted by retail experiences in other industries. These findings are in agreement with recent theoretical empirical evidence which identifies customer linked service sensing as a microfoundation of service innovation (Kindström et al., 2013). Additionally, the results are consistent with previous research supporting sensing processes consisting of outside-in sensing (Day, 1994), examining the past and the present, and promoting a market-oriented mindset (Day & Schoemaker, 2016).

4.2 Monitoring competitors OCR capabilities

Retailers seeking to remain competitive in the marketplace need to monitor more than just customers. Successful retailers monitor competitors existing OCR propositions on each step of the customer journey, which includes both direct and indirect competition benchmarking, cross industry monitoring and envisioning competitors' future evolution. Retailers who are seeking to lead and transform the industry additionally need to take a broader look and

identify new innovations that have the potential to disrupt customer journey experiences. These findings add competition linked sensing to the microfoundations identified for sensing service innovation (Kindström et al., 2013). As with customer sensing, these results are consistent with previous research supporting sensing processes consisting of outside-in sensing (Day, 1994), examining the present and promoting a market-oriented mindset, but additionally consisting of envisioning new futures (Day & Schoemaker, 2016) by speculating how competitors will continue to evolve (Day, 1994) and by monitoring competitors business process change (Niehaves et al., 2011).

4.3 Monitoring retail industry trends and developments

Sensing is argued to require processes to exploit supplier innovation (Teece, 2007). In retail this activity focuses on learning from suppliers in order to keep up to date with new solutions and systems, irrespective of exploiting them. Hence, retailers seeking to remain competitive in the marketplace continuously need to monitor new OCR developments in the market, both from external sources as well as company own sources; such as by attending industry events, learning from suppliers and vendors, listen to word of mouth and reading industry papers. Retailers seeking to lead and transform the industry, additionally need to monitor OCR developments in different markets and across industries, operate innovation labs and predict future evolution. These results support previous evidence in the IT literature which finds monitoring the market and its latest technological developments for sensing (Niehaves et al., 2011). However, the above findings do not identify the monitoring of the technology itself as a focus, instead identifying innovations to improve customer experiences and disruptive retail innovation, which can include new technology. Additionally, these results are in general agreement with peripheral vision processes of examining the present and envisioning new futures (Day & Schoemaker, 2016).

4.4 Learning from retail partners

Businesses can exploit complementor innovation to sense changes in dynamic industries (Teece, 2007). We find that identifying retail opportunities calls for close collaboration and networking between retailers. Retailers seeking to remain competitive in the marketplace need to network with other retailers, internally and externally, and learn from their experiences. On the other hand, retailers seeking to lead and transform the industry additionally need to look at co-developing opportunities with key retail partners. These findings support outside-in sensing processes (Day, 1994).

4.5 Monitoring OCR performance

External sources are not the only approach for sensing retail changes and opportunities. Retailers need to monitor own performance of implemented OCR services to identify the need to change and update existing processes and operations to better meet customer expectations and to match the competition. This finding supports previous evidence of internal sensing microfoundations (Kindström et al., 2013). Additionally, these results find that retailers need to continuously learn from actual implementation, i.e. learning by doing.

4.6 Learning from employees

Another source of internal sensing are employees. Our findings show that retailers seeking to identify new and innovative retailing ideas also need to learn from existing employee's knowledge, such as prior experiences and best practice and be open to their new and innovative ideas. These findings further support previous evidence of internal sensing microfoundations (Kindström et al., 2013) and are consistent with previous research on information distribution for sensing (Day, 1994).

4.7 Defining the OCR opportunity

In addition to identifying retail opportunities, interpreting the new knowledge is highlighted. Retailers need to clearly interpret their meaning of OCR to ensure mutual understanding in the organisation. It requires changing the focus from being product centric to become customer centric, specifically to provide customers with a seamless experience as well as defining the overall OCR vision and strategy. These findings are consistent with previous research supporting market sensing interpretation (Day, 1994) as well as recent empirical research in the DCs literature supporting sensing processes of fostering a robust market orientation to interpret the weak signals that have been identified (Day & Schoemaker, 2016). These findings specifically find market orientation to be customer centric to interpret identified signals.

4.8 OCR marketplace positioning

Another step of interpreting new opportunities entails marketplace positioning. Retailers need to clearly define where they position themselves in terms of OCR which provides direction in relation to which OCR opportunities and/or threats to respond to; as a follower focusing on catching up with OCR to remain competitive or as a leader focusing on leading and elevating the industry by developing and introducing new

innovative OCR experiences to customers. We believe these findings to be novel microfoundations for sensing.

4.9 Reactive and Proactive Sensing

Surprising findings of this study reveal that the sensing activities are either reactive or proactive by nature. We define reactive as responding to industry changes that have already taken place and proactive as creating changes in the industry. Accordingly, Case 1 and 2 deploy reactive sensing to respond to existing market conditions focusing primarily on adopting OCR to remain competitive; by meeting customer needs and keeping up with the competition. Whereas Case 3 and 4 deploy both reactive and proactive sensing to disrupt and lead changes in the retail industry. These are novel findings as prior studies have identified sensing activities to be either passive scanning to reinforce beliefs or active hypothesis driven scanning (Day & Schoemaker, 2016).

Conclusion

The main purpose of our study was to identify the microfoundations for sensing in a dynamic retail industry and by doing so advancing the DCs theory with an empirical case. Overall, the study has two main contributions. First, our study extends existing literature on sensing DCs by empirically investigating its application in the retail industry whereas existing studies have mainly focused on product and service innovations (Kindström et al., 2013). By identifying the microfoundations that retail brands must develop to sense changes in the marketplace we contribute to the knowledge of DCs by providing empirical evidence of DCs in practice. As such, the two sensing categories of identifying and interpreting are confirmed. These findings support existing literature which has identified organisational sensing activities as comprising of several phases (Teece, 2007). We additionally identify specific microfoundations for each category to entail both internal and external sensing.

We specifically identify six microfoundations for successful identification in the retail industry which included both external and internal sensing (Kindström et al., 2013; Niehaves et al., 2011). Whereas Case 1 and 2 deployed sensing DCs to catch up with the industry changes, Case 3 and 4 additionally deployed sensing to identify opportunities to transform the industry (Day & Schoemaker, 2016; Teece, 2007). We find that sensing entails different activities based on the retail brand's focus of catching up versus creating market change. The internal and external activities for catching up focused on identifying

the need to change (Helfat & Peteraf, 2009) by learning from the present whereas creating change additionally entails envisioning new futures (Day & Schoemaker, 2016). As highlighted, sensing also includes interpreting new information (Teece, 2007) knowledge which we further enrich by identifying the specific microfoundations involved in this step to be; (1) defining the opportunity and (2) marketplace positioning. We argue that the prior is internally focused as the latter is externally focused.

The second contribution of our study is extending existing knowledge of retail transformation research. We do so by identifying the specific microfoundations retailers need to have in place to sense changes in the industry which lays the foundation for successful transformation. In doing so, we have filled a research gap in the retailing literature, which to date has had limited knowledge of the development of DCs for successful retail transformation.

This study also reveals novel surprising findings. Surprising findings of this study demonstrate that sensing in the retail industry is either reactive or proactive by nature as opposed to passive scanning to reinforce beliefs or active hypothesis driven scanning (Day & Schoemaker, 2016).

Managerial implications, further research and limitations

Although the microfoundations reported in this report are identified in all of the cases, we do not claim that our findings provide a complete list of all possible microfoundations for sensing in the retail industry. However, the microfoundations are argued to be the foundation for retailers and retail brands wishing to survive in a dynamic industry. Hence, these findings provide retail managers insights into the specific foundations required for sensing dynamic market changes; i.e. the first step required to enable organisational change as a response to dynamic market changes (Teece, 2007).

Despite these findings, our research also has limitations. Although the research method entailed multiple, in-depth case studies, the data was collected from large retailers and retail brands. Future research should investigate sensing microfoundations among SME retailers and brands to compare with the findings from the large retail brands in this study. Additionally, as the primary cases all operate in the fashion retail industry, future research should include different retail industries to enhance the understanding of sensing changes in the retail environment. The proposed future research would therefore address generalization issues, between industries and firm size, of the presented study.

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CLUSTER ANALYSIS IN VERIFICATION OF THE ORGANIZATIONAL STRUCTURE EVOLUTION MODEL OF AUTOMOTIVE ENTERPRISES

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Abstract

Purpose: The study verifies the theoretical model of the organizational structure evolution elaborated by the authors, which is based on the hypothesis that two types of production structures – sequential and parallel, dialectically replace each other, changing qualitatively in the process of growth and development.

Design/methodology/approach: The industrial production sector is chosen as an object of analysis for determining the organizational structure largely by the formation of integrated structures. As a research method, a cluster analysis is applied. To conduct the study, a sample of 326 enterprises engaged in the production of vehicles located in the Czech Republic is selected. The source of data is the Albertina Gold Edition database.

Findings: The organizational structure evolution model of industrial enterprises is generally confirmed. The theoretically determined pattern on the intensive growth during the transition from a parallel to a sequential production structure, and the extensive growth in the transition from a sequential production structure to parallel is also partially confirmed.

Research/practical implications: The study results have overall confirmed the hypothesis put forward and showed partial alignment with the proposed theoretical model of the organizational structure evolution of industrial enterprises.

Originality/value: Using the proposed model of the organizational structure evolution enables owners and management to rationally develop industrial enterprises in the long term, as well as give an additional impetus to the development of scientifically based models of organizational structures.

Keywords: organizational development, statistical research methods, cluster analysis in industrial production, development of automotive enterprises

JEL Codes: D23, L22, M21

Introduction

Studies to identify patterns of organizational development based on the analysis of quantitative indicators of the economic activity of commercial organizations were carried out by a number of researchers (Hanks et al., 1993, Shirokova, 2008). In these studies, an attempt was made to empirically identify the levels of development of organizations in accordance with the assignment to a particular cluster and then propose a model of their organizational development. Cluster analysis was carried out using Ward's method. The indicated researchers predominantly selected structural variables for conducting cluster analysis, obtaining indicator values by conducting a survey of management of the organizations under study. However, the research results, according to the researchers themselves, did not allow to come to certain conclusions about the sequence of development stages of organizations assigned to different clusters. In part, this can be explained by the relatively small number of organizations in the samples (in different studies it did not exceed 160 companies) and the inclusion of various economy sectors in the sample.

In contrast to the aforementioned studies, the authors have previously developed a theoretical model for the evolution of the organizational structure of industrial enterprises followed by its verification. Within the framework of this model, typification of production structures is proposed, involving the allocation of two basic types – sequential and parallel. Also, the authors initially denied receiving initial information by questioning the management of the studied organizations in favor of using information from a database of commercial organizations of various economy sectors. This made it possible to avoid the ambiguous interpretation of the information obtained from questionnaires, and significantly (at times) increase the sample size. As will be discussed below, the results of studies conducted by the authors showed the need to use a sufficiently large sample of organizations in the selected industry in order to obtain correct results.

A study of Su et al. (2019) examines the relationship of organizational structure in the context of the mechanistic-organic continuum with managerial innovation. The findings suggest that the relationship between the organic structure and managerial innovation is positive and mediated by cross-functional integration. As previously mentioned, the defining characteristics of the organizational structure, the authors chose the typification of production structures, including sequential and parallel structures. This

approach was previously tested by the authors in the analysis of both manufacturing enterprises and service sector organizations (Denisov, 2008). The hypothesis put forward suggests that there are two basic types of production structures – sequential and parallel. The sequential type of production structure implies a production system in the form of a sequential transformation of the input materials / components into a final product. The parallel type of production structure implies a production system in the form of two or more streams of conversion of input (raw materials / components) into the final product. The parallel type of production structure, generally, involves the creation of separate divisions, each having a duplicating production system. With the development of companies, the two basic types of production structures – sequential and parallel, replace each other. That is, the authors proceed from a dialectical approach to the development of commercial organizations, stating that the development of commercial organizations can be represented in the form of spiral development, when sequential production structures are transformed into parallel ones as organizations develop and, then, at a new stage of development, transformation again starts from parallel production structures to sequential ones.

The main approach proposed by the authors for validating the hypothesis is to classify an array of commercial organizations of the selected industry using cluster analysis and undertake the subsequent refinement of results (Bobkov et al., 2017; 2018; 2019). Cluster analysis is quite widely represented in the analysis of activities and identification of typological characteristics of industrial enterprises in various fields (Boeva et al., 2017). This method allows us to identify the specifics and performance characteristics of various groups of enterprises, the parameters of their economic stability.

It should also be noted that in the process of conducting cluster analysis, the authors used variables characterizing both the structure of the organization and the results organization's economic activity. Prior research held by the authors on retail and education sectors of the Czech Republic's economy not only made it possible to unequivocally prove the hypothesis on sequential and parallel production structures, but also compare them with the theoretical model of the organizational structure evolution in the process of development (Bobkov et al., 2017; 2018; 2019). The developed model, although having some industry specifics, is generally universal. In addition, the studies revealed one more regularity: during the transition from a parallel production structure to

a sequential one, the growth of an organization is intense, and when moving from a sequential production structure to a parallel one, the growth is extensive.

As mentioned above, previous studies related to the scope of services. In the framework of this study, the authors strive to identify the patterns of organizational development of industrial enterprises, which, in contrast to the service sector, have particular characteristics, as well as to prove the universal nature of the proposed model of the organizational structure evolution. In today's uncertain and dynamic market environment, the need for organizational structures capable of responding to the continuous improvement of organizational processes is more acute than ever (Dvouletý, 2019; Rico & Cabrer-Borrás, 2019). Zhang et al. (2018) are developing a systematic framework by comparing their results with industry data from the global automotive industry.

When constructing the theoretical model, the authors proceeded from the assumption that in the process of developing commercial organizations and improving their operational activities in a certain period of time, the boundary of existing technological limitations is reached, which determines the limit for productivity growth. This understanding relies heavily on the concept of the S-curve (Foster, 1986; Christensen, 2013) and the model of sustainable enterprise growth (Rappaport, 1986; Van Horne, 2008). After reaching the growth frontier, the company management needs to transform the organizational structure in a certain way in order to achieve further growth.

Depending on the current development level of an enterprise, such transformations can be carried out in one of two ways. If a company forms a technologically consistent system of production, there is a duplication of core business and a transition to a parallel organizational structure or, in other words, to a horizontally integrated structure. If a company is already duplicating its core business within a horizontally integrated structure, further development is carried out by extending the value chain within one larger structure, i.e. the formation of a vertically integrated structure. The role of both vertical and horizontal structures is being investigated (Lewis & Clark, 2019) with particular interest in the relationship between organizational and sub-organizational perspectives.

The organizational characteristics of each level of enterprise development within the framework of the theoretical model of the organizational structure evolution of industrial enterprises developed by the authors are presented in Table 1.

Tab. 1: The organizational structure development model of industrial enterprises

Development level	Type of industrial enterprise	Type of organizational structure
1	small manufacturing plant / workshop	sequential
2	network of small manufacturing enterprises / workshops	parallel
3	industrial enterprise	sequential
4	industrial enterprise network	parallel
5	vertically integrated company	sequential
6*	horizontally integrated company	parallel
7*	transnational corporation	sequential

* Not analyzed in this article.

Source: Own work based on: (Denisov, 2008).

1. Materials and methods

To conduct the study a total of 326 automotive manufacturing enterprises of the Czech Republic were selected based on the results of their economic activity for the 2016 calendar year (from January 1, 2016 to December 31, 2016). The data was obtained from the Albertina Gold Edition database (Bisnode, 2018).

The choice of the year was due to the completeness of the information data series across all indicator values across the sample. Financial indicators were calculated in the source currency – Czech crowns (CZK).

To confirm the proposed theoretical model of the organizational structure evolution advanced, we used cluster analysis, which is widely applied for analyzing organizational structure (Boeva et al., 2017), conducted using the IBM SPSS program.

During the cluster analysis, two groups of variables were selected that characterize both the structure of the enterprise (first group) and the results of its business activities (second group):

The first group of indicators:

- ✓ number of company units;
- ✓ average number of employees in total (people);
- ✓ average number of employees per unit (people);

The second group of indicators:

- ✓ value of total assets (thousand CZK);
- ✓ revenue per one unit (thousand CZK);
- ✓ depreciation amount (thousand CZK);
- ✓ labor productivity index (thousand CZK / month).

The calculation of Pearson's correlation coefficient (PCC) matrix is presented in Table 2.

Tab. 2: Pearson's correlation coefficient matrix

	Number of company units	Average number of employees in total	Average number of employees per unit	Value of total assets	Revenue per one unit	Depreciation amount	Labor productivity index
Number of company units	1	0.448**	0.025	0.281**	0.023	0.286**	-0.032
Average number of employees in total	0.448**	1	0.663**	0.756**	0.414**	0.732**	0.246**
Average number of employees per unit	0.025	0.663**	1	0.347**	0.646**	0.248**	0.418**
Value of total assets	0.281**	0.756**	0.347**	1	0.499**	0.982**	0.559**
Revenue per one unit	0.023	0.414**	0.646**	0.499**	1	0.338**	0.637**
Depreciation amount	0.286**	0.732**	0.248**	0.982**	0.338**	1	0.476**
Labor productivity index	-0.032	0.246**	0.418**	0.559**	0.637**	0.476**	1

** The correlation is significant at the level of 0.01 (2 sides).
Source: Own calculations.

Since the signs are equally informative and significant for further analysis, the distance between the objects was calculated using the simple Euclidean distance formula:

$$\rho_E(x_i, x_j) = \sqrt{\sum_{e=1}^{k}(x_{ie} - x_{je})^2}$$, with: x_{ie}, x_{je} – value of e component at i (j) object ($e=1,2,…, k$), ($i\,j= 1,2,…n$).

Cluster analysis was carried out using the Ward's method, which allows us to split the population into a sufficient number of clusters corresponding to the economic nature of the phenomena studied. Due to the different units of measurement, the studied parameters were preliminarily standardized. Objects with data gaps and objects with anomalously high value added and total assets compared to other organizations were

excluded from the analysis. Accordingly, cluster analysis was carried out on a sample of 326 enterprises producing vehicles.

The hypothesis on dispersion inequality within and between clusters is rejected for all variables at 5 and 320 degrees of freedom. The p-value is the probability of error when adopting the hypothesis of dispersion inequality is extremely low, not more than 0.001 (the F-criterion is significant for all variables at a level of at least 0.01). This suggests that the hypothesis of dispersion inequality is accepted and, accordingly, clusters are formed correctly.

2. Research results

The cluster analysis resulted in a breakdown of 326 automotive manufacturing enterprises into 5 clusters. The distribution of the analyzed organizations by clusters is shown in Fig. 1.

Fig. 1: Cluster distribution of automotive companies
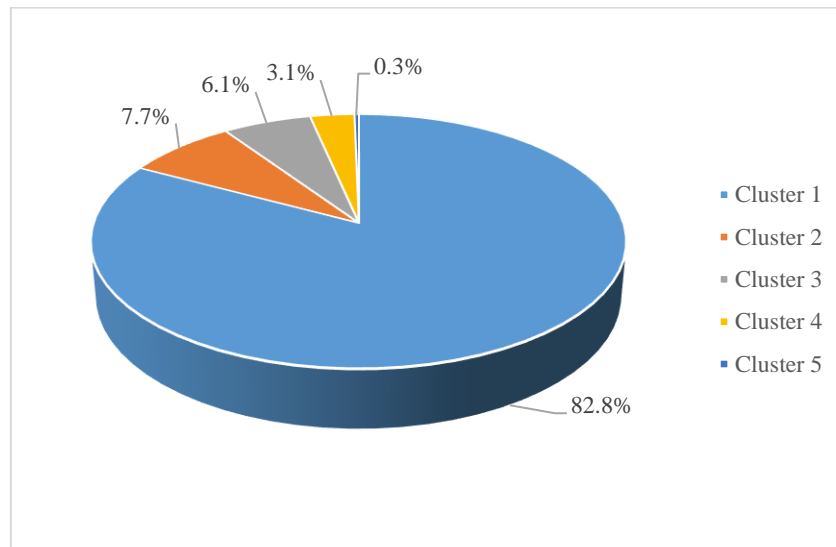
Source: Own calculations.

The results of the cluster analysis of automotive companies are presented in Table 3.

Tab. 3: Average values of variables in clusters, sorted by the value of total assets

Variable title	Cluster 1 N=270	Cluster 4 N=10	Cluster 2 N=25	Cluster 3 N=20	Cluster 5 N=1
Number of company units	1.6	1.5	1.2	5.1	1.0
Average number of employees in total (people)	186.4	330.3	1 030.0	2 112.5	2 750.0

Average number of employees per unit (people)	116.8	305.6	875.0	566.2	2 750.0
Value of total assets (thousand CZK)	344862.5	2522517.4	2 763675.0	5754062.9	68830948.0
Revenue per one unit (thousand CZK)	425.3	9 113.2	4 848.4	3 775.8	145 003.0
Depreciation amount (thousand CZK)	19 068.6	64 934.5	133 562.6	407 778.0	2 619 816.0
Labor productivity index (thousand CZK / month)	196.9	2 408.8	381.2	444.5	4 327.0

Source: Own calculations.

Estimating the obtained distribution results for clusters after sorting by the total assets indicator (see Table 3) one can see a sequential increase and decrease in the values of the number of company units. At the same time, the growth of total assets is accompanied by an increase in the average number of employees and depreciation. Most clearly, the trend of increasing and decreasing values of the number of company units can be traced in clusters 2, 3 and 5. While in cluster 2, which includes 25 industrial enterprises, the average number of units is 1.2, in the next cluster (cluster 3 – 20 enterprises), the average value of the number of units increased 5.1; in cluster 5 (1 enterprise), the value of the number of units decreased to 1.

It is worth noting an interesting pattern identified by the authors in previous studies (Bobkov et al., 2019), that when moving from a parallel production structure to a sequential, the growth of the organization is intense, and when moving from a sequential production structure to a parallel, the growth is extensive character. As can be seen from Table 3, when moving from a sequential production structure to a parallel one (clusters 2 and 3), the growth of total assets is almost twice faster than the growth of the labor productivity index (total assets increased 2.08 times, and the labor productivity index – 1.16 times). In the transition from a parallel production structure to a sequential one, the growth of the labor productivity index slightly lags behind the growth of total assets (total assets increased by 11.96 times, and the labor productivity index by 9.73 times).

Analysis of enterprises located in clusters 1 and 4 requires additional research. Although the tendency to reduce the number of units from cluster 1 to cluster 2 is clearly visible, questions arise when comparing the results with the theoretical model for the

organizational structure development. As can be seen from the Table 4, a comparison of the results of cluster analysis with the proposed theoretical model for the organizational structure development of industrial enterprises shows only a partial coincidence of the results obtained (for clusters 2, 3 and 5).

Tab. 4: Comparison of the research results with a theoretical model for the organizational structure development of industrial enterprises

Cluster number	Number of companies	Type of industrial enterprise	Type of organizational structure
1	280	requires clarification	requires clarification
4			
2	25	industrial enterprise	sequential
3	20	industrial enterprise network	parallel
5	1	vertically integrated company	sequential

Source: Own calculations.

As mentioned above, to analyze the enterprises included in clusters 1 and 4, their comparison with the proposed theoretical model for the organizational structure development of industrial enterprises requires additional research. Further investigation is primarily focused on structural variables by benchmarking with the hypothesis put forward. For structural variables, cluster boundaries (minimum and maximum values of variables) and median values were identified (Table 5).

Tab. 5: Minimum and maximum values of individual variables in clusters

	Number of company units			Average number of employees in total, people			Average number of employees per unit, people		
	min	max	median	min	max	median	min	max	median
Cluster 1 N=270	1	7	1	3	750	75	2	750	75
Cluster 4 N=10	1	5	1	3	750	375	3	750	281.3
Cluster 2 N=25	1	2	1	750	2250	750	625	1750	750
Cluster 3 N=20	2	20	4	750	4500	1750	38	1750	443.8
Cluster 5 N=1	1	1	1	2750	2750	2750	2750	2750	2750

The results of the identification of cluster boundaries and median values, presented in Table 5, confirm the correct correlation of enterprises located in clusters 2, 3, and 5 with the proposed theoretical model. That is, in clusters 2 and 5 there are enterprises with a sequential type of organizational structure, and in cluster 3 – with a parallel type of organizational structure.

The analysis of the minimum and maximum values of the variables – the number of company units and the average number of employees in clusters 1 and 4 shows that:

1. these clusters include enterprises with both a sequential and parallel type of organizational structure (the number of company units varies from 1 to 7 or from 1 to 5 for clusters 1 and 4, respectively)

2. these clusters include enterprises of various sizes, ranging from small industrial enterprises / workshops to large industrial enterprises (the average number of employees varies from 3 to 750 people);

3. a comparison of the median values of the structural variables in clusters 1 and 4 with the average values shows a right-hand asymmetric distribution of the values of the variables with a bevel towards lower values. That is, most of the enterprises included in these clusters have a sequential production structure.

Thus, we can conclude that the results of the cluster analysis did not allow us to unequivocally identify a change in the type of production structure for enterprises of the first and second levels of development, but confirmed the conformity of the proposed theoretical model of enterprises with 3, 4 and 5 levels of development (see tables 1, 4 and 5).

Conclusion

Further discussion is required on reasons for the distribution of enterprises in clusters obtained in the framework of this study and their comparison with the theoretical model of the organizational structure evolution of industrial enterprises. First of all, it should be noted that the authors have previously conducted similar studies (Bobkov et al. 2017; 2018; 2019) in other economy sectors of the Czech Republic. The results obtained both confirmed the hypothesis of the alternation of two types of organizational structures – sequential and parallel, and coincided with the theoretical model of the organizational structure evolution for the studied industries. Moreover, in the indicated studies conducted for retail and private educational organizations, a similar set of variables was used. So, when conducting research on retail and private educational organizations, the

following structural variables were used (the first group of indicators): number of units; average number of employees in total, people; average number of employees per unit, people; age of organization (total number of years).

The following variables were used for evaluating the results of economic activity of organizations (the second group of indicators): value of total assets (thousand CZK); revenue per one unit (thousand CZK); depreciation amount (thousand CZK); labor productivity per value added (thousand CZK per person).

Considering the sample size in previous studies, in the analysis of retail organizations a sample of 1,695 organizations was used and the distribution by clusters was made according to 8 variables, and in the analysis of private educational organizations 377 organizations were used and the distribution by clusters was made by 8 variables. In the framework of this study, the sample of automotive companies was limited to 326 enterprises and the distribution of clusters was carried out by 7 variables. That is, it can be assumed that while reducing the number of organizations analyzed in the framework of the research and reducing the number of variables by which the clusters were distributed, the results of cluster analysis did not allow full alignment with the proposed theoretical model.

Considering the distribution of automotive enterprises by cluster, we see that 82.8% of all the enterprises studied were in one cluster (see Fig. 1). This is despite the fact that within the framework of this cluster there were enterprises that significantly differed from each other both in size (in the number of employees) and in structure (number of units). Proceeding from this, we suggest that further research in this industry should be focused on identifying a variety of variables (both structural variables and variables characterizing the economic activities of enterprises), conducting a cluster analysis of these variables and comparing the results with the proposed model for the organizational structure development of industrial enterprises.

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WHAT MAKES LUXURY HOLIDAY RENTALS SO DESIRABLE? –THE IMPORTANCE OF UNDERSTANDING THE DEMAND FOR LUXURY TOURISM SERVICES

Marta Cerović – Nadia Pavia – Tamara Floričić

Abstract

Purpose: The aim of the paper is to research the main aspects of tourist demand for luxury accommodation facilities with the focus on holiday rentals and to determine what are the factors that diverse standard from luxury services and facilities in tourism market.

Design/methodology/approach: The scientific research was conducted in December 2019 using a semi-structured interview with representatives of five travel agencies in Istria, specialised in luxury holiday rentals. They are recognised as reliable respondents who could evaluate and propose innovations for luxury accommodation. The interview consisted of three parts that explored: respondents' data that ensured sample qualification, main characteristics of holiday rentals and destination and the importance of specific tangible and intangible attributes that all together lead to innovative solutions for luxury services in holiday rentals.

Findings: The results of the research point to the importance of innovation in designing luxury accommodation services, which implies the optimal combination of tangible and intangible elements of quality. The increased importance of experiential value in tourism services indicates that active participation of all stakeholders involved in the design of luxury services is needed, both at operational and strategic levels.

Research/practical implications: The conclusions obtained can be used as guidelines for the future development and innovation of luxury accommodation services in holiday rentals. The research results may be useful for owners or managers of luxury holiday rentals, entrepreneurs dealing with luxury services in tourism and destination management.

Originality/value: The paper makes a valuable contribution to the scarce body of existing scientific knowledge focused on luxury services in tourism and represents one of the few studies on luxury holiday rentals, thus it contributes to the development of the science and the profession. The paper proposes innovative solutions in the field of SME for further development of this specific form of accommodation.

Keywords: holiday rentals, luxury villas, luxury accommodation, luxury services and facilities

JEL Codes: L1, M31, Z3

Introduction

Holiday rentals are one of the fastest growing segments of accommodation in the tourism market in recent years. They are often developed in the micro entrepreneurship spheres as SME projects and are characterised by a dispersed ownership of many small subjects. According to the European Holiday Home Association, holiday rentals have the largest capacity of beds in Europe (around 20 million beds), which is almost twice as much as hotel accommodation and was used by 45 million people in the past two years. According to an increased demand in the tourism market and other socio-economic circumstances, especially in countries with a developed tourism industry, in the last ten years, there has been an expansion of extremely high quality facilities in the holiday rentals market, i.e. equipment, facilities and services which they offer.

Innovations in conceptualisation of the product alone and implementation of technological solutions for sustainability contribute to the high-quality level and modernity of structures, although the design itself can follow different styles of arrangement. Although legislation measures the level of accommodation quality according to its technical equipment, the market conditions brought out an entirely new segment of accommodation offer – luxury holiday rentals, which mainly refers to luxury villas. Luxury accommodation includes services made to suit the guest, with the emphasis on comfort, relaxation, opulent quality, focusing on details and high standard, due to which elements of added value in a wider sense and exclusivity of experience are more important than the price (Page, 2011).

The accommodation facility quality grows parallel with the increased guest demand in all types of accommodation, which is reflected in their competitiveness; therefore, the importance of the experience value it provides to guests is ever-increasing. the experiences associated with travel are permanently stored in the human memory, which arouses the feeling of excitement and enjoyment. Holiday rentals represent a kind of a lifestyle accommodation, as they facilitate direct experience of a stay in the destination and one of the main advantages lies in the tailor-made service, due to the possibility of maximal personalisation in all offer segments. These are the very concepts on which rest the topicality of the subject which raises the interest of the profession, but also of the scientific community.

1.   Luxury accommodation - literature review

Innovative accommodation offer are important strategic features to ensure growth and development tourist destination. According Dias et al. (2012) accommodation innovation are organizational implications to services and changes focussing the tourist, with implications to services with different degrees of novelty. The goal of accommodations offer innovation is to provide better experience to fulfil customer needs. The identification of tourists needs is becoming increasingly difficult, so entrepreneurs and managers of tourist destinations are facing a new generation of tourists who expect higher services value as well as more precise fulfilment of their needs (Prystupa-Rządca and Starostka, 2015). Sotiriadis (2018), quote that the accommodation offers, from a service perspective, the product is the experience that is co-created by the tourists.

The tourism is dominated by small and medium-sized enterprises (SME). The various types of luxury accommodation, including luxury holiday villas, are increasingly entering the tourism sector as SME entrepreneurs. According Wang et al. (2020) luxury holiday rentals refer to entrepreneurial approaches within family business. Established by entrepreneurs who play significant roles in modifying the luxury services. SMEs are considered to be more inclined to openness in their innovative activity due to them having less resources available for in-house innovations (Shutyk, 2016). Tourisam and hospitality SMEs are primarily responsible for co-creating tourism experiences with guests, through the delivery of accommodation, additional services as well as cultural and entertainment experiences.

According to modern tourism trends, luxury accommodation facilities within households represent a large tourism potential. According to Pavia and Cerović (2019) household facilities are distinguished by the special approach to guests, personalised service, specific architectural, horticultural and design facility features and a low formalisation level. There are many affluent tourists who search for quality is growing and they define what that quality in holiday rental homes is, i.e. luxury holiday rentals seek to differentiate their offer in terms of size, physical features, recreation activities and the money invested in them (Harikson et al., 2018). For guests who are looking for value, uniqueness and personal experiences, luxury holiday rentals have become a trend in tourist demand, which encourages discussion about the fine distinction between standard, premium and luxury in terms quality and offer. Popescu and Olteanu (2014) differentiate the characteristics of luxury: excellence, which interprets the levels of prices with

perceived value, uniqueness, hedonism, quality and belonging to a certain social circle, so, accordingly, luxury accommodation is associated with exclusivity and wealth.

Luxury accommodation offer characteristics and points out that it is differentiated, unique and exclusive and that it is difficult to define what tourists see as superior, convenient and engaging. In terms of luxury accommodation, European luxury travellers are looking for: personalised service, preferably one on one, good-quality beds with good-quality bed linen, exclusivity and positive and professional interaction with staff. In the discussion itself concerning prioritisation of the elements of tourist experience, Colaco (2019) stresses: "Sun and luxury is great, but travellers will demand more enriching experiences", so for designing of a luxury tourism offer, all offer stakeholders should be focused on providing personalised experiences and unforgettable moments through an offer that is authentic, impressive, unique and exclusive (Cerović et al., 2019). Stakeholders in a destination are often faced with a situation in which a luxury offering is not defined by exceptional quality alone, that is, quality is no longer enough to differentiate products.

2.   Methodology

The problem of analysis of luxury products and services emanates from the subjectivism to which it is susceptible, so, when trying to define and quantify, most researches rely on measuring the quality of physical attributes (Lo and Au Yeung, 2019; Yang and Lau, 2015), while some authors focus on emotional value (Sthapit and Coudounaris, 2018; Brun and Castelli, 2013). Therefore, the research is focused on linking of these two concepts and determination of their causal relationships, which results in the increase of tourist demand and in research of luxury services on the example of holiday rentals, since the researches so far concern the hotel industry. The authors also noticed that there is an insufficient number of papers, by which the main preconditions of development and characteristics of demand for luxury accommodation offer in the segment of holiday rentals are explored and the lack of qualitative studies.

The semi-structured interview was the method of data collection. The authors examined the attitudes of 5 different travel agency representatives (3 managers and 2 owners) in Istria, specialised in sales of luxury holiday rentals, as they are considered reliable respondents. In the sense of luxury holiday rentals, Istria is considered the most developed region in the Republic of Croatia. Each agency was represented by one respondent, which made in total 5 respondents, and, although it does not represent large

sample, according to the influence and competence the authors present it as valid one. The size of the sample resulted from the willingness of the relevant representatives (specialised agencies) to participate as it is considered very important for the interview method, rather than formal sampling strategy so it represents the main limitation of the study. The interviews were conducted in December 2019 and authors approached individually to the agency representative, organizing the appointment with each one. In the pre interview phase, the researchers explained the purpose of the research to the respondents as well as the anonymity and confidentiality of given data. For that purpose, the respondents (given answers) are marked as A1, A2, A3, A4 and A5. The interviews were audio-recorded and transcribed by the researcher. Two researchers reviewed the responses independently, analysed the data together and developed four main themes as later shown in the Table 2.

The interview included the data concerning the validity and characteristics of the respondents; the twelve open ended questions; and the evaluation of the importance of specific tangible and intangible attributes of the luxury tourist offer in holiday rentals. The twelve open ended questions were asked as follows.

Which type of holiday rentals do you offer? What makes the fundamental difference between luxury and standard holiday rentals (tangible and intangible elements)? What type and level of service is required to be able to speak of a luxury property? Can you make a typical profile of the luxury holiday rental that guests are mostly looking for? What is the most common guest profile looking for luxury holiday rental in your agency? What are the biggest advantages, disadvantages and potentials of luxury holiday rentals? In your opinion, which segments of demand are still inadequately covered? What are the most significant issues for the luxury holiday rentals? How do you evaluate the ubiquitous use of the term "luxury" in the presentation of quality holiday rentals and what are the possible solutions in practice? How do you evaluate the competitiveness of the luxury holiday rentals you offer regionally and globally? What is your opinion on the possibility of branding luxury holiday rentals? Consider the occupancy rate of luxury holiday rentals. The results were grouped in categories: facilities, services, communication, quality innovation and destination offer and the proposal of new model emerged.

After twelve open ended questions the respondents were asked to express the opinion on the importance of specific tangible and intangible attributes of the luxury tourist offer in holiday rentals.

3.   Research and discussion

In the observed sample, 4 agencies have between 1 and 3 full-time employees and 1 agency employees between 4 and 9 full-time staff. The sample competency was evaluated by the level of education (1 respondent - Master of Science, 2 higher educations, 2 high school education) and years of service in tourism, as 4 respondents had more than 20 years of experience in tourism industry jobs. Also, according to the number of accommodation units 2 agencies manage the booking of 25 and more luxury holiday villas, 2 operate 11-25, 1 operates 1-10 holiday villas. By including other types of luxury holiday rentals (homes, residences, agrotourisms) the numbers are significantly higher speaking in favour of experience and validity of sample, rather small (5) but well experienced and positioned at tourism market. Sample description and the interview data follows in table below:

Tab. 1: Leading tourist agencies specialised in Luxury holiday rentals – sample data

Agency – Agency code*	Description	Number of Facilities	Interview taken on:
A1	Offer vacation houses to the guests with highest requirements of modern day tourism	138	11.12.2019.
A2	**Offer various types of accommodation including luxury villas and luxury rural houses with complete tourist services**	91	10.12.2019.
A3	Offer luxury holiday villas with wide range of services: „ Holiday Villa sin Istria for luxury holiday that you deserve"- marketing statement	21	13.12.2019.
A4	Specialised holiday rental agency with more than 10 years' experience. Offer an unique guest experience in our handpicked villas and apartments. – marketing statement	31	13.12.2019.
A5	Offer luxury villas, houses, apartments in nine rural destinations in Istria	80	17.12.2019.

* According to GDPR regulations, the coding: * „name of the agency" and „Agency code" remain in archive of the Authhors". Researched agencies (lsited randomely) are: Lovley Istria, Rural Concept, Solis, Danex andHoliday - SWAM.
Source: Authors' research.

Regarding the answers obtained from the agency representatives they point to the following conclusions.

The basic differences between luxury and standard accommodation offer in the segment of holiday rentals, facility appearance and equipment stand out, as well as the quality of available facilities, personalised service and additional activities, such as: organisation of excursions and events, transfers from the airport, wellness, children's playgrounds and gyms. The importance of what the facility contains and offers is

evidenced in the fact that, through them, the accommodation profile is made, regardless of whether the motives are related to the use of sports, wellness, children's or other facilities. They believe that luxury facilities include a premium service, from the moment of the first inquiry and booking to the check-out from the facility, with the accent on privacy, but provided that the hosts are available at any time in the event of any necessity. Consequently, they point to the problem of the ratio between the price and the quality and the problem of a shortage of skilled workforce. In the marketing sense, the problem emanates from the definition itself of luxury accommodation, pointing out that there is no unique thinking and that the current qualification comes down purely to the facility equipment, due to which the need imposes for definition of the minimal conditions. The respondents A1 stated *"What is really important to the guests is equipment, facility appearance, additional facilities and high service level, from booking, welcome, getting timely information and being at the guest disposal, prompt reaction in case of problems occurred…"*. Following, the respondent A3 said: *"In addition to exclusive equipment, for luxury rentals, an educated workforce that can provide the service at an adequate level is also very important"*.

The profile of guests who usually look for this type of accommodation consists of upper middle-class guests, primarily of families with children or larger groups (families or friends). Analysing future trends, the respondents state that the number of luxury accommodation facilities is growing, which is the result of an increase in demand for such a type of accommodation. *"Our guests are mostly families with children or couples, sometimes groups of young people"* (A2). The agencies also provide up-scale services for particular niche such as celebrities: *"We have had the cases including celebrities a few times, for which all services had to be agreed in advance to the finest details."* (A1)

Luxury accommodation facilities are associated with the tourist destination offer, which should fit in with the guest structure. However, the accompanying infrastructure shows deficiencies in the offer of additional facilities (sports, entertainment, cultural, gastronomic, etc.), which would complement the accommodation facility offer and, in that sense, improvements are essential, but additionally also calling for the necessity of introduction of new features in the facility itself. The respondent A4 emphasises *„Luxury rental in themselves are not the problem, the problem evolves from the infrastructure that is not accompanied by such facilities. There is a severe lack of gourmet restaurants, casinos, entertainment facilities, discotheques etc."*

The competitiveness of luxury holiday rentals is the result of internal factors (equipment and service, but also of the destination in which it operates. The occupancy rate of luxury holiday rentals (luxury villas) is higher than 120 days, which, in Croatian circumstances, is three times higher than the occupancy rate of standard holiday rentals (rooms and apartments). A higher occupancy rate directly affects the increase in income from accommodation, but also the increase in income from non-accommodation expenditure, especially if we take into consideration the purchasing power of guests staying in such facilities. The problem of competitiveness evolves from the fact that *"Competitive destinations also have a more competitive offer of luxury holiday villas, both at micro and global levels"* states the respondent A4. The additional problem for increasing competitiveness evolves from the awareness of residents *"Competitiveness is high, although the locals are not entirely aware of it. In some cases, they are not entirely aware of the demand trends either"* (A5).

The answers gained from the interview give an insight about the characteristics of tourist demand and potentials for the future development of luxury accommodation product and can be summarized in four main themes as shown in the Table 2.

Tab. 2: Important features of demand for luxury holiday rentals – the attitudes of travel agency representatives

Facility features and services	Guest profile	The destination quality	Competitiveness
- Overall quality of the facility - Equipment - Functionality - Privacy - Location - Being at disposal - Additional services (drivers, cooks, babysitters, chambermaids)	- Larger families - Young people - Companies - Several couples	- Quality restaurants - Entertainment facilities - Sport facilities - Organized excursions - Organized transfers - Wellness services - Airports	- International level – similar to other luxury rentals in Europe - Regional level – higher in comparison to the other types of accommodation facilities

Source: Authors' research.

The respondents pointed to the importance of tangible and intangible quality elements of luxury holiday rentals, which have not been covered by legally proscribed request for high category (4 and 5*) facilities.

From the supply side, very much of the attention should be given to the intangible characteristics of the luxury accommodation tourism product such as: efficient and fast service, staff professionalism and cleanliness, following which the possibility of communication in foreign language, atmosphere in the facility and safety and insurance

in the facility. The possibility of purchasing local products, as well as provision of "on request" services and private transfers influence the experience of the stay. When looking closer, it is interesting that availability of the host and friendly relationship towards guests are appreciated, but guests do not find, interaction with hosts, desirable. The afore-stated, gives an insight into the profile of guests who look for fast professional service, in a pleasant environment of privacy and safety and well developed tourism destinations with a broad spectrum of offers.

When considering tangible characteristics, they refer to facilities and equipment in luxury holiday rentals mostly as: the offer of facilities for children and pools and the facilities from the spectrum of wellness services, fitness centre, sauna and relax room. There is a lack of interest for the facilities related to the organisation of different events, business facilities and facilities for disabled persons. The respondents explain that much of the attention should be given to the activities and entertainment of the guests who seek for the departure from everyday business activities and responsibilities. Comparing the balance for importance of a "soft" (intangible) or "hard" (tangible) service component, a higher level of importance is evident of the service (intangible) system. It affects the level of the tourist experience and the perception of values, which corresponds to the theoretical hypotheses, presented though the literature review. New knowledge acquired through the results emphasise the importance of service quality and points to the need for specific skills development empowered through the education and learning. The post-modern tourists, users of luxury holiday rentals appreciate quick and reliable communication, fast supply and various services "on demand" and "on disposal" followed by adequate pricing. This proves the importance of the experiential value of the tourism product, which is especially important in luxury tourism, since those guests already possess luxury material goods. Therefore, as the main strengths of the luxury tourism product can be identified: the pampering, personalization, being on disposal and authentic experience.

Summarizing the results obtained from the research a model on influential factors on hospitality product in luxury holiday rentals emerged, which explains the relationship between key elements of the luxury accommodation offer.

Fig. 1: Entrepreneurial guidelines - model of influential factors on hospitality product in luxury holiday rentals
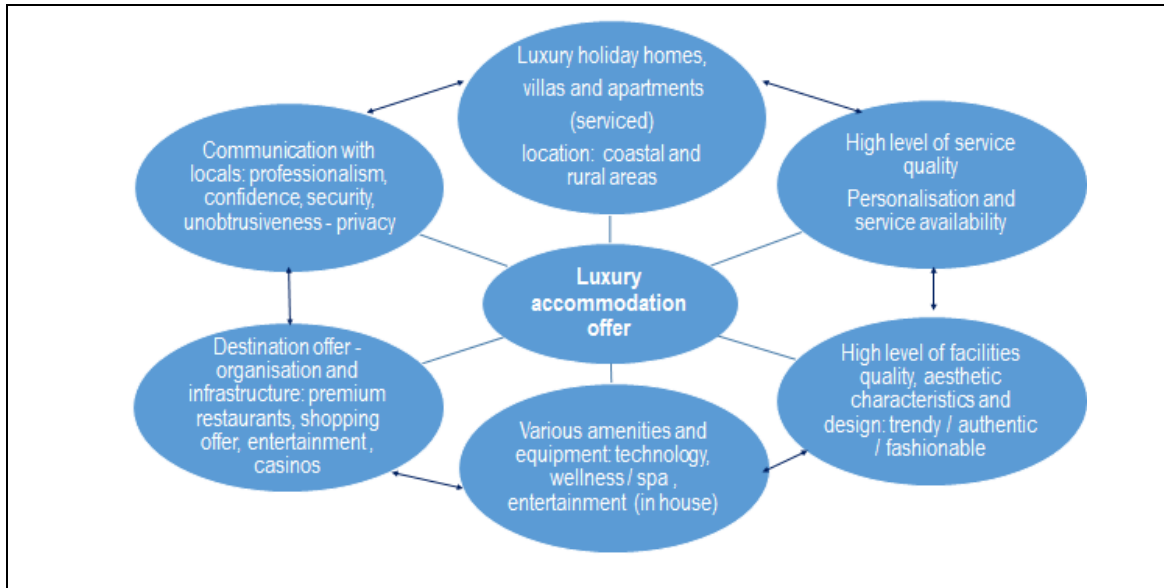
Source: Authors' research.

The model points to the connection between service segments for the purposes of formation of a comprehensive luxury tourism product, where tangible and intangible characteristics of accommodation structure are characterised by quality and value. When considering the physical components, they are implied and defined also by an official category. The services domain is of somewhat different character given that it is conditioned by a high level of personalisation, personal engagement and professionalism in approach by the provider. This is why continuing education is of an exceptional importance, from foreign languages to a wide range of familiarity with the tourism resource base and attractions. Cooperation of all stakeholders in the destination, starting from those who influence infrastructural facilities to DMO and DMC, which should work systematically on the creation of unique tourist experiences aimed at the demand market, i.e. clients of luxury holiday villas is required. The model shows main components of luxury tourism product in holiday rentals and can be useful for the entrepreneurs who tend to organise luxury holiday rentals as innovative and competitive accommodation product.

Conclusion

Following a thorough analysis of the theoretical hypotheses, previous researches and the authors' researches for the purpose of this paper, valuable and interesting scientific knowledge was generated, useful for practice, but also for the tourism field in science.

Although the question of luxury is ambiguous and invites controversies in conclusion making, the market has undoubtedly defined some basic postulates of this concept. Apart from the category itself of a facility, luxury includes superior equipment and especially service inside and outside the facility from the moment of booking to checkout.

Luxury holiday rentals have a high hedonistic value as they represent a home and a lifestyle for which guests who use them strive or practice. The particularity of holiday rentals, in general, lies in the aspiration towards experience of the local area and escape from a hectic lifestyle, which stresses the need for activities and services that ennoble body and soul. The confirmation of this thesis is also provided by this paper's research results, from which a considerable importance is noticeable of different types of facilities (sports, children's, entertainment, wellness and similar). The importance of these facilities is also contained in the fact that tourist stays for this segment of guests moves away from holiday tourism and transforms the importance of the material towards the experiential. For the creation of a complete product, accompanying infra and supra structure in the destination are considered to be exceptionally important, over which service providers have poor influence, making the importance of additional facilities all the more important, as they differentiate the offer, give sense to travel and very often represent a motive for choosing a specific facility. Despite the importance of additional facilities, intangible service elements are considered as exceptionally important, which proves that guests purchase experiences. In the sense of formation of luxury products in tourism, a greater accent should be put on intangible quality elements themselves, which inevitably includes continuing education of staff for the purposes of acquisition of specific skills and competencies.

Although the majority of luxury holiday rentals provide additional services, such as the possibility of organisation of transfers or excursions, specific services represent a potential for further development: services of a guide, a trainer, a therapist, an instructor, etc., which opens the possibility of preparation of an entire package for specific market niches. As a type of a lifestyle offer and a part of SME with a possibility of fast adjustment, luxury holiday rentals should look for their competitive advantage in service personalisation, as, with it, guests' specific wishes and interests are satisfied. For the future development of this segment of accommodation offer, it would be necessary to, at the regional level, but also more widely, define and unify minimal standards in order to avoid misuse of the term luxury, which has extensively been used in marketing campaigns

of all booking and other internet systems, very often without foundation. Apart from limiting the use of the term, for a better market positioning, the possibility lies in branding.

The results of this study posed the implications for practice and can be applied at: DMO (indicating the importance of quality infrastructure); DMC (wider range of different services is needed) and owners and managers (guests strive to personalization of services).

Although the main paper limitations are based on the size of the observed sample, the conclusions represent a valuable contribution to the knowledge from this field, as well as to the scarce body of literature in the field of luxury accommodation and services in tourism and can be the starting point for further researches which should include guests and the owners of accommodation facilities.

Acknowledgements

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ADOPTION OF BUSINESS INTELLIGENCE FOR SMES

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Abstract

Purpose: This paper analyzes the implementation of Business Intelligence (BI) in small and medium-sized enterprises (SMEs) as part of their efforts to increase their competitiveness in a highly dynamic business environment in West and Eastern Europe. A better understanding of the adoption levels of innovation by SMEs is highly relevant due to the important contribution of SMEs to both employment generation and economic growth in European countries.

Design/methodology/approach: The type of research is exploratory and descriptive, comparing a series of qualitative factors relevant to adoption of BI by SMEs, covering 9 European countries.

Findings: The research concludes that SMEs share the challenge of a lack of sufficient time and financial resources to cover the initial investment, a lack of qualified human resources and limited knowledge of users to effectively benefit from BI. The research also found that Cloud Computing (SaaS) and Mobile Business Intelligence (MBI) offer opportunities for SMEs to overcome these challenges.

Research/practical implications: This research serves as a guide for SMEs interested in implementing BI and to develop BI as a source of competitive advantage and business strategy. The analytical model could be used in future research for the analysis of the adoption of BI in other countries and to develop more standardized criteria for the selection of BI tools compatible with different SME sizes and categories.

Originality/value: The study offers a comparative analysis of the adoption and implementation of BI in SMEs in Western and Eastern European countries with interesting findings that can be found counter intuitive to the expected adoption levels in more and less developed economies.

Keywords: Business Intelligence (BI), Information Technology (IT), Information Systems (IS), small and medium-sized enterprises (SMEs), digital transformation

JEL Codes: O52, O57, L86

Introduction

SMEs are companies with limited resources, but just as large companies need to adopt new methods of doing business and stay competitive in the market of the fourth industrial revolution. Part of their survival strategy, SMEs are to integrate digital technologies such as Business Intelligence (BI) into their structures and operations.

Digital transformation in companies has reached a high level of maturity globally with almost half of the Information Technology managers have already changed their business model to support the integration of digital initiatives (Fraga, 2018).

The rapid development of the ICT (Information and Communication Technologies) industry and its solutions based on digital transformation allow companies the possibility to access a more affordable and more feasible product (Stjepić et al., 2019).

A survey of more than 4000 IT managers conducted by Gartner Group revealed that BI is ranked as the number one technology priority in organizations. A similar survey of IT managers conducted by IBM revealed that BI is the primary visionary plan to improve business competitiveness (Bernardino, 2013).

This study of BI adoption in SMEs show that Business Intelligence introduces benefits and efficient results for the business and the idea that is not only for large companies.

1.   Key concepts

1.1   Business Intelligence (BI)

Williams and Williams (2007) define BI as the combination of products, technology and methods for the management of key information. BI could be defined as business information and information analysis within the context of key processes that lead to decision making and action execution.

BI software covers business areas such as customers, profiles, customer service, market research/segmentation, etc. (Baars and Kemper, 2010).

BI is a key tool to increase the competitiveness of an SME through the knowledge that is generated from data, with Business Intelligence companies can optimize organizational resources, improve performance, save resources, create business value and strategies.

1.2 The importance of small and medium-sized enterprises (SMEs)

According to the European Commission, small and medium sized enterprises are defined as enterprises that represent 99% of the total population of enterprises in the EU. The factors that determine whether a company is an SME, or a large company are the number of employees and the turnover or balance sheet total (European Commission, 2012), as shown in Table 1.

Tab. 1: Category of small and medium-sized enterprises

Company category	Staff headcount	Turnover	Balance sheet total
Medium-sized	< 250	≤ € 50 m	≤ € 43 m
Small	< 50	≤ € 10 m	≤ € 10 m
Micro	< 10	≤ € 2 m	≤ € 2 m

Source: "What is an-SME? - European Commission", 2019.

Based on the Annual Report on SMEs, SMEs are the backbone of the European economy (Makowska et al., 2018). Furthermore, the report states that SMEs generate the largest number of jobs by 66% in Europe.

The OECD (2017) states that SMEs provide the main source of employment and represent about 70% of jobs on average in the world, and are the main contributors to value creation, generating between 50% and 60% of value added on average. In emerging economies, SMEs contribute up to 45% of total employment and 33% of GDP. These data confirm the importance of SMEs in Europe and hence the importance of further research into key drivers of competitiveness and growth such as BI.

2. Theoretical background

Several studies show that there are many theories for adoption of Information Technologies and Information Systems (Chong et al., 2009; Oliveira and Martins, 2011; Arpaci et al., 2012). At an individual level (person, user), we can identify the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), the Unified Theory of Technology Acceptance and Use of Technology (UTAUT).

In addition, these authors identify two prominent theories for the adoption of Information Technologies and Systems at an organizational level, the Diffusion of Innovation (DOI) theory and the Technology, Organization and Environment Framework (TOE).

The model by Charalambos et al. (1995) presents three sets of factors specific to SMEs, namely, the perceived benefits of IT innovations, the readiness of the organization (financial & IT resources), and external pressures (competitive, etc.).

When addressing a specific IT/IS adoption environment, it is important to combine several relevant theoretical models and constructs to achieve a reliable view of the adoption phenomenon (Oliveira and Martins, 2011).

The model used the work of Puklavec et al. (2014) presents 11 determining factors (positive and negative) involved in the adoption of BI in the European SME sector.

3. Empirical Approach and Data

This research works with the 11 determinants that influence the adoption of BI in SMEs, proposed by Puklavec et al. (2014). Their model was never tested against real data. To extend their work, we propose to validate their model by choosing 9 European countries and compare their results after scoring the determinants for each country. These countries are Sweden, Croatia, Poland, United Kingdom, France, Bosnia and Herzegovina, Macedonia, Germany and Romania.

The scales to be used to analyze each country are of the Likert type and the evaluations are made empirically by the authors based on the observation of the events that took place in each country with respect to the topic studied.

Of the 11 available factors, only 10 will be evaluated, the size indicator cannot be used due to the lack of concrete data in the selected case studies.

The case studies analyzed and evaluated are shown in Table 2:

Tab. 2: Case Studies used in this work.

Title	Country	Authors
The Use of Business Intelligence (Bi) In Small and Medium-Sized Enterprises (Smes) In Bosnia And Herzegovina	Bosnia and Herzegovina	(Kasim Tatić1 et al., 2012)
Business Intelligence Solutions for SME's	Romania	(Tutunea and Rus, 2018)
Critical Success Factors for Implementing Business Intelligence Systems in Small and Medium Enterprises on the Example of Upper Silesia, Poland	Poland	(Olszak and Ziemba, 2012)
Mobile business intelligence adoption (case of Croatian SMEs)	Croatia	(Dubravac and Bevanda, 2015)
Business Intelligence during times of crisis: Adoption and usage of	Western Macedonia	(Antoniadis et al., 2015)

ERP systems by SMEs		
An evaluation of Business Intelligence Software systems in SMEs – a case study	Sweden	(Nyblom et al., 2012)
UK SMEs: Brexit and Beyond.	United Kingdom	(Dun and Bradstreet, 2018)
Challenges of Business Intelligence Adoption in Small and Medium-Sized Enterprises.	Germany	(Scholz et al., 2010)
A business intelligence model for SMEs based on tacit knowledge.	France	(Sadok and Lesca, 2009)

Source: Own elaboration based on several articles mentioned above (2019).

3.1 Proposed Metrics and Scales

To define a standardized measure scheme, we define two scales that will be used each with a set of factors from the model. The first metric evaluates knowledge, experience, use and adoption of systems (BI and ERP), productivity, management, performance, resource availability and external support. Metrics range from 1 to 5, with 5 being the highest rated, and 1 the lowest rated. This scale is applied to: management support, expected benefits, perception of strategic value, winning project, financial resources, BIS part of ERP and external support, as shown in Table 3.

Tab. 3: Knowledge scale by grade

Answers	Very little / nothing	Little	Fairly enough	Enough	Much
Score	1	2	3	4	5

Source: Own elaboration based on the work from Toledo (2019).

The second metric includes: data environment, organizational culture and readiness through the level of database knowledge, data quality, understanding of organizational culture, productivity, participation, readiness and employee satisfaction as shown in Table 4.

Tab.4: Level knowledge scale

Answers	Very bad / insufficient	Bad	Regular	Good	Excellent
Score	1	2	3	4	5

Source: Own elaboration based on the work from Toledo (2019).

Figure 1 shows the matrix with the assessments for the countries and the determinants for the adoption of BI. A degraded color scheme is used. These colors indicate a high (green), medium (yellow) or low value (red) from the selected scale used.

Conclusions

At the end of the research it can be concluded that BI is not only for big companies, this is a wrong opinion that has spread and positioned itself in the world, Business Intelligence is also of great help for small and medium companies in the management of their strategic activities. This deduction is supported by the case studies experienced in the different SMEs by country and the high scores obtained in the matrix on factors such as expected benefits and perception of strategic value in most of the countries studied.

Large software providers such as Microsoft, Oracle, SAP, Micro Strategy, among others, have already focused and adapted Business Intelligence systems to the needs and limitations of the SME segment. the biggest challenge for adopting and non-adopting SMEs of BI in all countries studied is the availability of resources. The lack of resources, both human and financial are still important barriers for SMEs to adopt BI. The cost of implementing BI by SMEs are high relative to their turnover and requires considerable time which most SMEs do not have. Another challenge is the lack of knowledge, talent and the necessary competencies of managers and employees to adopt and implement BI in SMEs.

Among other challenges for the adoption of BI, is the lack of specialists with skills in analysis, design, development and implementation of ICT projects to lead and manage at a strategic level the processes of adoption and technological innovation in SMEs.

Another challenge that companies face is the choice of Business Intelligence System (BIS), because managers choose the cheapest solution, and that solution is not compatible with other systems, it does not adapt to the sector or industry, it is not user friendly, it is not efficient, the implementation is slow, etc., and finally, the cost of working with that software is much higher, because the BI system is not efficient, it is not productive and it does not generate good reports and this translates into bad actions and bad decision making.

Fig. 1: Scoring matrix of variables and countries

European Regions	Determinants	Manage-ment support	Expected benefits	Organiza-tional Culture	Perception of strategic value	Project champion	Organization al data environment	Financial resources / cost	BIS part of ERP	Organiza-tional readiness	External Support
	Countries										
Western Europe	Romania	3	4	3	4	2	2	1	1	1	3
	Poland	1	3	2	3	1	2	1	2	1	4
South Europe	Croatia	2	3	3	4	2	3	1	1	1	2
	Bosnia and Herzegovina	3	4	3	3	1	3	1	3	2	2
	Macedonia - Greece	4	5	4	4	4	4	3	5	4	4
Northern Europe	Sweden	3	3	4	2	3	2	2	2	3	2
	United Kingdom	3	3	3	2	2	3	2	2	2	2
Eastern Europa	Germany	4	5	3	5	2	2	2	1	2	1
	France	2	2	1	2	1	2	1	1	2	1

Source: Own elaboration (2019).
The order of the determinants in the matrix is arranged from highest to lowest scores based on the study made by Puklavec et al. (2014)

SME managers should consider many criteria for the selection of an Information System, for example, the type of IT infrastructure the company already has, in case of having a Microsoft, SAP, ERP or other infrastructure, acquire a software from the same supplier, for a quick and easy implementation, adaptation, compatibility and learning by users. This is the case of Macedonia, where companies already had ERP and the adoption of BI was successfully executed in SMEs.

On the other hand, the external support of BI is very significant, however in the samples of SMEs studied it was evaluated in its majority as scarce, that is why the participation or collaboration of the support also influences the adoption of BI and should be considered in the selection of systems, since this technical support is fundamental and in many cases for SMEs it is a unique support, because these companies do not have an IT area and wide knowledge of IT and BI.

Within the financing methods specifically in the case of the United Kingdom, most of the SMEs express that; the government is one of the main sources of financing and it should demonstrate greater support to SMEs, to overcome challenges such as financing IT projects.

The availability of resources is an impediment and is a common behavior that has been detected in SMEs, because these companies have limited resources unlike large companies, however, today's trends offer many possibilities and solutions to implement BI, these trends are, the Cloud Computing, SaaS, Open Source and MBI. These solutions allow SMEs to feasibly and affordably adopt BI in their businesses, because they do not require large investments in data warehouses, hardware, software, assets, equipment and IT infrastructure.

Adopting Business Intelligence should be considered as an investment in a company's asset and should not be a cost and waste of time, this tool should be taken advantage of by the SMEs, besides in the analyzed cases it is demonstrated and affirmed that there are resource and cost savings after implementing a BI solution.

The model could be applied to SMEs from other continents or developing countries as in the case of Paraguayan SMEs, because the study is quite impartial, homogeneous and uniform, it is applied to different types of economies such as that of Paraguay, and this provides greater development for SMEs, thus increasing the economic growth of a country. Neubert and Van der Krogt (2018) identify the main factors that determine the use and selection of BI services in software companies in Paraguay, for internationalization purposes; these factors coincide with the factors studied; costs, benefits, trust, and customer service by the provider.

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DIGITAL COMMUNICATION OF WINE ROUTES IN SLOVAKIA, CZECH REPUBLIC, GERMANY AND AUSTRIA

Lucia Coskun – Marián Zajko

Abstract

Purpose: The paper analyzes the influence of the social media portfolio and online presence of wine routes in Slovakia, Czech Republic, Germany and Austria to support innovation and regional development of tourism in Slovakia. The revealed regional differences serve as a base for recommendations on improving efficiency of digital marketing and building a brand for the Slovak wine routes.

Design/methodology/approach: Sales of wine companies and visitor numbers in particular Slovak regions in years 2014 – 2018 were analyzed and correlation analysis was used to evaluate these data. The data on online presentation of wine routes in Slovakia, Czech Republic, Germany and Austria were evaluated by statistical methods in order to carry out comparative analysis of their communication strategies and social media portfolio.

Findings: A correlation between the sales of wine companies and the number of visitors in the regions of Nitra and Banská Bystrica was found. An online presence and social media usage are region depending and underestimated in Slovak wine routes. The digital branding of wine regions in Austria and Moravia may serve as a source of inspiration for Slovak wine regions. Building up social media presence and a common brand of the Slovak wine routes are recommended to boost the regional development of tourism.

Research/practical implications: Innovation possibilities in the digital marketing communication of Slovak wine routes and particular strengthening of the regional wine tourism were outlined. It may contribute to regional development along the entire value chain of wine production and support the tourist business.

Originality/value: The main contribution of this paper is a developed recommendation to improve the digital communication and branding of Slovak wine routes based on the analysis of wine routes in four Central European countries.

Keywords: wine routes, digital marketing, social media

JEL Codes: M00, M30, M31

Introduction

The wine culture has a very long history dating back to the ancient times. Wine plays a significant role not only in gastronomy but also in tourism. Wine regions are attracting visitors with offers which include regional history, attractions, restaurants, accommodation and many others. This is why regional wine routes came into being in Europe. The combination of innovations in tourism and oenology helps tourists find a comprehensive offer of services, which is optimal for the region. Wine tourism has become a fast-growing business sector, with an estimated 30% growth in 2018. It has emerged as a strong and rising area of special interest tourism, representing an increasingly important element of regional and rural tourism development (Avgeli et al., 2019). Avgeli et al. analyzed motivating factors influencing winery visitation, wine tourists' level of satisfaction, interest and knowledge on wine, as well as their demographic characteristics. Results showed that the most popular activity for wine tourists visiting wineries in Santorini (Greece) was wine tasting and the main motives influencing their decision on winery visitation involved wine tasting and experiencing the winery atmosphere. This research also showed that the most important factors contributing to wine tourist's satisfaction involved attitude, professionalism and knowledge of winery staff, as well as service quality (Avgeli et al., 2019).

Business aspects of wine routes and social media

Wine routes are a significant form of tourist offer of the modern age and have been specifically developed around big cities being an important segment of the tourist offer and additional income of residents of rural areas (Grgic et al., 2019). In the era of Internet, mobile technologies and social networks, the wine tourism sector has much to gain from increased information exposure. Wine enterprises, creating a point of diversity by a unique and attractive story about their company, products, events, activities and destination, play a key role in building a credible brand and increasing profit, along with improving the image and brand identity of the whole wine region (Bonarou et al., 2019). 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). Smart wine-tourism consists in using digital technologies such as Wifi and IoT to target nearby wine tourists and invite them to enjoy a wine experience while they visit rural areas (Pelet et al., 2019). The study of Pelet et al. shows the importance of providing Internet access, thanks to Wifi terminals and IoT along the roads in touristic areas, to facilitate winery visits and or other touristic activities. Wifi could provide the digital infrastructure necessary for businesses to target tourists through location-based systems (LBS) and push notifications (Pelet et al., 2019). According to the results of Grgic et al., respondents in the study visit the wine roads mostly because of wine tasting (39.3%) followed by tourist contents (16.8%) and occasional events (15.9%). They are relatively satisfied with the offer (57.9%) and believe that wine roads need better promotion. The research showed

that respondents with higher or high school degree visited the wine roads more often than those with completed secondary education. The level of household income has a significant impact on the frequency of visits of wine routes (Grgic et al., 2019).

Social media (SM) include various web services, such as social networks (e.g. Facebook, Twitter, Google+), media platforms (e.g. YouTube, WordPress, Flickr), business networks (e.g. Xing, LinkedIn) and recommendation platforms (e.g. Yelp, WhoFinance) (Hilker & Zajko, 2015). The results of the study of Sogari et al. show that the power of social media increases sustainability awareness and consecutively influence the consumer's buying behavior for wine. From a marketing perspective, companies should improve their capacity to share and communicate their environmental activities through social media (Sogari et al., 2017). Empirical study of Canovi and Pucciarelli in the North Italian region of *Langhe* shows that while the majority of winery owners recognize the social, economic and emotional benefits of social media, they are far from exploiting its full potential, partially due to barriers such as their agricultural mentality and the time-consuming nature of social media (Canovi and Pucciarelli, 2019). Social media usage was found to be positively related to online wine buying, and consumer's objective and subjective knowledge moderates the relationship between social media usage and online wine purchasing (Pucci et al., 2019). The findings of Galati et al. show that wineries most involved in corporate social responsibility initiatives and in the active communication of these initiatives on social media platforms are those that are most active on social media and in particular those that interact most with their web users, triggering in them some reactions that lead to the sharing of content and, therefore, having a significant impact on the dissemination of information through SM (Galati et al., 2019).

Younger consumers were found to be significantly more inclined to use Web 2.0 information sources, such as wine blogs, wine applications, their contacts' recommendations on social media and wine experts on social media. Older consumers were more likely to use their own wine knowledge (Bauman et al., 2019).

A study of Italian wine industry presents 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).

Innovative wine tech companies empower the wine consumers/tourists to be converted from passive consumers of wine offerings to co-creators, co-designers, co-marketers and even co-investors of their own personalized wine tourism experiences. To enable wine consumers/tourists to

become capable and skilled wine co-producers, wine tech companies have also developed edutainment online business models aiming to empower its users with the necessary wine knowledge and skills (Sigala and Haller, 2019).

1.   Methodology

The research leans upon our previous research of the wine market (Coskun et al., 2017). The aim of the study in 2017 was to find out how the wine companies proceed when building a brand in the digital world. The results of the study showed regional differences of the wine markets of Slovak Republic, Czech Republic and Germany.

In the following research, the communication strategy and the social media portfolio of wine routes in Slovakia, Czech Republic, Germany and Austria were studied and are presented in this work with the aim to consider digital branding strategy for Slovak wine routes.

Slovak wine routes respond to the Slovak geographical regions: Bratislava, Trnava, Trenčín, Nitra, Žilina, Banská Bystrica, Prešov and Košice. Sales of wine companies in years 2014 - 2018 were received directly from the Statistical Office of the Slovak Republic (SOSR), SKNACE 11020. All available sales of the Slovak regions: Bratislava, Trnava, Nitra, Banská Bystrica, Prešov and Košice have been considered. Due to the small number of wine companies in the regions Trenčín and Žilina, the SOSR does not provide sales of wine companies in these two regions. Numbers of the visitors and an average of overnight stays used in the study were received from the publications of the Ministry of Transport and Construction of the Slovak Republic (2018, 2019). The numbers of the visitors include all domestic and foreign visitors and are presented as an average value. It enabled investigation of relationship between the sales of wine companies and number of visitors in six Slovak regions in 2014 to 2018 by means of correlation analysis.

The following sample of the wine routes has been considered in the research: 8 Slovak, 11 Czech from Moravia region, 12 German and 18 Austrian wine routes. The sample includes best known wine routes in each country. The attributes of communication - „storytelling", „accommodation", „events" and „presence of the wine companies" in the online presence of wine routes were compared in these countries. Each wine route has been analyzed concerning the presence of the attributes and evaluated by binary values. In the next step portfolio attributes in the social media Facebook, Twitter, Instagram and You Tube, Vimeo were analyzed.

Czech and Austrian wine routes are efficiently centralized under specific brands as Moravské vinařské stezky (2020) in Czech Republic and Österreich Wein (2020) in Austria. In these two countries the brand and the presence of these specific routes have been investigated in order to develop recommendations on improvement of the marketing strategy for Slovak wine routes.

2.   Results and discussion

2.1   Slovak wine routes and Slovak regions

Slovak wine routes have been geographically assigned to Slovak regions. Slovakia consists of 8 regions: Bratislava, Trnava, Trenčín, Nitra, Žilina, Banská Bystrica, Prešov and Košice. Relationship between sales of wine companies in years 2014-2018 and the number of all visitors, number of visitors from foreign countries, average lenth of the overnight stays of all tourists and of foreign tourists have been studied for regions Bratislava, Trnava, Nitra, Banská Bystrica, Prešov and Košice.

The statistics show that the highest values of sales of wine have been registered in the region of Nitra with 41,163,311 EUR in 2018 and 41,599,766 EUR in 2017. The region of Trnava (32,249,204 EUR in 2018 and 29,630,295 EUR in 2017) and the region of Bratislava (31,572,858 EUR in 2018 and 32,247,320 EUR in 2017) achieved the second highest sales. The highest number of the tourists visited Bratislava region in the years 2015-2018, over one million a year. In 2018 there were even 1,460,130 visitors registered in the accommodation facilities. The number of foreign visitors reached the top value of 949,468 persons in the Bratislava region in 2018 as well. However, the lowest average length of the overnight stays of foreign tourists was recorded in the region of Bratislava, too. The reason may lay in the closeness of Bratislava region to frontiers with Austria, Czech Republic and Hungary and the visitors used just 1 to 2 days trips to visit Slovakia (Tab. 1 to Tab. 6).

Tab. 1: Bratislava region

Year	Sales of wine companies in EUR	All visitors	Foreign visitors	Overnight stays - all visitors	Overnight stays - foreigners
2014	25,483,968	954,888	605,480	2.1	1.8
2015	24,497,968	1,194,479	767,107	2.1	1.8
2016	33,090,503	1,386,283	892,771	2.2	1.8
2017	32,247,320	1,447,811	930,643	2.1	1.8
2018	31,572,858	1,460,130	949,468	2.1	1.8

Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Tab. 2: Trnava region

Year	Sales of wine companies in EUR	All visitors	Foreign visitors	Overnight stays - all visitors	Overnight stays - foreigners
2014	32,092,577	268,362	114,498	4.1	4.8
2015	30,446,849	297,693	121,487	4.0	4.7
2016	32,068,064	318,524	133,352	3.8	4.3
2017	29,630,295	366,717	159,407	3.7	4.1
2018	32,249,204	365,027	157,856	3.7	4.0

Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Tab. 3: Nitra region

Year	Sales of wine companies in EUR	All visitors	Foreign visitors	Overnight stays - all visitors	Overnight stays - foreigners
2014	35,921,725	236,875	89,214	2.8	3.0
2015	36,206,374	261,582	97,006	2.7	2.9
2016	39,854,874	298,829	119,212	2.8	3.1
2017	41,599,766	324,652	127,281	3.0	3.3
2018	41,163,311	335,670	133,688	2.9	3.1

Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Tab. 4: Banská Bystrica region

Year	Sales wine companies in EUR	All visitors	Foreign visitors	Overnight stays - all visitors	Overnight stays - foreigners
2014	4,116,446	384,801	64,497	3.4	2.9
2015	4,060,278	448,568	76,918	3.1	2.6
2016	5,823,797	520,895	87,282	3.1	2.7
2017	6,316,788	569,164	94,077	3.0	2.5
2018	6,954,484	627,660	103,033	2.9	2.6

Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Tab. 5: Prešov region

Year	Sales wine companies in EUR	All visitors	Foreign visitors	Overnight stays - all visitors	Overnight stays - foreigners
2014	36,575	642,706	209,151	3.3	3.2
2015	40,486	740,701	232,366	3.2	3.1
2016	27,193	854,528	270,188	3.2	3.1
2017	22,192	894,173	276,666	3.1	3.0
2018	-	932,121	285,225	3.1	3.0

Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Tab. 6: Košice region

Year	Sales wine companies in EUR	All visitors	Foreign visitors	Overnight stays - all visitors	Overnight stays - foreigners
2014	4,928,292	314,651	105,209	2.1	2.2
2015	5,664,319	260,494	86,262	2.2	2.7
2016	9,243,818	266,358	85,560	2.1	2.2
2017	10,566,618	347,014	117,560	2.1	2.2
2018	6,975,259	386,088	135,430	2.1	2.2

Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

The relationship between the sales of wine companies and the number of all visitors in the years 2014 to 2018 in the regions were analyzed by means of correlation analysis (Fig. 1 to Fig. 6). The results proved a significant correlation in the regions of Nitra and Banská Bystrica. The Nitra region is a very important element of wine tourism in Slovakia since it recorded the

highest annual sales of wine companies as well as top average lengths of overnight stays of foreign visitors in 2017 (3.3 days) and in 2018 (3.1 days). Nitra royal wine route has had a long tradition and has been active in organizing several wine events as well. Banská Bystrica has been organizing the event Vínšpacírka, since 2014 and several wine companies and restaurants participate in the event regularly.

Fig. 1: Bratislava region from 2014 to 2018
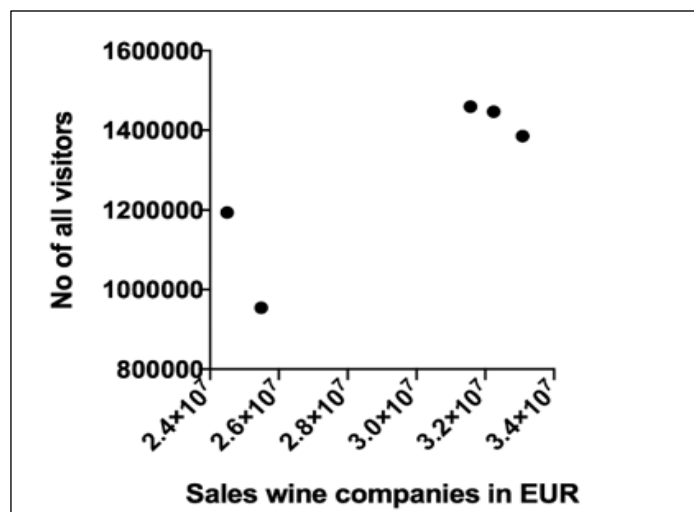
Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Fig. 2: Trnava region from 2014 to 2018
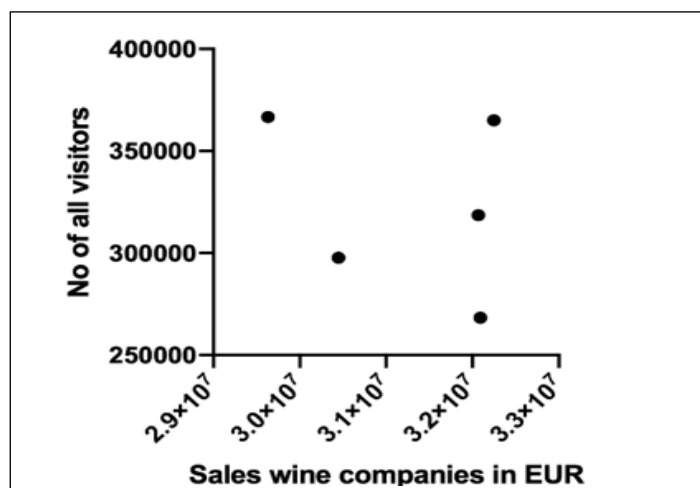
Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Fig. 3: Nitra region from 2014 to 2018

Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Fig. 4: Banská Bystrica region from 2014 to 2018
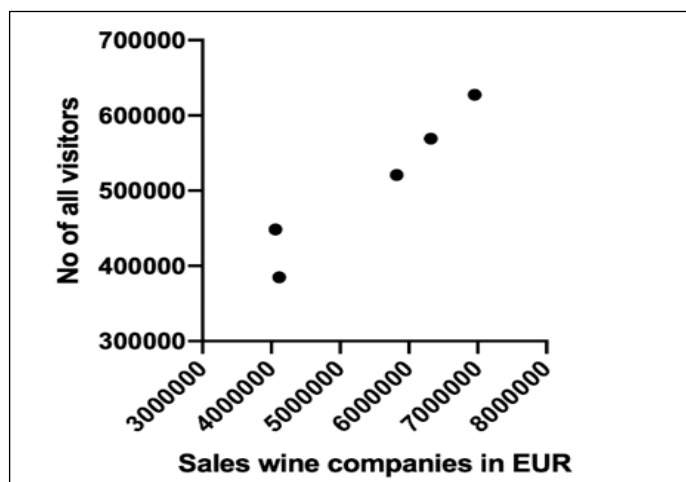
Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Fig. 5: Prešov region from 2014 to2018
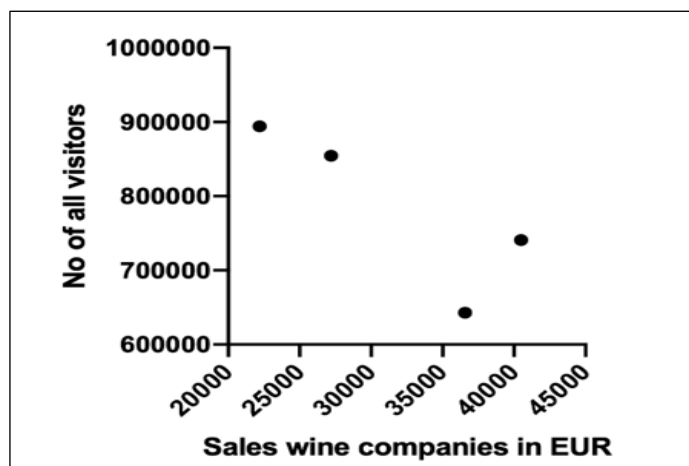
Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

Fig. 6: Košice region from 2014 to 2018
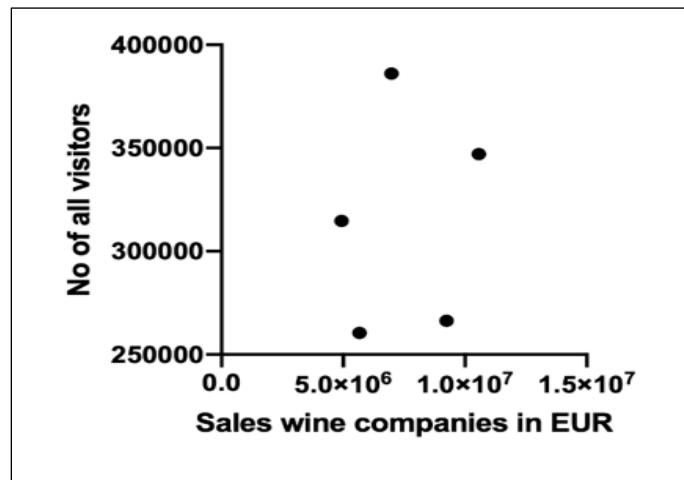
Source: Authors` elaboration of data from Statistical Office of the Slovak Republic (2020) and Ministry of Transport and Construction of the Slovak Republic (2018, 2019).

3.   Digital presence of wine routes in the Central Europe

3.1   Slovak wine routes

First, the Slovak wine routes were investigated. No existing brand promotion of all Slovak wine routes or a group of them routes was identified. For this reason a sample of seven Slovak wine routes was investigated: Small-Carpathian wine route (Malokarpatská vínna cesta), Kamenina wine route (Kameninská vínna cesta), Záhorie wine route (Vínna cesta Záhorie), Modrý kameň wine route (Modrokamenská vínna cesta), Tokaj wine route (Tokajská vínna cesta), Turnianska wine route (Turnianska vínna cesta), Veľkokrtíšska wine route (Veľkokrtíšska vínna cesta) and Nitra royal wine route (Nitrianska kráľovská vínna cesta). In the category communication strategy there were selected the communication attributes of websites considered to be essential for customers' value of a specific wine route, such as „storytelling", „accommodation", „events" and „presence of the wine companies". The attribute „storytelling" creates an emotional tie to a tourist, „accommodation" and is essential for travel planning of a tourist. „Presence of the wine companies" and „events" represent possibilities of an access to the wine producers. The appropriate combination of the attributes has an influence on a decision of potential customers. The results are presented in the Tab. 7. It has been found out that only 25% of the Slovak wine routes present the accommodation possibilities.

Tab. 7: Communication strategy of Slovak wine routes

	Storytelling	Accommodation	Events	Wine companies
Communication attributes	62.50%	25.00%	62.50%	62.50%

Source: Own processing.

The second investigated category was the social media portfolio of Slovak wine routes to find out if the use of social networking websites Facebook, Twitter and Instagram strengthened the brand of the respective wine route. For the evaluation of this category were wine companies selected using various social media for digital branding. The metrics applied was whether the chosen wine routes used social networking sites, such as Facebook, Twitter, Instagram as well as video channels on YouTube and Vimeo. The results are presented in the Tab. 8.

Tab. 8: Social media portfolio of Slovak wine routes

	Facebook	Twitter	Instagram	You tube	Vimeo
Use of SM sites	62.50%	0.00%	37.50%	75.00%	0.00%

Source: Own processing.

Only small number of the Slovak wine routes use social media for brand building. Surprisingly, 75% of the Slovak wine routes are presented on the YouTube. This is due to the TV series about the Slovak wine routes shot by the Radio and Television of Slovakia (RTVS) and verybuzy s.r.o. in 2014.

There are some Slovak websites offering an overview about the Slovak wine routes with various level of detail and multilingualism. For instance the website of Slovakia travel (2020) offers an overview about the Slovak wine routes in six languages (Slovak, English, German, Hungarian, Polish, Russian, Chinese). However, no brand for all Slovak wine routes or a group of them has been created.

3.2 Czech wine routes

Best known Czech wine routes are situated in Moravia. Eleven wine routes and seven more routes have been identified in this part of Czech Republic and are presented at Moravské vinařské stezky (2020): Moravian wine route (Moravská vínna cesta), Brno wine route (Brnenská vinná stezka), Bzenec wine route (Bzenecká vinná stezka), Kyjov wineroute (Kyjovská vinná trasa), Mikulov wine route (Mikulovická vinná trasa), Mutěnice wine route (Mutěnická vinná stezka), Podluží wine route (Vinařská stezka Podlužím), Strážnice wine route (Strážnická vinná stezka), Uherské Hradiště wine route (Uherskohradišťská vinná stezka), Velké Pavlovice wine route (Velkopavlovická vinná stezka) and Znojmo wine route

(Znojemská vinná stezka) plus 7 more routes. It was found out that this region had followed the strategy of creating regional brands of wine routes to support the wine tourism. The brand name Moravské vinařské stezky is presented in Czech and English and focuses on cycling tourism. It was supported by the foundation Nadace partnerství to boost the environment and tourism promotion of the region. The route net covers 1200 km linking vineyards and wine companies and promoting South Moravia. The story of the wine region is described and explained, the coming events are available, trips as well as a map of the routes are easy to access. The strong presence at Facebook and YouTube supports this brand but without any presence on Instagram, Twitter or Vimeo. The results of the wine routes at Moravské vinařské stezky (2020) are shown in the Tab. 9.

Tab. 9: Communication strategy of Czech wine routes

	Storytelling	Accommodation	Events	Wine companies
Communication attributes	100%	83.33%	100%	100%

Source: Authors` elaboration of data from Moravské vinařské stezky (2020).

3.3 German wine routes

A sample of 12 German wine routes were analyzed, however, no brand promoting all or a group of German wine routes was identified. The communication strategy and social media portfolio of the respective German wine routes were investigated and are shown in the Tab. 10 and Tab. 11. The following German wine routes were analyzed: Ahr-Rotweinstraße, Badische Weinstraße, Bocksbeutelstraße in Franken, Deutsche Weinstraße, Weinstraße, Kraichgau-Stromberg, Moselland Weinstraße, Naheweinstraße, Pfälzer Weinstraße, Rheingaer Rieslingroute, Sächsiche Weinstraße, Württemberger Weinstraße.

Tab. 10: Communication strategy of German wine routes

	Storytelling	Accommodation	Events	Wine companies
Communication attributes	100%	100%	91.67%	100%

Source: Own processing.

The analyzed attributes of communication strategy are more or less an obligatory aspect of the selected German wine routes unlike in the Slovak wine routes.

Tab. 11: Social media portfolio of German wine routes

	Facebook	Twitter	Instagram	You tube	Vimeo
Use of SM sites	75.00%	25.00%	16.67%	100.00%	33.33%

Source: Own processing.

The analyzed German wine routes show strong presence on Facebook (75%) and YouTube (100%) for building the brand of the wine route. It is interesting to note that Vimeo focuses more on the artistic community unlike YouTube on the mass community.

There is a website with an overview of German wine routes available (Deutsche Weine und Weinstraßen, 2020). However, this website is only in German and no brand has been created.

3.4 Austrian wine routes

The Austrian wine routes are based on the wine regions and include 5 big or 18 smaller viniculture areas. For all these regions there has been created a well-known brand Österreich Wein (2020) which presents the following wine regions: *Lower Austria* wine regions - Carnuntum, Kamptal, Kremstal, Thermenregion, Traisental, Wachau, Wagram, Weinviertel; *Burgenland* wine regions - Eisenberg, Leithaberg, Mittelburgenland, Neusiedlersee, Rosalia; *Styria* wine regions - Südsteiermark, Vulkanland Steiermark, Weststeiermark, *Vienna*, *Weinbauregion Bergland*.

A comprehensive description of all the regions and their stories, activities and events for tourists as well as lists of the wine companies in German, English, Russian and Chinese are at the website of Österreich Wein (2020) available, however, without any information on accommodation possibilities (Tab. 12).

Tab. 12: Communication strategy of Austrian wine routes

	Storytelling	Accommodation	Events	Wine companies
Communication attributes	100%	0%	100%	100%

Source: Authors` elaboration of data from Österreich Wein (2020).

The strong presence on Facebook, YouTube and Instagram supports this brand. The Austrian wine regions have been analyzed only on the webpage presence mentioned above. The Austrian Wine Marketing Board Ltd. has been operating since 1986 with the aim to strategically support, coordinate and maintain quality and sales of Austrian wines. It is co-owned by industry (50%) and local government authorities (50%). Its subsidiary is the Wine

Academy - an autonomous concern, financially independent and supported 90% by the income from the seminars it presents (Österreich Wein, 2020).

Conclusions

The digital branding of wine regions in Austria and Moravia may serve as a source of inspiration for the Slovak wine regions. A centralization of wine routes in these countries using a common brand made it possible to efficiently pool and use resources and expertise which contributed to the regional tourism and regional development. The commercial aspect and in the case of Austria also support of the local governments allowed to develop innovative marketing strategies using social media effectively.

The correlation between the sales of wine companies and the number of visitors in these regions in 2014 to 2018 was found out for the regions of Nitra and Banská Bystrica. Particularly the region of Nitra has supported the wine tourism and wine events since several years. This information may be important for the local politicians, stakeholders along the entire value chain of wine production as well as for the tourist business. Region of Nitra has achieved the highest value of wine sales among all Slovak regions for several years, e.g. in 2018 it surpassed the amount of €41 million. Nitra royal wine route actively supports the wine development in this region.

Only a low number of implemented communication solutions for websites of Slovak wine companies have been found during the research. The alarmingly low number of accommodation offers (25%) shows a considerable lack of networking activities among wine companies and hotels or guest houses. Slovak wine routes underestimate the importance of social media presence, such as Facebook, Twitter or Instagram for brand building. Twitter has not been used by any of the investigated Slovak routes. However, it is very positive, that the Slovak wine routes use a strong visual presence on the YouTube. As a part of their digital branding strategy the Slovak regional wine routes should use these innovative opportunities on a larger scale. They should respond to the changing needs and habits of the tourists by providing them up-to-date and trusted way of communication for realizing their trips effectively with better offers of events and accommodation. Monitoring the social media engagement as well as measuring the engagement rate are recommended to strengthen the branding of Slovak wine routes in the coming years. Implementation of these innovations in the digital communication may foster the competitiveness of the Slovak wine routes within Europe.

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PATH-DEPENDENCY IN PUBLICLY FUNDED R&D&I COOPERATION, THE CASE OF CZECH TIP PROGRAMME

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Abstract

Purpose:

Based on an analysis of the national TIP programme the paper examines the path-dependency effect in R&D&I collaboration within supported projects and identifies key entities, their roles and links in collaborative networks.

Design/methodology/approach:

The analysis is based on a mix of quantitative and qualitative methods. While the descriptive analysis focuses on capturing the path-dependency effect, the method of bibliometric maps is adopted to identify and visualise collaborative networks patterns. Questionnaire survey and in-depth interviews are used to understand the process of collaborative networks formation.

Findings:

R&D&I cooperation arose especially between knowledge providers and users – private firms and universities that have previously collaborated on publicly funded projects. The inter-firm collaboration remained significantly weaker, and usually occurred between firms and transformed and privatised state-owned research organisations focused on applied research. This long-term cooperation was established in the communist era and led towards the formation of technology clusters in traditional industries.

Research/practical implications:

Findings could be used by policymakers and R&D funding providers for setting more appropriate targets of R&D&I policies. The analysis provided only a static view of cooperation. Therefore, a longer period would be appropriate to understand the development of cooperation.

Originality/value:

The analysis demonstrated the long-term path-dependency effect especially in collaboration between firms and private research organisations. The novelty of this paper lies in the use of the network analysis method for identification of the key entities and links within collaborative networks, and their patterns.

Keywords: R&D&I cooperation, network analysis, R&D&I programmes, Czech Republic

JEL Codes: O31, O33, O36

Introduction

In the knowledge-based economy cooperation in research, development and innovation (R&D&I) has been recognised as a key source of innovation-based competitiveness of enterprises (Carayannis and Campbell 2012, Etzkowitz and Leydesdorff 2000). This cooperation can take various forms, of which the most important is a collaboration between knowledge users (typically firms) and knowledge producers (universities and other research organisations, including private institutions). As a driving force of economic growth, the development of cooperation is supported by national and regional instruments. The most common tool implemented by national and regional governments to stimulate and strengthen especially science-industry links are R&D&I supporting programmes (Martin & Scott, 2000).

There is a large number of studies that analyse the links between knowledge producers and users from different perspectives (for discussion see Čadil & Kostić, 2018; Marek & Blažek, 2016, Gulbrandsen et al., 2011). However, these studies are dominantly focused on highly innovative and economically most developed countries. Relatively little research has been carried out on this issue in the new EU member states with moderate innovation performance (e.g. Čadil & Kostić, 2018; Marek & Blažek, 2016, Srholec, 2015, Žížalová, 2010).

This paper contributes to the debate on the impact of R&D programmes on the development of cooperation and knowledge transfer between knowledge providers and users in the new EU member states. Using the example of the TIP programme implemented in the Czech Republic, this paper aims to shed some light on programme's contribution to the development of R&D&I cooperation of various entities. A previous study on the influence of public programmes on R&D&I cooperation in the Czech Republic dealing mainly with collaboration in large consortia established in the Competence Centres programme (Čadil & Kostić, 2019) has shown a strong path-dependency effect in R&D collaboration and distinct division of roles within the consortia. This paper examines whether this effect can be also found in significantly smaller collaborative R&D projects, and, using the network analysis, identifies key entities in collaborative networks, their roles and intensity of their links.

1. Methodology

Various approaches and methods have been employed to assess R&D cooperation and knowledge transfer among collaborating partners (Gulbrandsen et al. 2011). In this study, a combination of quantitative and qualitative methods was used to capture the complexities of this phenomenon. Quantitative methods (descriptive analysis of statistical data and network

analysis) were chosen to obtain in-depth information on the importance of collaboration in the TIP programme, identification of key subjects (knowledge providers and users) and description of the pattern of collaborative networks; while qualitative methods (a questionnaire survey and interviews) help understand how the collaborative networks are formed and the knowledge flows within the networks.

The quantitative analysis was based on project data provided by the publically available national R&D&I Information System (IS R&D&I), namely a specific part – the Central Register of Projects, which contains data on beneficiaries and funding of all projects supported from public sources since 2004.

Besides the basic descriptive analysis, a method of bibliometric maps was adopted to identify and visualise collaborative networks patterns. A distinct advantage of using this method is that bibliometric maps demonstrate the relatedness of subjects by their mutual geometric distance, thus providing more visually readable information about internal relations and relationships between individual entities. Data on the number of common projects and results were used as a starting point for the creation of these maps. Based on this data, a nodal graph was created using the VOS (visualization of similarities) clustering technique in which nodes are symbolized by circles and edges by lines between respective nodes. Each node in the map represents one entity (research organisation or business entity) and each link between these nodes (edge) expresses the relationship between the two entities. The node size indicates its weight and corresponds to the number of projects or results. The width of the edge symbolizes its weight, i.e., the number of collaborations. The position of the nodes in the plane is given, inter alia, by the number of connected edges and their weight. Nodes with a high number of connected edges are usually in the middle of a certain cluster. The proximity of the nodes on the map is an indicator of strong ties, taking into account the average strength of the relationship with other nodes within the cluster. The distances of nodes that are not connected by an edge are arbitrary.

The qualitative survey was carried out in the second half of 2018 (after the TIP programme completion). The electronic questionnaire survey was carried out among all beneficiaries (participating researchers) of the TIP programme, focused on the nature and formation of cooperation on R&D projects. In total, the questionnaire was sent to 1,745 business sector researchers, who completed 272 questionnaires; and 634 researchers from research organizations who submitted 84 questionnaires. These questionnaires covered 258 supported projects (29.7% of projects supported). A total of 8 structured interviews were conducted with principal researchers of selected projects. Criteria for selecting the researchers were as follows:

(i.) coverage of the fields with the highest volume of TIP programme funding, (ii.) coverage of industrial enterprises as well as private research organisations, (iii.) coverage of small, medium and large firms.

2.   Results

The TIP programme was implemented by the Ministry of Industry and Trade in the period of 2009-2017, and aimed to support industrial research and development enabling more rational industrial production and innovation-based competitiveness of industrial companies. In particular, the programme promoted R&D of new materials, products, technologies, information and control systems leading towards products and process innovations. The total expenditure of the programme from the state budget reached EUR 480 million, which was distributed to 707 entities, of which 631 were private enterprises (60% of supported firms were small and medium firms). Approximately 60% of the total number of supported enterprises were small and medium-sized enterprises, which received the highest targeted support overall. 120 large enterprises were also supported, which received more than a third of the support allocated to enterprises, although they accounted for only 20% of the total number of enterprises involved in the TIP programme.

2.1   Motives for the cooperation

Literature shows that R&D cooperation is motivated by many factors, of which the innovation-based competitiveness strengthening belongs to the crucial factors of private companies, while research organisations (including universities) seek to commercialise their knowledge (Čadil and Kostić 2019, Dyer et al. 2008).

Similar differences in motives of companies and research organisations were also identified in the survey. However, the most important motive for companies was access to public funds for carrying out R&D activities. This motive was significant for 93.7% of respondents. Firms assumed that the cooperation could increase the quality of projects proposals (research organisations are more experienced in project proposal elaboration), and will be positively perceived and bonified during the project proposals assessment process. The next key motives were closely connected to the development of economic competitiveness - access to knowledge and equipment of the partners (77% of respondents in total) and innovation of own products and processes (70% of companies).

Participation of research organisations in the collaborative project was primarily led by their effort to apply R&D results in praxis, which gives them the necessary feedback for targeting of further research activities. Therefore, the crucial motive for them was the

knowledge transfer (knowledge commercialisation), which was significant for 80% of respondents, followed by the development of existing cooperation (79% of respondents). Access to public funds for their own research and development activities was the third motive (75% of respondents).

2.2   The scope and types of cooperation in the TIP program

Collaborative projects have achieved considerable importance in the TIP programme (three quarters of 870 projects were collaborative projects), as Table 1 indicates. More than two-thirds of projects were carried out in cooperation of firms and research institutions, while 14% were joint projects of private companies.

Tab. 1:   Number of collaborative projects in the TIP programme

Type of collaboration	Number of projects	Share on the total number of projects
Projects solved by only one firm	208	24%
Projects solved in cooperation of two and more firms	126	14%
Projects solved in cooperation of at least one firms and at least one research organisation	584	67%
Of which:		
- Private research organisations	95	11%
- Universities	467	54%
- CAS institutes	72	8%
- Other public research institutes	21	2%
- Private non-profit organisations	7	1%
Total	**870**	**100%**

Source: IS R&D&I.

As can be further seen from Table 1, universities were the most frequent partner of enterprises. More than half of the total number of projects supported in the TIP programme was solved in cooperation with at least one university and a private company. The second most important collaborative partner from the research sector were research organisations with company status (joint-stock companies or limited liability companies). This type of partners participated in 95 joint projects (more than 10% of the total number of projects supported) A total of 72 projects were solved in cooperation of companies with the institutes of the Czech Academy of Sciences and other research institutions of the government sector (approximately 8% of projects supported).

The questionnaire survey and interviews revealed that cooperation was usually based on previous collaborative activities of the same partners funded from public programmes (65%

projects covered by the survey) or, in a lesser extent, from own company resources (17% of projects). The high importance of publicly funded previous collaboration was confirmed by project data from IS R&D&I. As can be seen from Table 2, more than 170 companies cooperated with at least one project partner in previous projects supported by another programme, and more than 80 companies already collaborated with two or more partners of the projects supported by the TIP programme. Traditional partners' cooperation results from previous good experience and the complementarity of capabilities of collaborating entities. The survey further showed that these factors were decisive in choosing the partner.

Various types of collaborative R&D were carried out in supported projects, as the questionnaire survey revealed. The most frequent type was the joint research and development, in which the knowledge and R&D capacities were shared by collaborating entities (78.2% of respondents). The next most frequent activity was testing and verification, which was carried out in 51% of projects. Nevertheless, interviews showed that this type of R&D cooperation was the most common. This activity was typical for technical universities because they have required laboratory facilities and the relevant methodologies. The further type – consultancy – was carried out in 40% of projects covered by the survey. For most projects, several types of R&D activities were carried out simultaneously.

Tab. 2: Number of companies that have cooperated with at least one project partner in previous publicly funded projects completed a year before the start of TIP projects

Companies collaborating with the same project partners in previous projects	Number	Share
Companies collaborating with at least 1 partner	172	27%
Companies collaborating with at least 2 partners	84	13%
Companies collaborating with at least 3 partners	47	7%
Companies collaborating with at least 4 and more partners	27	4%
Total number of companies in the TIP programme	**631**	**100%**

Source: IS R&D&I.

2.3   Maps of collaboration

The network analysis was applied to the two most frequent types of cooperation (university - company, and company-company). Maps of collaboration for both types are displayed in Figures 1 and 2. Figure 1 shows a collaboration pattern of university-company links. What stands out in the figure is a strong position of several faculties of technical universities – mainly VUT - Faculty of Mechanical Engineering, CTU - Faculty of Mechanical Engineering, VUT - Faculty of Electrical Engineering and Communication and VŠB TUO - Faculty of Metallurgy

and Materials Engineering. Due to their broad specialisation in many research fields and their knowledge stock, capabilities and laboratory facilities, universities cooperate with a wide range of different companies and play the role of knowledge providers. Figure 1 also shows that links among the faculties are relatively weak, and companies dominantly cooperate with the faculties, then among themselves.

The relatively weak inter-company collaboration intensity also confirms Figure 2 displaying collaborative pattern only for company-company relation. Surprisingly, cooperation is low even in progressive, knowledge-intensive and fast-growing industries This interesting finding could be attributed to the low number of companies in these industries and the absence of private research institutions, which could act as knowledge providers.

Knowledge providers are again the key parts of collaborative networks, as can be further seen from Figure 2. What is interesting about the cooperation network pattern displayed in the figure is the formation of several larger clusters, with the central position of knowledge providers (private research institutions). The following clusters can be identified:

- Aviation - companies around the Research and Test Institute of Aviation a.s .;
- Metallic materials - companies around COMTES FHT a.s .;
- Energy - companies around the Institute of Applied Mechanics Brno s.r.o .;
- Surface treatment - companies around SYNPO a.s .;
- Nuclear energy - companies around ÚJV Řež a.s. and the Research and Testing Institute Plzeň s.r.o .;
- Organic Chemistry - companies around Research Institute of Organic Syntheses a.s .;
- Geology - companies around Arcadis Czech Republic s.r.o .;
- Inorganic Chemistry - companies around the Research Institute of Inorganic Chemistry a.s .;
- Machine tools and production machines - companies around VUTS a.s.

The research institutions in the centres of the clusters are mostly privatized and transformed former state research institutes that traditionally cooperated with enterprises. Companies cooperating with these institutions are usually traditional manufacturing enterprises with long-term history. This cooperation within the clusters is in most cases the long-term traditional collaboration, which was established under the period of socialism.

Figure 2 also shows that many companies were integrated into the clusters through only one project. This could be caused by the low number of projects of these firms.

Fig. 1: Map of the university-company cooperation
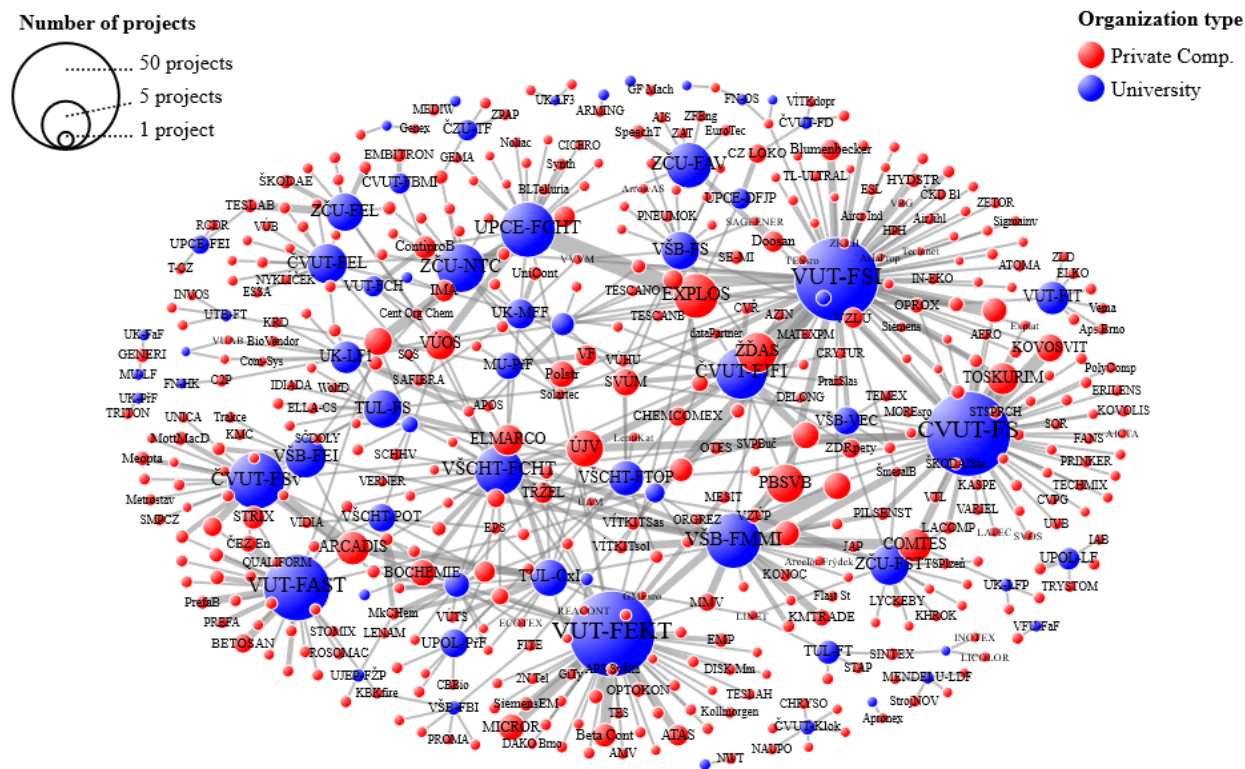
Source: IS R&D&I.

Table 3 demonstrates the importance of the clusters within the TIP programme. Approximately 23% of all entities participating in the TIP programme were involved in clusters. These entities solved 291 projects, about 33% of projects supported by the TIP programme. Their total expenditures amounted to roughly 38% of the total programme expenditures.

Fig. 2: Map of the inter-firm cooperation
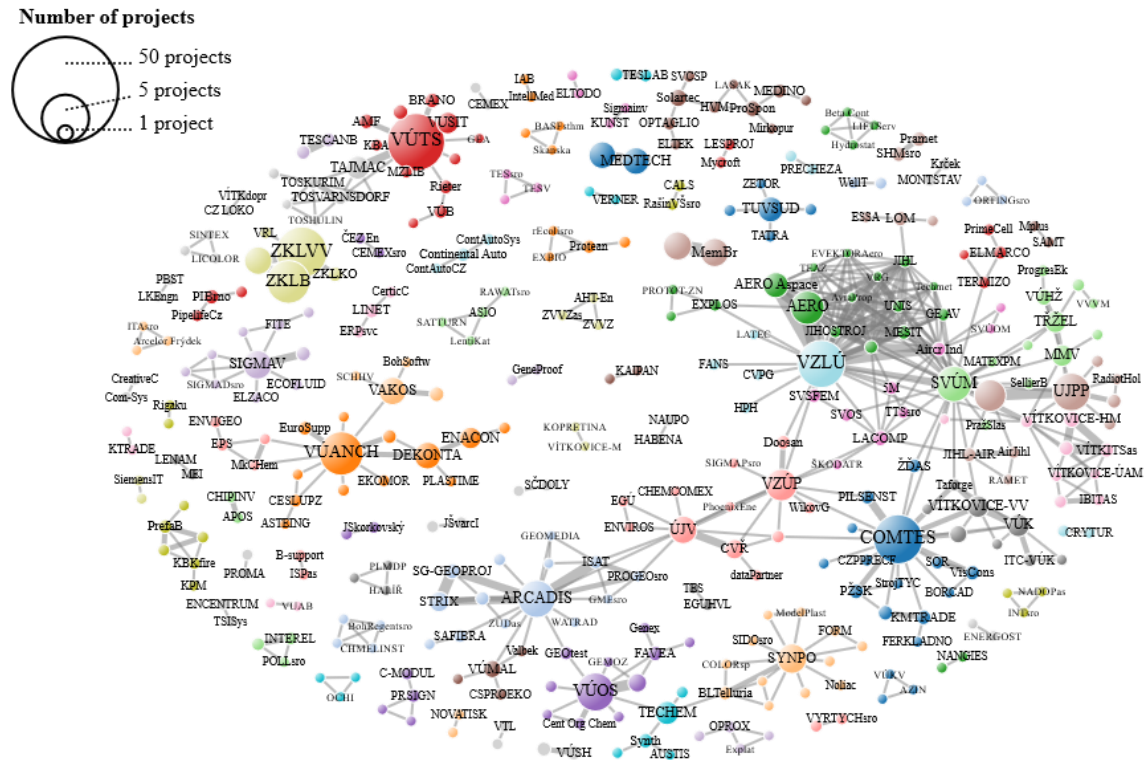
Source: IS R&D&I.

Tab. 3: Importance of clusters within the TIP programme.

Cluster	Institutions		Projects		Total expenditures	State support
	Number	%	Number	%	%	%
Inorganic Chemistry	21	2.97	34	3.91	2.44	2.68
Energy	9	1.27	14	1.61	1.51	1.36
Geology	18	2.55	25	2.87	2.75	2.82
Nuclear energy	12	1.70	30	3.45	6.22	5.85
Metallic materials	21	2.97	37	4.25	3.74	3.94
Aviation	33	4.67	67	7.70	12.56	10.91
Machine tools and production machines	19	2.69	40	4.60	6.93	5.95
Organic Chemistry	15	2.12	29	3.33	1.69	1.61
Surface treatment	13	1.84	15	1.72	0.94	0.96
Clusters total	161	22.80	291	33.45	38.76	36.09
TIP total	706	100.00	870	100.00	100.00	100.00

Source: IS R&D&I.

The development of R&D cooperation can be also analysed according to common outputs achieved in the collaborative projects. Since the TIP programme was focused on applied R&D, the key outputs were utility models, patents, technologies, software or methodologies. Surprisingly, common outputs rather indicate the weak collaboration intensity, as 88% of the

above-mentioned outputs were generated by individual entities. Approximately 10% of the outputs were created in cooperation of enterprises and research organisations. Only 2% of the outputs made created in cooperation of more than two companies. The small proportion of common outputs can be explained by the role of individual partners within the consortium, the distribution of intellectual property rights, and different motives of firms and universities to create various kinds of outputs. While firms aimed at aforementioned outputs, universities concentrated rather on publications.

Conclusion

The results are consistent with the earlier assumption on the path-dependency effect in R&D cooperation and with previous studies dealing with publicly funded R&D collaboration in the Czech Republic. Network analysis identified patterns of cooperation networks, the key entities within the networks including variously intense links among different types of entities. The analysis also showed a clear division of roles in projects into knowledge providers (universities and research organisations) and knowledge users (companies). This collaborative pattern confirms the previous finding of Marek and Blažek (2016) that the cooperation is driven by the need to supplement the existing know-how of collaborative companies, to gain access to specific laboratory equipment, or, in the worst cases, to only formally meet the programme criteria. For enterprises, the most attractive partners were faculties of technical universities, in particular ČVUT (Czech Technical University in Prague) and VUT (Brno University of Technology), in specialized fields VŠB-TUO (VSB-Technical University of Ostrava), UPCE (the University of Pardubice) and ZČU (the University of West Bohemia). This is consistent with conclusions of some previous papers (e.g. Žížalová 2010) that regional universities focus primarily on education than on R&D.

One of the most significant findings to emerge from the analysis is that collaborating companies, and especially collaboration between companies (knowledge users) and private research organisations (knowledge providers) formed specific clusters, which are centred around transformed research organisations and can be described based on technology or industry. Therefore, it seems that cooperation is likely to be long-term and based rather on good personal relations and experiences than on economic (commercial) relations. The cooperation is maintained by public funds (programmes); each project leads to its reproduction or some modifications.

The paper also demonstrated the use of network analysis for identification of key entities and links within collaborative networks and their patterns. However, several limitations to this

paper need to be acknowledged. First of all, the generalisability of the findings is limited by the fact that only one programme was analysed. Besides, the lack of appropriate data did not allow to analyse the private-funded cooperation (the R&D&I Information System contains only data on projects financed from public sources). However, interviews with representatives of enterprises supported in the TIP and Competence Centres programmes revealed that research cooperation often depended on obtaining public funds (Čadil and Kostić 2018, 2019).

Another issue that was not addressed in this paper was the geographical proximity of collaborative partners. Although the geographic location was not considered in the network analysis, collaborative networks show that technological proximity and R&D capabilities were more relevant to the formation of cooperative consortia. In addition, Žížalová (2010) found that even though co-location and intra-regional knowledge and innovation collaboration existed, the geographical proximity was not a crucial condition in knowledge and innovation collaboration. Similarly, Marek and Blažek (2016) show that physical distance of collaborative partners plays the secondary role, while the more important is the position of the city, where the partners are located, in the settlement hierarchy and the related concentration, quality and specialisation of R&D.

Finally, some specific firm-level characteristics (e.g. ownership structure, size or technological field) were not taken into account in the analysis, although their different effects on the consortia formation could be assumed, as e.g. Rothaermel and Boeker (2008) and Sakakibara (2002) proved.

All these limitations should be a subject of further research focused on the importance of factors behind R&D collaboration.

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MANAGERIAL COMMUNICATION OF FLEXIBLE WORKING CONDITIONS AS OFFERED IN SMES IN SOUTH BOHEMIA

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Abstract

Purpose: Flexible working conditions (FWC) are rarely used in the Czech Republic. The reason for writing this paper is to find the answers to the following questions: How do service providing SMEs inform their employees about the offer of FWC? Do managers communicate FWC transparently and utilize the potential of this offer? The main purpose of the research is to show an opportunity to retain and recruit employees and to innovate HR management.

Design/methodology/approach: The data were gathered in the framework of the research that was carried out from November 2018 till October 2019. A questionnaire survey was carried out in 100 SMEs providing services in South Bohemia. Chi-square discrete character independence tests were used to analyse the questionnaire results.

Findings: Although 28% of SMEs surveyed perceive the FWC as the possibility of attracting qualified employees, only 14% of the respondents reported a transparent manner in which the FWC are offered to employees. The correlation between the level of education of the manager and the way of informing employees about the FWC was shown.

Research/practical implications: The employers who are willing to provide their employees with the FWC do not make sufficient use of the communication potential that such possibility offers. The data will also be used in research of management of parental leave in the SMEs. The aim of this research will be to draw the attention of SMEs to the possibility of recruiting skilled workers who lose contact with the labour market during years of the parental leave and contribute to effective management of maternity leave.

Originality/value: The originality of the paper is related to the view of FWC in the SMEs through the prism of managerial communication. The research revealed that managerial communication regarding the FWC in SMEs might be improved to enrich the situation of SMEs in terms of human resource management and social sustainability.

Keywords: flexible working conditions, managerial communication, small and medium-sized enterprises, part time, home office

JEL Codes: J21, L20, M10

Introduction

This paper deals with the communication of managers in small and medium-sized enterprises (SMEs) providing services. The SMEs are the backbone of the Czech economy as Dvouletý (2019) says. They are very often self-employed individuals. However 24% of them were the legal entities, i.e. business companies in 2017. In SMEs, communication plays a very important role in many respects.

Flexible working conditions (FWC) are rarely used in the Czech Republic, however over time the number of flexible jobs increases. A very similar situation is reported in the other Visegrad Countries. The share of the part-time employment only reached 6.2% in the Czech Republic in 2018 (Eurostat, 2020) compared to 4.2% in Hungary, 6.2% in Poland and 4.8% in Slovakia. To the contrary, in Germany it was 26.8%, 27.6% in Austria and 46.8% in the Netherlands.

Mura (2017) recommends appealing to creating more flexible labour law in the Visegrad countries as one of the tools of human resources management. Milosevic et al. (2019) researched the reasons for the factors of the failure of the SMEs in the Czech Republic, Slovakia, Hungary and the Republic of Serbia. One of the reasons was the lack of management attention to human resource management. As Michoń (2015) shows, the parents in the Visegrad countries have long parental leave paid by the governments and they do not have incentives enough to be employed during the parental leave. If there are not enough FWC they are not able to participate in the labour market. The mothers in the Visegrad countries stay at home many years with their children, they lose their qualification and then they suffer by gender pay gap.

The enterprises in the Czech Republic, including the SMEs, are currently facing a shortage of skilled workers. The analysis of the Czech Statistical Office (CZSO) of 29th October 2019 states that: the total average unemployment rate of EU states in the second quarter of 2019 was 6.3%, reaching the lowest level in the period under review (since 2005) (Czech Statistical Office, 2019).

Among the EU countries, the unemployment rate in the Czech Republic was significantly lower in Q2 2019. In the Czech Republic, the unemployment rate in the period was the lowest, with the total unemployment rate in the Czech Republic reaching 1.9% in the period. The CZSO (2019) also states in the analysis that Sweden still has the highest female employment rate, which was 80.9% the quarter. In the Czech Republic, the employment rate for women was 72.4%. For an analysis comparing the employment rate for women in Sweden and the Czech

Republic, the analysis works with the age group of the population aged 20-64. As the statistics described above show, Sweden makes intensive use of female work capacity.

Estes (2016) describes the benefits of flexible jobs for workers. In particular, it is easier to reconcile family care and employment. This motivates mothers to remain in the labour market (in the US where low state support is provided, only 68% of mothers of pre-school children remain on the labour market, while in Sweden, where the government programme financially supports FWC. When there is state support for flexible jobs, women tend to work in positions of higher influence, earn more money and have more influence at work and at home. Without the existence of FWC state support, women prefer staying at home to take care of the family and get financial support from their husbands.

According to Eurostat data (2019), women with a child under 6 years of age showed an employment rate of 70.5% in the Czech Republic in 2018, while in Sweden the same group of women had an employment rate of 87.1%, in Slovenia it was 87.6%, and 84.1%. in the Netherlands. The average employment rate of this group of women in the EU-28 was 75.7% in 2018, with only Italy (69%), Hungary (64.9%), Slovakia (64.3%), Montenegro (61.4%), North Macedonia (57.0%), Serbia (68.3%), Turkey (57.4%) showing lower employment rates for this group of women than the Czech Republic.

Pertold-Gebicka et al. (2016) show that the women after the birth of their first child prefer working in the public sector. They switch from the private sector to the public sector because of the time pressure and convexity of pay. It is clear from the above mentioned that women are addressing the conflict between the time needed for childcare and employment. FWCs are one of the tools to ensure that skilled workers remain in SMEs also post first child birth.

In the Czech Republic, the parents have the opportunity to receive child benefits up to the age of four years. During receiving such support, the vast majority of parents take parental leave. However, while receiving the benefit, the legislation does not prevent parents from entering employment. One of the roles of managers is currently to attract more workers to the labour market. The enterprises can look for potential active employees between the parents receiving child benefits. To do so, however, the workers need to be able to use the FWC to enable them to combine family care with employment. Ordinary working conditions are also confronted with the onset of the Generation Y, meaning the people who are characterized by a greater appetite for autonomy, meaningfulness of work, a desire for more time flexibility, a desire to devote time both to their career and the family and leisure, as noticed by Career Web (2009).

The term FWC is not enshrined in Czech legislation. The following FWCs were analysed in the research: shorter working hours, flexible working hours and tele-working. These are forms of work used in a low extent in the Czech Republic so far, although current legislation does not prohibit their use. According to Eurostat data (2016), only 6.7% of jobs in the Czech Republic were part-time in 2016, while in the EU the share of part-time jobs in total jobs in the same period was 20.4%.

CZSO (2018) said that the number of part-time workers significantly increased. Their share increased to 7.6% of all workers, however, in the international comparison it is a very low figure compared to Germany and Austria, where it is 28-29%, so still a very small share.

The research was carried out among the SMEs providing services and education. As reported by Bednářová and Škodová (2010), the SMEs are very important for the healthy functioning of the economy. Without the entrepreneurs, a market economy is not possible. The basic characteristics of SMEs include, as the authors report, that workers have practical knowledge but they lack theoretical knowledge. They have few opportunities for internal and external in-service training. The lack of opportunities for internal and external education is closely related to unsystematic personal and career development, including communication on the needs of the FWC, as evidenced by the present research. Although the FWC's share of total workloads in the Czech Republic is increasing, the research in the paper revealed that it is not a standard for service-providing SMEs to communicate with their employees about the possibility of using the FWC transparently. The results of the research in the paper are connected to a research in which Hari (2016) found that the rules of the work-life balance programme offered by Canadian ICT companies were generally not published on the website and the specific agreement was left to a discreet agreement between a manager and a worker. Often, no formal standard or precedent was established to lay down rules that the workers can count on. This in turn led to the deterioration of collective relations, workers' worries about whether they would be allowed the same working conditions as their colleagues, etc.

As reported by study of Fursman, Zodgekar (2009), 27% of women surveyed would feel nervous if they asked employers for flexibility, based on concerns that co-workers would have to work harder and that their careers would grow more slowly. Many feared that they would be accused of lack of fidelity to their profession if they asked for flexibility.

In the research of Březinová and Holátová (2014) the managers in the area of human resources management were interviewed among the SMEs in South Bohemia. The weaknesses most often included the area of communication with the employees. If managers want to be really good, they have to achieve effective communication in the enterprise.

1.   Methods

The questionnaire survey was carried out from November 2018 till October 2019 among the employers working in the services and education sector, employing at least two employees and a maximum of 250 employees. The questionnaires were available to the participants through the Survio online platform. The questionnaires were filled in by the managers of the organisations, in charge of HR management and communication within the organisation. The managers were contacted directly by the interviewer, who informed them about the meaning and existence of the questionnaires and asked them to answer responsibly. The interviewers deliberately addressed organisations working in the services and education sectors.

The questionnaire included an indication of the size of the organisation and business sector to confirm that the interviewers appropriately selected the target group for the questionnaire survey. Only the questionnaires that were completed by organisations with 2-250 employees working in the services and education sectors were analysed. The obtained data were exported from the Survio platform to MS Excel and subsequently to the R programming environment.

There were 100 respondents. 53 of them were micro-sized and 47 were medium-sized employers. 72 of the respondents were from South Bohemia and the rest of the respondents were from the neighbour regions and they often employed people living in South Bohemia. Based on statistics of Ministry of Industry and Trade ČR (2020) there were total 143,286 enterprises in the South Bohemia the IV.Q 2019. Czech Statistical Office (2020) informs that in services and education realize ca. 60% of all organisations. In South Bohemia in 2016 there were 9.2% enterprises employing 1-249 employers (there are no newer dates) (Czech Statistical Office, 2016). Organisations in sample were ca. 143,286 x 0.6 x 0.092 = 7,909. Response rate is ca. 1.3 % (100/7,909).

The data were analysed using the Chi-square independence test. The dependencies were analysed for four variables: 1) FWC offer method, 2) points for the jobs with FWC, 3) Manager education, 4) FWC awareness of attracting qualified female workers to employment.

Number of valid observations = 100. Number of characters = 4. The significance level for all tests was $\alpha = 0.05$. The research question: Is there a dependency between the variables? The following applies to all tests: H0: A and B do not show a dependency; Ha: A and B show a dependency.

2. Results

2.1 Use of FWC in SMEs

The participants answered the following questions: 1) How many of your employees have the possibility to work part-time (less than 40 hours per week under a contract or an agreement to perform work - not an agreement to perform job or subcontract)? 2) How many of your employees have the opportunity to work from home on certain days? 3) How many of your employees have the opportunity to work in the time of their choice (any beginning and end of the shift, any interruption of work)?

The managers answered all the above mentioned questions by choosing one of the following options: 1) nobody, 2) 1-5% of the employees, 3) 6-10% of the employees, 4) 11- 30% of the employees, 5) 31-50% of the employees, 6) more than 50% of the employees. The answers of 100 respondents are summarized in Table 1.

Tab. 1: Use of FWC in SMEs

The employees using FWC (in %)	The number of organisations offering the kind of FWC (max. 100)		
	Part time	Home-office	Flexitime
0	24	41	27
1-5	18	20	22
6-10	13	10	6
11-30	10	8	7
31-50	13	6	13
51-100	22	15	25

Source: Authors.

The questions concerning the use of the FWC were not intended to analyse the intensity offered by the FWC, but to provide a basis for determining whether the FWC offered by the employer would be taken into account in the way the FWC offer was communicated. For this purpose, the result data were converted into the scores of the participants.

For each level of employee share using the FWC, a following point scale was used: nobody = 0 points, 1-5% of employees = 1 point, 6-10% of employees = 2 points, 11-30% of employees = 3 points, 31-50% of employees = 4 points, more than 50% of employees = 5 points. The participants were assigned a score in which the points for all three of the above FWC were added up. This score was then transferred to the R programming environment in which a set of chi-square independence tests was performed.

2.2 FWC as a tool to attract qualified female employees taking care of their family

The participants answered the following question: Which benefits of flexible jobs do you consider beneficial in your organisation? They chose from several choices, and they could choose as many choices as appropriate. One possibility was: attracting qualified female employees. This answer was chosen by 28 respondents, regardless of whether and what proportion of FWC they offer.

2.3 Method of reporting on the possibility of using the FWC

The participants answered the following question: How are your employees informed about the possibility of using FWC (part-time, home office, flexible start and end of working hours)? They chose the answer from the options offered, and could choose as many options as appropriate. Answers offered: 1) communication on the company's website and on the intranet, 2) individual communication during the interview with the employee, 3) specified in the manual/directive applicable to all employees, 4) other.

The answers do not depend on whether and in what proportion the FWC are offered to the employees. The employees can be informed both about the fact that they have the opportunity to use the FWC, and about the fact that they do not have the opportunity to use the FWC. As a transparent way of informing, the following responses were included in further research: 1) Communication on the company and intranet website, 2) Specified in a manual/ directive applicable to all employees. Under the answer "other" the participants stated that employees are not informed about the use of FWC in any way. It was found that only four organisations report the possibility of using FWC on the company's website and intranet; ten organisations inform through a handbook/directive applicable to all employees; 83 organisations report the opportunity to use the FWC individually in an interview with an employee; and 3 organisations do not report on the FWC at all.

2.4 Education of the manager

The managers who completed the questionnaire have the ability to influence the existence of the FWC in the organisation and they have the opportunity to influence the way the FWC is communicated. The research examined whether the education of the managers affects how the employees are informed about the FWC offer. The participants answered the following question: education of the participant. The following options were offered: 1) University and higher, 2) Secondary school, vocational college 3) Vocational school, 4) Primary education.

There were 52 managers of university education and higher, 39 with secondary education or vocational college, 9 managers with vocational education and no one with primary education.

2.5 Dependency

The data were analysed using the Chi-square independence test. The dependencies were analysed for four variables: 1) FWC offer method, 2) points for the jobs with FWC, 3) Manager education, 4) FWC awareness of attracting qualified female workers to employment.

The dependence was proved between ad 1) and ad 3); with value of test statistic of $\chi2 = 16.656$. Another demonstrable dependence is between ad 1) and ad 2) where the value of test statistic is $\chi2 = 49.484$. No dependence was found between ad 2) and ad 3), where the test statistic value is $\chi2 = 35.483$. It is quite surprising to find that there is no demonstrable dependence between ad 4) and none of the other observed features. Test statistics values for the tests are as follows: $\chi2 = 0.02022$ for ad 4) and ad 1); $\chi2 = 19.669$ for ad 4) and ad 2) and $\chi2 = 0.16831$ for ad 4) and ad 3). Table 4 shows the dependencies of each variable and the p-value of each test.

Tab. 2: Dependencies of the variables

Variable	Chi-square test dependence (p-value)			
	Variable ad 1)	**Variable ad 2)**	**Variable ad 3)**	**Variable ad 4)**
Variable ad 1)		Dependency proved (0.00738)	Dependency proved (0.00225)	Dependency not proved (0.99)
Variable ad 2)	Dependency proved (0.00738)		Dependency not proved (0.156)	Dependency not proved (0.141)
Variable ad 3)	Dependency proved (0.00225)	Dependency not proved (0.156)		Dependency not proved (0.919)
Variable ad 4)	Dependency not proved(0.99)	Dependency not proved (0.141)	Dependency not proved (0.919)	

Source: Author.

3. Discussion and Conclusion

Can we use more transparent managerial communication about flexible working conditions (FWC) offer in practice? Might it help to retain employees who take care about family? Has it a potential to hire more employees? The answer is "yes". It is not a general factor of success, but it is a small step helping to better work-life balance which is very important for mothers and for generation Y. There are some arguments again, e.g. more administration and tied rules, which talks again transparent communication by web sites or by manual. But organisations

have the possibility to make the rules simple and transparent. Such transparent communication helps to openness and credibility in company culture. Employees will feel more safely and it is positive for the retaining of employees and building a good employer´s mark.

It was found that only 14% of the organisations surveyed report the employees transparently on the possibility of the FWC. The way in which an organisation informs its employees about the possibility of using the FWC depends on whether and in what proportion the FWC is available to its employees, and does not depend on their understanding that the FWC can be a tool to attract qualified female employees taking care of the family. It also depends on the education of the manager. Managers with vocational education do not, in any case, inform their employees transparently of the possibility of using the FWC, despite the fact that FWCs are offered in their enterprise.

No dependence was proved between awareness of FWC benefits and managers' education, and the way they report the FWC offers. Such finding indicates that the managers are not responding to the benefits of the FWC, although they are aware of them. Although 31% of the organisations involved in the questionnaire survey earned a FWC score of at least 5 points, so that offer FWCs to their employees to a significant extent, it is not a standard for them to communicate transparently about such possibility and therefore their employees cannot anticipate whether they will be able to use the FWC. There is great potential for improvement in the area of managerial communication about the FWCs in the SMEs providing services in the Czech Republic.

Acknowledgement

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PATENT FAMILIES IN TECHNOLOGY INTELLIGENCE PROCESSES

Jan Černý – Martin Potančok

Abstract

Purpose: Patent families play their most important role when considering the extension of legal protection for particular inventions to different territories. There are a number of conceptual approaches for different intellectual property institutions. Thus, the aim of this paper is to demonstrate how to use patent family data for Technology Intelligence processes and the related sub-processes.

Design/methodology/approach: We have analyzed the patent application structure and identified particular bibliographical entities to introduce patent applications as rich-structured and quality data. We have chosen to analyze patent family data records that are operated by the European Patent Office, particularly the Global Patent Index (GPI), to show possible analysis outputs. Our approach has been focused on the application of patent family data as one of the crucial sources for establishing an early warning system when it is considered as a key intelligence topic.

Findings: We have defined the generalized patent application structure, then identified the patent family concepts and their possible use for particular technology intelligence sub-processes following patent data collection possibilities within the Global Patent Index, part of which is the EPO DOCDB database — the most significant bibliographic patent source.

Research/practical implications: This method could be used in any industry, or when a competitive technology intelligence analysis of the key market technology player is requested. R&D managers, researchers and scientific community could also use it for state-of-the-art analysis verification, and decision-makers can support their investment strategy.

Originality/value: Patent family concepts must be considered as one of the crucial sources when validating or discovering state-of-the-art and possible technology trends together with relationships between private companies, institutions and academia. We have put patent family data analysis possibilities in the context of intelligence business processes and shown their possible role in an early warning technology intelligence system.

Keywords: patent data, patent families, technology intelligence, search strategy

JEL Codes: C80, D80, O30

Introduction

Patent families play their most important role when considering the extension of legal protection for particular inventions to different territories. There are a number of conceptual approaches for different intellectual property institutions. For example, Dernis and Khan (2004) defined a patent family *"as a set of patents (originating from the priority filing) taken in various countries (i.e. patent offices) to protect the same invention"*. EPO (2016) considers a patent family as *"a collection of patent applications covering the same or similar technical content"*. Last, but not least, WIPO (2013) sees a patent family as *"a collection of published patent documents relating to the same invention, or to several inventions sharing a common aspect, that are published at different times in the same country or published in different countries or regions"*. These features of patent family concepts are very important for the technology intelligence process, especially for R&D innovation activities, production processes and market strategies. For example, Ardito et al. (2018) have demonstrated how significant patent family data could be when mapping innovation dynamics focused on the Internet of Things domain specially with a practical application perspective. Patent families also show emerging global technology trends. Paulraj et al. (2018) have used patent family data to explore biomedical application trends. Moreover, patent families as Kim et al. (2018) presented, are also an important metric of an intellectual property protection level especially useful when measuring a market value of companies. From the point of view of the Technology Intelligence process we can distinguish the following intelligence phases: *planning* (defining key intelligence questions and business technical information needs), *collection* (selecting relevant information sources and using optimal search methods to mine relevant data and information), *analysis* (seeking a context between collected data and information), *distribution* (delivering the analysis conclusions to decision-makers). As one of the key information sources, patent families provide not only scope for the geographical protection of intellectual property, but unique business insights. However, patent information is still underestimated. For example, according to a survey among Czech companies only 8% of respondents used patent sources for competitive intelligence purposes (Molnár et al., 2015). This paper is therefore focused on demonstrating the advantages that patent technology intelligence analysis brings. Firstly, we have analyzed the patent application structure and identified particular bibliographical entities to introduce patent applications as rich-structured and quality data. Secondly, we have chosen to analyze patent family data records that are operated by the European Patent Office, and particularly the Global Patent Index (GPI), to show possible analysis outputs.

1.   Patent Data

1.1   Patent Data Structure

Patent applications have different data structures in particular offices, but obviously they are published with common compulsory information such as inventors, title, abstracts, etc. We have summed up this information within a generalized patent data field structure followed by a description of function and meaning: Identification numbers provide particular information about regional patent protection extent followed by a specific number series. We can distinguish between intellectual property offices having an annual numbering system and offices having something other than an annual numbering system (WIPO, 2005). We can monitor the date of filing, or priorities in the first case followed by characters, or number strings representing e.g. the legal status of a particular application, or office internal numbering. The second system is defined by a specific office numbering rule. Generally, we can see three unique identification numbers in the numbering systems: application number (given when filing the application), publication number (given when the application are published) and grant, or patent number (given when the patent is granted). Furthermore, if we analyze a patent family set by multiple patent applications we must consider country-to-country differentiation of application numbering systems. In summary, patent family identification number analysis leads to the extent of regional protection, legal status (e.g. if granted or not), and following possible market penetration through the years of filing, and possibly granting of a specific invention. Name bibliographic fields provide the identification of inventors, applicants (patent owners) and their representatives. Moreover, these entities should be considered when analyzing patent families with the purpose of uncovering possible business relationships or partnerships. Regarding content bibliographic fields, we have focused on application titles, abstracts, claims and descriptions. The problem of filed application is a vague formal language leading to difficulties regarding patent content analysis. This could be partly solved by text clustering or using classification schemes. When analyzing patent family from a content perspective we can uncover a specific part of a particular invention used in a completely different technical solution (an extended patent family). Classification bibliographic fields are important when a specific industry, or a specific technology innovation development analysis is requested. There are two main classification systems widely used in patent data records: the first International Patent Classification, yearly updated scheme that consists of eight technology areas, and the second Cooperative Patent Classification operated by the European Patent Office and the United States Patent and Trademark Office. This scheme also consists of eight technology sections, but there is a ninth class covering new technology developments that cannot be inserted to any of the main sections. More about these particular classifications is

discussed by Černý (2017), EPO (2019), WIPO (2016) and WIPO (2015). We need to consider classifications when analyzing the technology scope among particular patent families, especially when comparing the individual classes.

1.2   Patent Family Concepts

Patent families are not created by intellectual property offices but by database providers. This leads to concept differentiations. Each of the following concepts analyzed is completed by the possible intelligence usage. Concepts from Khan and Dernis (2010), Dernis and Khan (2004), Lupu et al. (2011), Mailänder (2017), EPO (2016), Martinez (2010) and WIPO (2013) were analyzed. Table 1 below defines the most used patent family concepts. The authors have included the possible concept usage in technology intelligence processes. We should add that patent families are not constituted by patent offices, or they are not anchored in patent laws throughout different jurisdictions, but come from different established data sources. From this perspective, we need to understand a data source typology, and then be able to mine a specific data source with patent family records. In essence, we distinguish between freely available patent information sources and commercial systems with national, regional and worldwide coverage. The increase in availability of patent documents for the general public due to massive digitalization can be monitored from the indexes of the EPO espacenet, or the WIPO Patentscope as publicly free world information source examples; national patent offices have also been providing significantly more complex search systems (e,g, USPTO, DEPATISnet). Even with these positive developments, free sources cannot provide relevant patent results and analyses to ordinary users because of several limitations. Firstly, the data quality varies together with search possibilities. Typically, development countries operate a basic search interface with limited search options (e.g. Albania, Montenegro, Mongolia, Venezuela, or Belarus). This statement is also valid for regional institutions such as the African Regional Intellectual Property Organization (ARIPO), Organisation Africaine de la Propriété Intellectuelle (OAPI), or Council for the Arab States of The Gulf (GCC). For example, GCC only provides periodically issued electronic gazettes. This disparate quality dramatically increases the risk of infringement of relevant document avoidance, especially for R&D managers who lack search abilities. But even the sources with international coverage present a difficult search environment, namely search result number limitation and advanced search syntax leading to hard-to-reach patent family members. The commercial source spectrum, of course, provides value-added features including, among other things, advanced state-of-the-art analysis, title and abstract text analysis, alert services, etc. But there are complex requirements for searchers regarding their intellectual and search ability capacity. For these reasons, patent family data are hard-to-reach data entities, especially in the case of artificial, or national patent families.

Tab. 1: Patent Family Concepts

Patent Family Concepts	Technology Intelligence Use
Simple Patent Family Patent documents that are protecting the same technical solutions. Or, all patent documents that have the one common priority, or priorities.	Territorial protection extension analysis, possible market penetration strategies, legal impact.
Extended patent families Patent documents that connect the similar technology but it is not necessarily the same one. One priority must be in common together with at least one other member. This type of family is provided by the EPO INPADOC database.	Product portfolio development, industry coverage, territoriality, inventor network analysis and technology trends.
Triadic patent families A set of patent documents filed in the EPO, USPTO and JPO that share at least one, or more priorities.	The members of this type of family is being considered as protector of significant inventions, or innovations.
Domestic patent families Patent documents in one and only territory that are connected to the first filling, and subsequently consists of new procedural steps, original document add-ons, etc.	Get knowledge about legal statuses and procedural development of one particular invention of a specific company.
National patent families Patent documents on the national level that are relating to the same invention, or inventions with at least two members of the family are distinct from each other and have at least one originating document in common (additions, continuations, etc.).	Monitoring of developments of an invention, and innovations (product) of a particular company within one specific market. Relies heavily of a national office data and information sources knowledge and strongly support local market intelligence.
Novelty-based families Patent families that uncover the latest technology trends. Data and information about these families are provided by the commercial vendors.	Supporting the R&D management decision-making process when planning further research scope and new developments or broadening a product portfolio.
Artificial patent families The relating patent documents that were subsequently filed at the different patent offices, but at least one of the members of this family has no originating priority (e.g. the filling after 12 month period of a priority right)	Useful for detailed investigation of a protection extension, especially when considering local, or national intellectual property strategy.

Source: Authors based on studies from Khan and Dernis (2010), Dernis and Khan (2004), Lupu et al. (2011), Mailänder (2017), EPO (2016), Martinez (2010) and WIPO (2013).

1.3   Technology Intelligence Patent Entity Concept

Technology information signals have been discussed in the context of many intelligence analyses within particular industries. For example Zhang et al. (2016), Rafols et al. (2010), Porter (2005) and Porter and Cunningham (2005) provided the concept of technology mining from the perspective of external environment analysis, thereby revealing possible R&D factors affecting innovation activity level, and commercial factors. Furthermore, Lee et al., 2009a have shown how patent analysis can provide crucial outputs for monitoring technology capabilities and supporting technology road-mapping as an important strategic innovation management tool. Solid patent document structure and their rich content perspective also provide great analysis potential directed towards seizing new emerging trends as Lee et al., 2009b have demonstrated. While this paper is focused on patent families and their role within the competitive technology intelligence process, we have defined the following intelligence subprocesses when analyzing strategic business needs:

1) **Technology information needs**

    Strictly defined technology intelligence topics are crucial points when considering collection preparations. Strategic management determines *key intelligence topics (KIT)* further split into individual *key intelligence questions (KIQ).* The intelligence analyst the defines special *information tasks* and *requests.*

2) **Early Warnings Definitions**

    As one of the key intelligence topics, *early warnings* within a specific technology scope could connect to business entity relations, individual relations, possible business leads, intellectual property territoriality and similar signals.

3) **Patent Family Data Analysis**

    Patent family datasets could provide one of the important sources that consist of important characteristics such as regular update frequency, possible content-contextual and legal data analysis.

4) **Intelligence Dissemination Results**

    Patent family intelligence analysis bring unique and factual business insights and could be delivered within an optimal structure together with possible real-world business events.

Fig. 1: Patent Family Technology Intelligence Subprocess
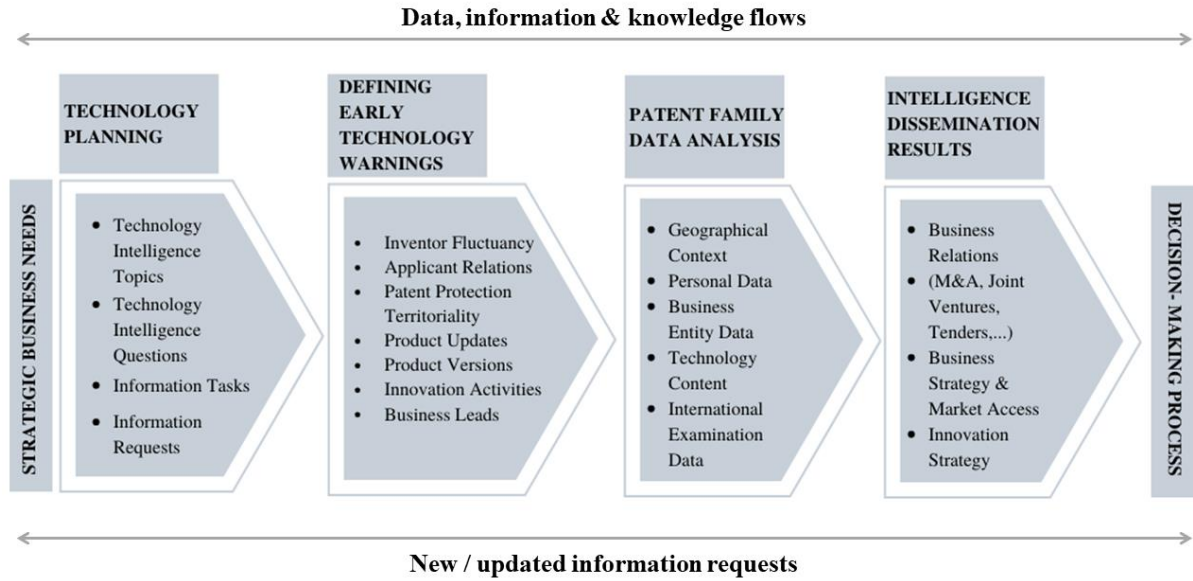
Source: Authors.

1.4 Performing the search

We would like to demonstrate the possible competitive technology intelligence analytical methods using patent family data from the EPO GPI and demonstrate getting particular outputs corresponding to our specified technology intelligence subprocess as has been shown in Fig. 1 above. For the purpose of this study we have chosen the patent families from Tesla Motor focused on selected social networking inventions with a retrospectivity of three years. GPI consists of EPO worldwide bibliographic database (DOCDB)[1] and provides three search interfaces: easy, simple and detailed. Each of the interfaces uses specific field codes together with specific search operators and syntax rules (EPO, 2016). The GPI search possibilities bring extensive syntax building process with relevant logical rules, so that researchers could effectively work with patent content vagueness and possible business or personal ambiguous name entities. For the purpose of this paper, we have mined patent data from the Tesla Motor patent families. The GPI field codes that we had to use described the application field *applicant* (the owner of the invention), particularly: APPD (DOCDB name), APPDA (DOCDBA name), APPO (original application name). We have used:

APPD OR APPDA OR APPO = (tesla AND motor*)

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[1] The DOCDB index is the largest patent data index worldwide and also belongs to one of the crucial parts of commercial systems as GPI.

The results have shown that with no date limitations there are presently 308 patent families set by 1103 patent documents.

2. Results

From the perspective of territoriality, we can analyze the publication office for the patent protection extension as shown in Table 2.

Tab. 2: Publication Office Overview

#	Publication office	Documents
1	US	702
2	EP	155
3	WO	88
4	CN	57
5	JP	47
6	DE	19
7	CA	13
8	KR	8
9	TW	4
10	AU	4
11	HK	3
12	AT	3

Source: Authors, based on EPO GPI data.

We have continued in Table 3 with applicant analysis and show the main inventors who work with Tesla Motor. The GPI DOCDB index provides an individual analysis of a particular inventor, so we are able to see the connections between personal names and other companies than Tesla Motor.

Tab. 3: Inventor Overview

#	Inventor	Documents
1	HERMANN WESTON ARTHUR	52
2	KOHN SCOTT IRA	42
3	VON HOLZHAUSEN FRANZ	35
4	LEE BERNARD	17
5	KELTY KURT RUSSELL	17

Source: Authors, based on EPO GPI data.

Considering the name entity *Arthur Weston Herman,* we have conducted a search in the patent index with following syntax and the same bibliographic structure:

INV = ("HERMANN WESTON ARTHUR")

As result, we have 67 patent analyses, and alongside Tesla Motors we have discovered that the inventor also co-operated with **QuantumScape Corp.**

When we consider the detailed patent family data analysis, we can see it within the context of similar, but not identical technologies. For example, we have chosen to find any evidence of possible Tesla Motor patents directed toward cooling systems for vehicle batteries with this specified GPI syntax:

APPD OR APPDA OR APPO= (tesla AND motor) AND WORD = (cooling AND batter*)*

We have found the oldest priority application from 48 patent documents within 12 patent families. Given the Tesla Motor patent bibliographical document record titled *Method and Apparatus for Mounting, Cooling, Connecting and Protecting Batteries,* with the priority number US 12911805 A 20050512, we can uncover a simple family with 19 members, and a DOCDB extended family with 26 members. The original document creates an extended family of documents with the same technical scope, but also with similar content, e.g. *Battery mounting and cooling system* (US 201514706837 A 20150518), or *System and Method for Inhibiting the Propagation of an Exothermic Event* (US 98191210 A 20101230). All three documents are connected to the original priority US 12911805 A 20050512, but they do not strictly cover the same invention.

3.   Discussion and Conclusion

The aim of this paper was to demonstrate how to use patent family data for Technology Intelligence processes. First, we have defined a generalized patent application structure, then identified the patent family concepts with a possible usage in technology intelligence, following patent data collection possibilities within the Global Patent Index, part of which is the EPO DOCDB database — the most significant bibliographic patent source. For the purpose of this paper we have chosen to analyze Tesla Motor patents with regards to territoriality, inventors and their relations to other entities, and used patent family member analysis to demonstrate how they are indirectly connected to particular patent applications. This method could be used in

any industry, or when key market technology player competitive technology intelligence analysis is requested. From our point of view, the patent family concepts must be considered as a crucial source when validating or discovering technology state-of-the-art and possible technology trends together with relationship among private companies, institutions and academia. Although we see relatively high cost with respect to expert knowledge, or individual fees, patent families should not be underestimated especially by technology companies, from start-ups to global enterprises.

Our recommendations for further patent family competitive technology intelligence use are specifically focused on business decision-making processes due to the possibilities of patent data analysis with respect to its rich data structure, update frequency and accessibility. Moreover, businesses and organizations could get competitive advantage when seeking intellectual property protection, analyzing competitor innovation activities, or wanting to support their investment decision-making process. Our further work is directed towards patent family data and social media contextual analysis with respect to the aforementioned business scenarios.

Acknowledgement

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CONSUMERS´ AWARENESS ABOUT CIRCULAR ECONOMY MODEL IN SLOVAKIA REVISED

Jennifer Drugdová - Zdenka Musová

Abstract

Purpose: Nowadays, the new economic model – circular economy (CE) – is often discussed as a solution for increasing environmental problems. The aim of the paper is to present the selected results of primary research focused on Slovak consumers´ perception and attitudes to the new economic model – circular economy.

Design/methodology/approach: Consumers´ awareness about circular economy (CE) was examined through the questionnaire research, which was realized on research sample of 468 respondents. Basic consumer knowledge of CE and availability of information in the context of selected demographic characteristics were investigated. Descriptive statistics was used and some of the data were processed with Pearson Chi-Square and Fisher´s Exact Test.

Findings: The results of the survey confirmed the generally low awareness of Slovak consumers. Statistical correlation was confirmed between age groups and consumer awareness about the CE model. The best results were achieved by the Z and Y generation.

Research/practical implications: For successful transition of CE more relevant information for consumer with the aim to build their CE awareness is needed. Responsibility for ensuring sufficient information is not only on state institutions, sustainable businesses which are implementing CE principles can have an important role in this process too.

Originality/value: In Slovakia is the topic of circular economy new and it needs to be examined in detail. Our preliminary research is the starting point and will be followed by another consumers and businesses researches with the aim to define conditions for successful implementation of CE model in Slovakia.

Keywords: circular economy, CE principles, environmental responsibility, consumers´ awareness, socio-demographic characteristics

JEL Codes: M14, Q56

Introduction

In the current world with limited resources and long-term problems in natural environment, more responsible behaviour of countries, companies and households is required. Innovative economic model – circular economy – is being more and more discussed on European and national levels as a solution for this global problem.

Transition on circular economy model requires fundamental changes in supply chain and engagement of all market subjects. Change of attitude and thinking is priority at all scales – consumer, business, academic and politic. In this context is our intention to explore current consumers´ perception and attitudes to the environmental problems and circular economy in Slovakia in detailed way. In the paper, we present only selected results of our research focused on circular economy awareness of Slovak consumers, on which attitude and behaviour changes can be built in the future.

1.   Theoretical Background

Circular economy is new concept, which aims to put together economic and environmental factor. It represents difficult process of many changes, from consumers decisions, business processes to state regulations. The complexity of the model requires engagement and cooperation of all market players. Braam et al. (2018) state that more and more organizations (including NGO) are working in cooperation with state institutions on transition of national economies on circular model. In the European conditions is transition to the new economic model, circular economy, logical and inevitable. This is mainly because of high dependence level on imported raw materials and because of unstable political situation in the world. The implementation of the circular economy principles in the European Union could save up to 1.8 trillion € annually (Spirkova et al., 2016).

Circular economy is characterized by closed loops of material and energy with consideration on natural and human resources, science and technology. The value of products, materials and resources is maintained in the economy as long as possible (Kirchherr et al., 2017). The main features of this model are renewable resources of energy, eco-innovations, renting, sharing and local business supporting. Businesses are one of players in the process of circular economy implementation. "Green" business activities are nowadays realized not only because of cost reduction but also because of the increased pressure of environmentally responsible consumers (Musova and Musa, 2017).

The important role in the process of transition have also consumers. Segment of environmentally conscious consumers is getting bigger. They seek for environmentally friendly

products, they are minimalizing waste, recycling and preferring more "modest" life-style (Borello et al., 2017; Ertz et al., 2017). With their environmental behaviour they make a pressure on businesses to be responsible too. In context of new economic model, the role of the consumers changes. Braam et al. (2018) defines future consumer as a "prosumer" who influences the production and becomes the producer and consumer in the same time. In the opinion of Camacho-Otero et al. (2019) despite of raising interest of companies and governments in circular economy implementation consumers are less dedicated and the lack of their acceptance is one of the primary barriers in the transition process. It means the motivation of consumers, their willingness and acceptance of new circular economy offerings, is same important than the motivation of companies and states. According to Hankammer et al. (2019) consumers play a significant and active role in the success of closing material loops. Slovak Business Agency (2018) states that successful implementation of CE model requires cooperation of all market players – producers (ecological design), consumers (preference of new „circular" products) and states (rules favoring circular business). In the transition process the cooperation also requires raising awareness (Singh et al., 2019), but the European Commission declared in 2017 that environmental awareness of Slovak people is still very weak and the term in still unknown.

The term Circular economy is wide concept and there are many approaches, activities closely connected with it. Except the best known (in context with CE) 3R principles, functional economy, eco-design, industrial ecology, sustainable supply and responsible consumption are included in this term. Braam et. al. (2018) connect CE with following fields: materials, energy, water, society, health and prosperity. However, the aim of the CE is profit without raising environmental harms it can be associated with many ecological innovations, concepts etc. with the same aim.

2.   Research methodology

The main aim of the research was to examine consumers´ perception and attitudes to the new economic model – circular economy in Slovakia. In order to meet the main aim of the research we realized quantitative empirical research. During the November 2019 we collected all data through online questionnaire. We received 468 correctly filled questionnaires. We used the quota sampling to achieve the representativeness of the research. According to statistical data about Slovak residents we defined percentual proportions of respondents needed to ask considering to age and gender. Representativeness of research sample was evaluated through the IBM SPSS Statistics. To determine if the research sample is representative, following hypotheses were defined and verified at the significance level $\alpha < 0.05$.

H₀: $F_{(X)} = G_{(X)}$ (research sample is representative),

H₁: $F_{(X)} \neq G_{(X)}$ (research sample isn't representative).

Considering the p-value in Chi-square test (0.408) > α (0.05), at the significance level of 0.05 we do not reject the zero hypothesis, so the research sample considering to gender is representative. Considering the p-value in Chi-square test (0.088) > α (0.05) at the significance level of 0.05 we do not reject the zero hypothesis, so the research sample considering to age category is representative. Results are shown in Table 1.

Tab. 1: Statistical representativeness of research sample

	Observed N	Expected N	Residual		Gender		Observed N	Expected N	Residual		Age category
Women	245	236,1	8,9	Chi-Square	,683[a]	Generation Baby Boomers	136	149,4	-13,4	Chi-Square	6,537[a]
Men	223	231,9	-8,9	df	1	Generation X	100	96,4	3,6	df	3
Total	468			Asymp. Sig.	0,408	Generation Y	169	174,7	-5,7	Asymp. Sig.	0,088
						Generation Z	63	47,5	15,5		
						Total	468				

Source: Own elaboration of the data from IBM SPSS Statistics.

Only respondents older than 18 years old were asked. Research sample follows the structure of Slovak population born between years 1995-1965 (according to Statistical Office SR in research period, number of population = 4,438,462), in the terms of gender and age group belonging to different generations. Respondents distribution is presented in Table 2.

Tab. 2: Distribution of respondents according to the socio-demographic characteristics

Age group belonging to the generations	Baby Boomers generation (1946-1965): 136 Generation X (1966-1976): 100 Generation Y (1977-1994): 169 Generation Z (only respondents older than 18), (1995-2001): 63
Place of living	Big City (100 000 residents and more):28 City (30 000 residents and more):151 Town (less than 30 000 residents):125 Village:164
Education	Primary education: 10 High school education without leaving exam certificate:62 High school education with leaving exam certificate:196 Bachelor degree:81 Master degree:111 Higher university education: 8
Monthly income	0-199 €: 24 200-499 €: 90 500-699 €: 127 700-999 €: 130 1000-1199 €: 55 1200 € and more: 42

Source: Own elaboration.

In developing the literature review of the paper, we used a variety of secondary data. In the primary research the basic consumer knowledge about circular economy model and sources of information in the context of selected demographic characteristics were examined. For data processing, we used selected mathematical-statistical methods (Pearson Chi Square Tests and Fisher´s Exact Test). We assume that, in the distributions of qualities, there exist statistically-significant discrepancies at the level of $p < 0.05$.

3. Results and discussion

In our research we focused on consumer perception of the new circular economy model, which we consider as an important part for successful implementation. With intention to get a comprehensive overview about circular economy awareness of consumers in Slovakia, we analysed obtained data in general (all respondents) and in detailed view (considering to gender and age group). Results are shown in Table 3.

Tab. 3: Circular economy awareness

Question *"Do you know the concept of circular economy?" /options*		Absolutely yes *(I know the concept, I understand what does it mean and I am able to define it.)*	More yes than no *(I have heard about the concept, I have an idea what does it mean but I am not able to define it.)*	More no than yes *(I have heard about the concept but I don't know what does it mean.)*	Absolutely no *(I have never heard about the concept.)*
Respondents in general		**9.2 %**	**29.5 %**	**24.6 %**	**36.8 %**
Considering to gender	Men *(100%)*	8.5 %	28.3 %	22.9 %	40.4 %
	Women *(100%)*	**9.8 %**	**30.6 %**	26.1 %	33.5 %
Considering to age group belonging to the generations	Baby Boomers	5.9 %	18.5 %	**25.9 %**	**49.6 %**
	Generation X	7.0 %	24.0 %	**34.0 %**	**35.0 %**
	Generation Y	**9.4 %**	**40.0 %**	19.4 %	31.2 %
	Generation Z	**19.0 %**	**33.3 %**	20.6 %	27.0 %

Source: Own elaboration.

When considering awareness about new economic model of consumers in Slovakia in general, only 38.7 % from all respondents had an idea what the concept means (9.2 % of the respondents exactly know what circular economy is). Most of the respondents (61.4 %) have never heard about the concept or have no idea what does it mean. More detailed percentages show (respondents considering to gender) that between men and women are no significant differences in their awareness.

Significantly better knowledge of the CE model was noticeable in respondents of generations Z and Y. These two generations are the youngest and often connected with higher environmental awareness. According Gures (2018) for generation Y is typical higher level of responsibility to the environment and willingness to be part of voluntary activities, they are pragmatic and environmentally aware. Similarly, Generation Z is also environmentally aware and environmentally oriented not only in buying decisions but also in daily life (Kusa & Greskova, 2016).

For statistical verifying of socio-demographic influence, we used Chi-square tests. According to results, there are significant records for different attitudes of different age group (in both tests p-value = 0.000). At the significance level of 0.05 we accept the assumption that there is a correlation between age group belonging to the generations and circular economy awareness. Correlation between gender and awareness about CE concept has not been confirmed (p-value = 0.487 (Pearson Chi-Square); p-value = 0.489 (Fisher´s Exact test) (Table 4). To define how strong the correlation is, we analysed correlation values (Phi=0.282; Cramer´s V= 0.163), which were not overreaching the medium dependency between variables

– age group belonging to the generations and awareness about new economic model (only weak, linear connection). Examining other socio-demographic characteristics and their correlation with Slovak consumers´ CE awareness will be the part of our future research with aim to define the weakest groups.

Tab. 4: The results of Chi-square tests

	Pearson Chi-Square		*Fisher´s Exact Test*	
	Gender	Age group belonging to the generations	Gender	Age group belonging to the generations
p-value	.487	.000	.489	.000

Source: Own elaboration of the data from IBM SPSS Statistics.

Most of the respondents who have already heard about the concept, (176 respondents from research sample have answered optional open question about the concept information source) know this concept from media (33.5 %), school (24.4 %) or internet (19.9 %). (Figure 1). Even though the most respondents heard about the concept in media, this applies primarily for generation of Baby Boomers and generation X. Generation Y heard about Circular economy also in media but most of them heard about concept in school or on the internet, generation Z primarily in school. What is needed to remark is, that these two generations (Y and Z) have bigger awareness about the CE concept.

Fig 1: The source of information considering to generations
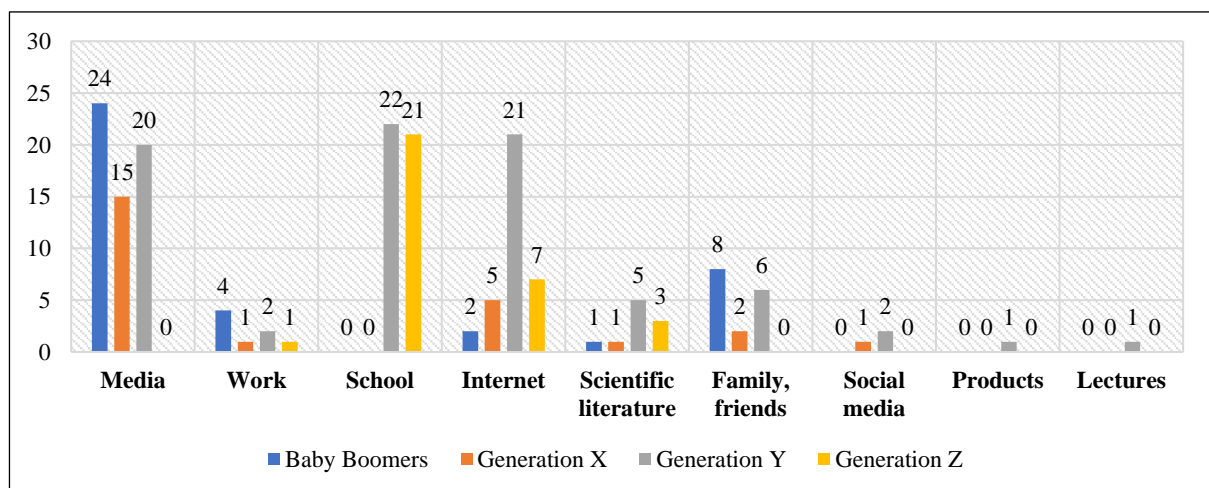
Source: Own elaboration.

However, the less aware were respondents of generation X and Baby Boomers, it is desirable to focus marketing communication specially on this age category (54 years and older).

Acording to Smolka (2019), these people are traditional, loyal, economical and individually oriented. Factors, which could possibly change their skeptic and individually oriented behavior closer to circular model will also be the part of our future research.

Even though CE awareness of Slovak consumers is still weak, study from European Commission focused on citizens who has already chosen alternatives to buying new products (remanufactured product, leased or rented, sharing schemes), Slovakia showed approximately average results (almost 30 % of respondents has already chosen these alternatives, 45 % has not). Considering to study of Sijtsema et al. (2019) weak awareness is not problem only of Slovakia, the authors mention that "most consumers did not have a clear understanding of the term circular economy." EC declare that electronic mass media are nowadays most important tools for informing about news, what was confirmed by our research. Hartley et. al (2020) agree and in their study, they say it is needed to do a significant amount of "pulling" in the context of raising awareness a changing attitudes (which are in their opinion crucial factors in stimulating CE transition). By "pulling" are meant government strategies and campaigns for cultivating awareness of consumers (by making them aware that it is "an important lever to elevate demand for circular products"). Most of the respondents of our research (33.5 %) have heard about CE in media. School appears as an important and effective tool for building awareness of generation Y and Z. Based on the finding is needed to raise the awareness in general but specially of older population. Although mass media are effective for presenting new model, in our opinion businesses can also participate. Hartley et al. (2020) declare that governments has an important role as generators of programming, publications, and communications campaigns, while the private sector (managing director) and NGOs (project leader) also contribute. Through their marketing strategy they can inform and educate consumers about new economic model, its benefits and need of their participation, what will eventually raise their business profits. What is interesting is finding of Sijtsema et al. (2019) that even though most consumers don´t know the term or concept their associations pointed in the right direction. The authors declare the importance of "linking the CE to concrete practice cases and providing advantages and functionalities." In their opinion it could contribute to "creating more familiarity with the concept of a CE and, more importantly, to consumers' willingness to relate the conceptual issues to their own behaviours." By the connecting all above we see a wide place for cooperation between government and business practice for promoting CE (in media primarily) through the practice cases - linking associated activities (3R, sharing economy, ecological products, consumer habits according to CE (buying and living) etc.) with circular economy as

a main roof connecting all these activities in to one concept, which has a big potential for fundamental change.

Conclusion

The aim of this paper was to analyse circular economy awareness of consumers in Slovakia and information availability about this model. The correlation between consumers´ awareness and selected socio-demographic variables were examined (gender and age groups belonging to the generations).

The consumer role in circular economy is not only about seeking environmentally friendly products, it is also about being a part of a closed loop, about cooperating with other market players, buying products from companies, which are taking responsibility for their business, separating and recycling waste in accordance with principles of circular economy. However circular economy model is new, the first step to support the transition is awareness. With the general view on the achieved results we can state that the awareness about circular economy of Slovak consumers is weak. Most of the respondents have never heard about the concept or have no idea what does it mean. According to results there is a correlation between age group belonging to the generations and circular economy awareness. Younger generations (Z and Y) have higher awareness. Gender is not significant in this context.

The results of our research may be relevant for various institutions which are interested in circular economy implementation in conditions of Slovakia. Our findings will be followed by more detailed examination of the market players behaviour in the circular economy principles implementation (especially consumers and businesses).

Acknowledgement

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WHAT PREVENTS CZECH WOMEN FROM CHOOSING ENTREPRENEURSHIP AS A CAREER PATHWAY?

Ondřej Dvouletý

Abstract

Purpose: The study aims to explore the barriers faced by Czech women when considering entrepreneurship as an occupational choice.

Design/methodology/approach: We exploit data from the recent 2017 Ad-hoc module of the European Union (EU) Labour Force Survey (LFS). We also explore whether the perceived barriers of entrepreneurship depend on the age and the level of education, by using Chi-square tests of association.

Findings: The LFS data show that most of the economically active women (working as employees or family workers) do not consider switching to self-employment from their current occupations. Those who consider the transition into entrepreneurship, mostly struggle from financial insecurity, too much stress, responsibilities or risk and other reasons. We find that the reasons differ across age, but not across education attained.

Research/practical implications: We provide a series of recommendations for future research on women entrepreneurship in the Czech Republic, by pointing out the need to better understand the role of family background, caring responsibilities and mutual-partner support in women´s decision to become self-employed.

Originality/value: The study provides novel insights on the barriers of female entrepreneurship on the example of the post-communist economy.

Keywords: Barriers of entrepreneurship, female entrepreneurship, self-employed women
JEL Codes: J16, L260

Introduction

Numerous studies have been explaining differences in entrepreneurial engagement of males and females by combining entrepreneurship theories and feminist perspectives (Winn, 2005; Yadav and Unni, 2016) and still, fewer women than men are choosing self-employment as a career pathway. Even policymakers attempt to encourage women to join entrepreneurship, helping them on this challenging journey through various public policies (Foss et al., 2019; Coleman et al., 2019).

The crucial question is – what prevents women from joining entrepreneurship? Is it a lack of financial resources, skills and abilities, confidence or just a fear of failure (Minniti, 2010; Yadav and Unni, 2016; Poggesi et al., 2016)? In this article, we contribute to this ongoing discussion from the perspective of the Czech Republic - a country located in Central Europe which has experienced the process of economic transition in the early 90s (Lukeš, 2017; Dvouletý, 2019). Wasilczuk and Zieba (2008) together with Rašticová and Bédiová (2016) point out that the context of economic transition and the need to restore private ownership in former communist economies, provided, both males and females, with relatively equal chances for the exploitation of entrepreneurial opportunities. Nevertheless, still, the previously published studies investigating differences determinants of entrepreneurial engagement, show that women are less likely opting for entrepreneurship as an occupational choice (Lukeš et al., 2013; Dvorský et al., 2019; Dvouletý and Orel, 2020), although their engagement is increasing over time (Rašticová and Bédiová, 2016). Dvouletý (2019) documents the development of entrepreneurial activity in the Czech Republic over years 2005-2017 and reports that during the analysed period, there were 2.5times more self-employed men than women, concluding that the gender gap is still relatively large.

This paper exploits data from the recent 2017 Ad-hoc module of the European Union (EU) Labour Force Survey (LFS) and attempts to shed more light on reasons preventing Czech women from starting their own business. Moreover, we explore whether these reasons are related to age and the level of education attained.

1. Empirical Approach and Data

Our study aims to explore the reasons of the Czech females that prevent them from choosing entrepreneurship as an occupational choice. For this purpose, we utilise the EU Labour Force Survey (LFS) data. The EU LFS is the largest European representative survey dedicated to the labour market. Particularly, we use the recent 2017 Ad-hoc module that was focused on self-employment. The details on the questionnaire and data collection procedures can be accessed via Eurostat (2018, 2019). From the European sample, we exploit the Czech sample, including in total 40,993 observations (Eurostat, 2018; 2019). We further limit the sample only for economically active persons at the labour market (i.e. employed, self-employed or family workers), reaching 18,600 observations. Finally, we keep in the sample only females aged 15-64 years, and thus our dataset has 8,284 observations in total.

The 2017 Ad-hoc module (Eurostat, 2018) provides quite unique data on the attitudes of individuals towards self-employment. Given the aim of our research, we focus on economically active women who are employed or family workers, and who expressed willingness to become self-employed (LFS variable coded as PREFSTAP) and who described reasons why they sustain in their current occupation and do not switch to self-employment (variable coded as OBSTACSE).

After that, we aim to explore whether these reasons vary with the most fundamental determinants of self-employment, such as age or education (Sarri and Trihopoulou, 2005; Minniti, 2010). Therefore, we utilise techniques of statistical testing (Chi-square test and Cramer´s V) to see if these two variables shape the identified barriers of female entrepreneurship.

2. Findings

We begin by noting that the following statistical outcomes were weighted according to the relative size of the Czech workforce to provide reliable findings. First, the LFS data show that only 1.7% of the Czech women would like to change their current working status and switch to self-employment and the wast majority (95.9%) is satisfied with the current job (i.e. being an employee or family worker). However, despite the relatively low number of those willing to transit into entrepreneurship (N=187), we focus on them in more detail below.

According to the answers provided in LFS, most women are afraid, besides other reasons (33.6%), of **financial insecurity** (29.2%), of **too much stress, responsibilities or risk** (17.9%), and of having difficulties with getting **financing for the business** (17.1%).

We further explore whether the reasons change with age or education level attained. The results of the Chi-square tests of associations and Cramer´s Vs are presented in the following Tables 1 and 2. While we do find a statistically significant relationship between age category and reason for not becoming self-employed, we cannot empirically support the association with the education level. We may further observe that even the relationship with age is relatively low (Cramer´s V value 0.2). Nevertheless, we may still observe some interesting patterns. While for the youngest age group (15-29 years) the main concern is related mainly to financial aspects (insecurity and insufficient funding), the older women seem to be afraid, besides of the financial insecurity, more of stress, responsibilities or risks.

Tab. 1: Association between Age category and Reason for not becoming Self-employed (15-64 years, N=187)

Reason /Age category	15-29	30-44	45-64	Total
Financial insecurity	8.0%	14.2%	7.0%	29.2%
Difficulties with getting financing for the business	6.1%	8.3%	2.7%	17.1%
Too much stress, responsibilities, or risk	2.6%	8.4%	6.9%	17.9%
Less coverage from social protection	0.0%	0.0%	2.2%	2.2%
Other reason	7.6%	13.7%	12.3%	33.6%
Total	**24.3%**	**44.6%**	**31.1%**	**100.0%**
Test of association, Chi-Square = 17.4, p-value = 0.04, Cramer´s V = 0.2.				

Source: Own elaboration based on the Labour Force Survey (LFS) ad-hoc module 2017 data (Eurostat, 2018).

Tab. 2: Association between Education level and Reason for not becoming Self-employed (15-64 years, N=187)

Reason /Education level	Less than Primary and primary	Upper Secondary and post-secondary non-tertiary	Tertiary	Total
Financial insecurity	1.5%	17.6%	1.0%	29.2%
Difficulties with getting financing for the business	1.8%	13.2%	2.2%	17.1%
Too much stress, responsibilities, or risk	0.7%	11.6%	5.6%	17.9%
Less coverage from social protection	0.0%	2.2%	0.0%	2.2%
Other reason	1.5%	17.9%	14.2%	33.6%
Total	**5.5%**	**62.5%**	**32.0%**	**100.0%**
Test of association, Chi-Square = 11.9, p-value = 0.2, Cramer´s V = 0.2.				

Source: Own elaboration based on the Labour Force Survey (LFS) ad-hoc module 2017 data (Eurostat, 2018).

Notes to Education levels: Less than Primary and primary = ISCED 2011 0–2, Upper Secondary and post-secondary non-tertiary = ISCED 2011 3–4, Tertiary = ISCED 2011 5–8.

Conclusion

The previous research on the attitudes of individuals towards entrepreneurship in the Czech Republic identified as the main barrier fear of failure (Lukeš et al., 2013). The obtained findings from the 2017 European Union (EU) Labour Force Survey (LFS) show that in the case of the Czech women willing to pursue entrepreneurship career, it is mostly financial insecurity (besides other reasons). Furthermore, financial aspects of business start-up seem to be more important for younger women below the age of 29, while the older women concern in larger extend about stress, responsibilities or risks coming with founding and managing a business. Nevertheless, based on the existing empirical evidence, the proportions of female entrepreneurs in the Czech Republic are relatively low.

Therefore, we can only seek prospects for the future development of the Czech women entrepreneurs, through the continuous building of female entrepreneurship culture and sharing stories of successful women entrepreneurs (Adom and Anambane, 2019). Another question is, to what extent we should be designing specific entrepreneurship policies for women entrepreneurs, helping them to obtain financial capital for business start-up (Coleman et al., 2019).

The future research should expand these preliminary findings by studying the role of family background, caring responsibilities and mutual-partner support, and impact of these variables on female attitudes towards self-employment (Yadav and Unni, 2016).

Acknowledgment

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USAGE OF MACHINE LEARNING TO PREDICT MARKET ATTRACTIVENESS IN THE CONTEXT OF INTERNATIONALIZATION

Briam Daniel Falcó - Michael Neubert - Augustinus van der Krogt

Abstract

Purpose: The purpose of this study is to explore the perceptions, views, and opinions of chief technology officers (CTO) of software development firms (SDF) about how and why machine learning (ML) methodologies might be used to support foreign market evaluation and selection decisions.

Design/methodology/approach: A qualitative research was conducted. The research design is a multiple case study with six semi-structured, in depth interviews with CTOs of SDFs and corporate documents about ML applications from the case study firms as sources of evidence.

Findings: The results of this multiple case study suggest the following four findings: 1) The usage of ML to support foreign market evaluation and selection decisions has the potential to improve quality and efficiency, 2) data availability is a key factor of ML to support foreign market evaluation and selection decisions, 3) "easy to use" and "easy to interpret" machine learning supervised methods are the most suitable to support foreign market evaluation and selection decisions, and 4) existing ML development methodologies can be applied to support market evaluation and selection decisions. These findings have a limited generalizability due to the research methodology and are valid only for these case study firms.

Research/practical implications: The results of this study might be relevant for researchers who are interested in a further digitalization of decision-making processes. The results might also be relevant for practitioners to better understand the use of ML methodologies in complex and financially important decision-making processes like the evaluation and selection of foreign markets.

Originality/value: This work integrated fundamental theories of internationalization based on the works of Johanson and Vahlne in the Uppsala Internationalization Process Model with the concepts and methodologies of machine learning, whose relationship is yet not covered by the academic discourse.

Keywords: machine learning, internationalization, Uppsala Internationalization Process Model, decision-making, developing country

JEL Codes: M16, F17, C50

Introduction

The world is following a trend that is damaging longtime set trade rules and that adds unpredictability to how markets will behave (The World Trade Organization, 2019). Nevertheless, the recently announced EU-MERCOSUR Trade Agreement is set to strengthen commerce and add some predictability that member states of the two blocks can take advantage of, while other countries behave erratically. Small and medium sized companies (SMEs) from the EU and MERCOSUR can benefit from this trade agreement, and machine-learning methodologies can help to better understand internationalization processes. This work aims to integrate fundamental theories of internationalization based on the works of Johanson and Vahlne (2017) about the Uppsala Internationalization Process Model (UIPM) and Neubert and van der Krogt (2019) about market evaluation and market selection with the concepts and methodologies of machine learning, and inspired by the machine learning applications in entrepreneurship research (Coad & Srhoj, 2019) and for decision-making purposes (Dvouletý, Srhoj, & Pantea, 2020) public interventions for internationalization and foreign market penetration (Srhoj & Walde 2020).

This work is based on the statement of Coviello, Kano, and Liesch (2017) that states about the UIPM and the digital context: "Although Vahlne and Johanson conclude their arguments by recognizing how information technology is radically transforming international business, they do not explicitly address the impact of this transformation." This work addresses the calls for research of Coviello, Kano, & Liesch, 2017) and Neubert and Van Der Krogt (2018) for digitalization in the context of the UIPM.

The purpose of this study is to explore the perceptions, views, and opinions of subject matter experts about how and why machine learning methodologies might be used to support foreign market evaluation and selection decisions using a multiple case study research design with six semi-structured, in depth interviews with chief technology officers as subject matter experts and corporate documents about machine learning applications from their case study respective software firms as sources of evidence.

This paper is structured as follows: After this introduction, the literature review covers the most recent papers about the UIPM and machine learning methodology, and the conceptual framework used in this study. The second chapter explains the methodology used. The results are discussed in the third chapter. Finally, this paper concludes summarizing findings and proposing further research topics.

1. Literature Review and Conceptual Framework

This work relies on the foundation set by the UIPM. The UIPM has been a subject of great discussion in the academic discourse and it is particularly relevant to Paraguay and Europe, regions where Neubert and Van Der Krogt (2017, 2018) have proven that different types of companies' internationalization efforts can be described with the UIPM. For the machine learning literature, a model proposed by Awad and Khana (2015) was selected as the conceptual base for machine learning methodology, as it proves to be validated by a number of authors cited in the literature review.

1.1 The Uppsala Internationalization Process Model (UIPM)

Conceived in 1977 by Johanson and Vahlne, the UIPM is one of the most widely cited models in international business and contributed the first general model of the internationalization process of large firms (Gulanowski, Papadopoulos, & Plante, 2018). At its core, the model focuses on the gradual acquisition, integration and use of knowledge about foreign markets and operations, and on the incrementally increasing commitments to foreign markets (Johanson & Vahlne, 1977). The model describes internationalization as a gradual cyclical process that consists of "state" and "change" aspects, and suggests that the firm commits resources based on the extent of knowledge it has about a given market. (Gulanowski et al., 2018).

Its latest version from the year 2017 preserves the concepts of "state" and "change" aspects, with big changes and additions in their variables compared with the original model of 1977, which are the result of incremental changes of the model over the years. The change variables propose two starting points for change: commitment processes and knowledge development processes. The first variable is defined as "intermittent decision processes related to committing – or not committing – resources", and the second as "continuous knowledge development processes through learning, creating, and trust-building" (Vahlne & Johanson, 2017).

State variables are the result of (and affect) the change variables and consists of capability variables and commitment/performance variables. The first type of variable "reflects the ability to use resources for a particular purpose" (Vahlne & Johanson, 2017). And the commitment/performance variable is defined with "commitment" as the distribution of resources of the firm to its "functions, its product lines, the countries where it is active, and the relationships in which it has invested" (Vahlne & Johanson, 2017). Whereas "performance" refers to what has been achieved already.

1.2   Market Evaluation and Selection

Based in the concepts of the UIPM, Neubert (2017, 2013) developed a procedural process, "which shows the degree of structured and disciplined approach that is necessary to manage a global sales organization successfully" (Neubert, 2017). In this process four steps are identified as the steps that businesses follow in order to achieve their international business development goals.

In the first step "Market Evaluation and Selection" and the second step "Market Preparation", the most attractive markets are selected and a business model for them developed. The ability to learn about foreign markets and to create networks is the key driver of these two steps. During step one and step two, the firm needs to understand whether their firm-specific advantages according to the UIPM can be transferred to new foreign markets or if other competences might be considered or used as firm-specific advantages to compensate for the liability of foreignness and outsidership. Step three "Market Entry" and step four "Market Development and Growth" can be compared to the market commitment establishment chain of the UIPM. With growing market success, the firm is dedicating or investing additional resources in a new foreign market.

This work will limit itself to the first step of this international market internationalization process and market evaluation and selection, which includes some smaller tasks that could be of interest for the use of machine-learning methods. The first task is named "Selecting Appropriate Foreign Markets" and it recommends to first consider the exclusion criteria within a checklist approach before considering more specific variables. After the initial filtering, the second task comes into place: "Calculating Market Attractiveness". This task includes calculating market attractiveness, in which numerical values are assigned four fields to be analyzed: framework conditions and country risks, industry specific market potential, intensity of competition, and own competitive position. The company assigns variables to each field and the result is a ranking of markets where internationalization is recommended. The subsequent tasks involve more time and resource consumption and can be summarized as the creation of a business plan for the top markets. After selecting the best business plan, a strategy is drawn.

1.3   Machine Learning (ML)

ML is a part of the field of artificial intelligence (Awad & Khana, 2015), and over the years different sources have defined it in different ways. As a field of study, machine learning sits at the crossroads of computer science, statistics and a variety of other disciplines concerned with

automatic improvement over time, and inference and decision-making under uncertainty (Jordan & Mitchell, 2015).

ML development practices are not yet standardized. As Watanabe et. al (2019) demonstrated after a search query of 2358 papers, there is still little research on the topic and they stated that that "these practices depend on individual developers or organizations." Still, this work identified the methodology proposed by Awad and Khana (2015) and found it compatible with other methodologies such as the one proposed by De Souza Nascimento et al. (2019), which conducted a descriptive research in Brazil in the field of ML development practices. Additionally, it was found that the proposed methodology is in accordance to the findings of the Microsoft Research team (Amershi et al., 2019). The often limited access to high quality data in foreign markets limits the use of ML for international decision-making purposes (Coad & Srhoj, 2019; Chung, Kim, & Ryu, 2017). The speed of learning (here: collecting data) has a high impact on the efficiency of decision-making processes and the speed of internationalization (Neubert, 2018). Johanson & Vahlne (1977) describe this limited access to market knowledge and contacts as the liability of foreignness and outsidership.

Fig. 1. Conceptual Framework
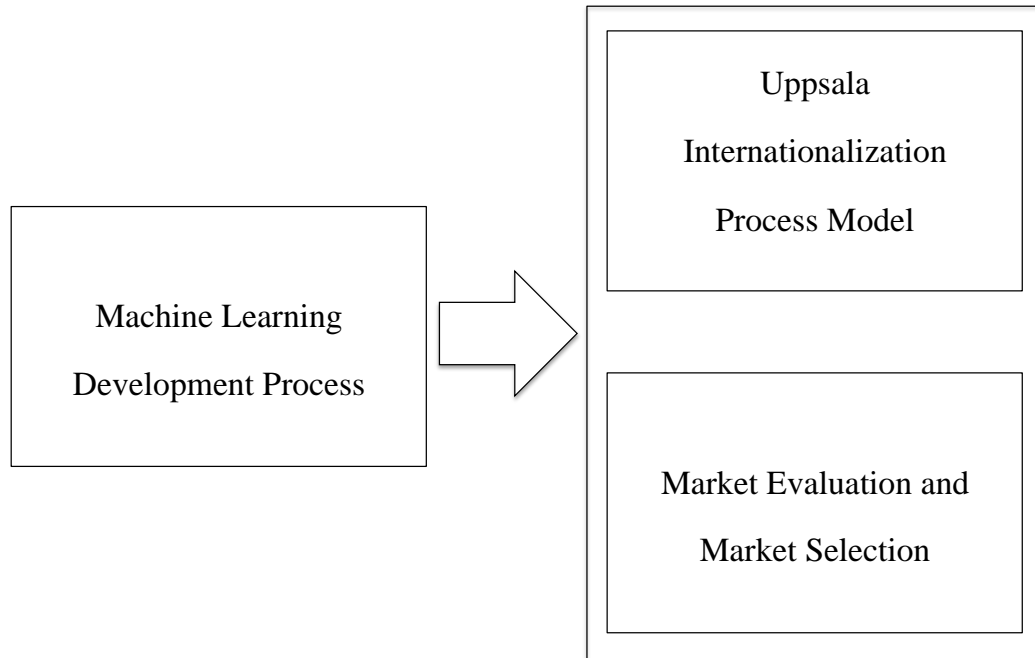
Source: Authors.

2. Methodology

Based on the purpose of this study, a multiple case study research design (Yin, 2018) was seleted to answer the research question of this study: What are the perceptions, views, and opinions of subject matter experts about how and why machine learning might be used to support foreign market evaluation and selection decisions?

This study uses a purposive and snowball sampling method (Yin, 2018). After conducting six semi-structured, in depth, online interviews, saturation was reached (Guest, Bunce, & Johnson, 2006). The case study firms are software development firms located in Paraguay and Brazil. They are involved in the development and the consultation of companies in the use of artificial intelligence to support decision-making processes. The subject-matter experts are chief technology officers (CTO) of these firms, having both an academic (= university degrees in computer science) background and practical experience (more than eight years) in the application of ML in decision-making processes.

Data was collected through six semi-structured, in depth, online interviews with CTOs as subject matter experts and corporate documents about machine learning applications from their case study respective software firms as sources of evidence. Saturation was reached after six interviews. The semi-structured, in depth, online interviews were conducted in October and November 2019 and lasted in average 47 minutes. The interview protocols were transcribed and member checking was used to guarantee credibility.

The data was analyzed manually using a thematic analysis and critical event analysis approach (Yin, 2018). Data analysis revealed four themes to answer the research question.

3. Findings

The following four themes emerged through the conducted thematic and critical-event analysis to answer the research question about the perceptions, views, and opinions of subject matter experts about how and why machine learning might be used to support foreign market evaluation and selection decisions.

Theme 1: The usage of ML to support market evaluation and selection decisions has the potential to improve quality and efficiency of decision-making processes of international managers. After a careful explanation of the concepts of market evaluation and market selection (Neubert, 2013), the subject-matter experts agreed that it is possible to develop a machine-learning algorithm that supports market evaluation and selection decisions, assuming that they have a significant amount of data related to the topic. The majority of the subject-matter experts stated that the quality of the market evaluation and selection decisions can be

improved when the data for the training of the algorithm consists of multiple variables and foreign markets, because the possible combinations of variables to predict market attractiveness grows exponentially as more relevant variables are added. One subject-matter expert added that combinations of variables can be missed if the task is performed by humans, who also would take considerable amounts of time in analysing datasets with multidimensionality.

The efficiency of foreign market evaluation and selection might also be influenced according to the subject-matter experts. The subject-matter experts mentioned several factors, which might influence efficiency: on-demand availability of data, results, and regular updates to verify or to update prior decisions, time savings to prepare decisions, coverage of a higher number of variables and foreign markets. Thus, the findings suggest that the usage of ML to support market evaluation and selection has the potential to improve quality and efficiency of decion-making processes.

Theme 2: Data availability is a key factor of ML to support market evaluation and selection decisions. All subject-matter experts stated that they would recommend small and medium-sized enterprises to use machine learning to support market evaluation and selection decisions. Two of the participants said that they would not consider company size as a relevant factor to implement ML. They all stressed the importance of data availability. ML algorithms tend to increase in their accuracy with more data. Nevertheless, one participant stated that thanks to technological tools data collection can also be automated and another one mentioned that there are methods to increase ML performance with relatively low amounts of data.

Theme 3: "Easy to use" and "easy to interpret" machine learning supervised methods are the most suitable to support market evaluation and selection decisions. Considering the unexplored nature of the usage of ML to support market evaluation and selection decisions, the subject-matter experts considered that "easy to use" and "easy to interpret" methods are the most suitable for this purpose. They recommended supervised algorithms to avoid the "black-box" effect and – as two subject-matter experts added – to increase the trust of decision-makers in the recommendations of ML algorithms. One subject-matter expert clearly expressed that unsupervised algorithms will be "insufficient" to address the issue due to transparency issues. The supervised algorithms that were mentioned as the most suitable algorithms are based on logistic regression and decision trees according to the recommendations of five subject-matter experts. They argued that the results of these algorithms are easier to interpret by decision-makers in small and medium-sized enterprises in contrast to more complex algorithms based on neural networks and support vector machines.

Theme 4: Existing ML development methodology can be applied to support market evaluation and selection decisions. Before explaining to the subject-matter experts the definitions and concepts of foreign market evaluation and selection, they were asked how they would describe the process of applying ML methodologies for decision-making purposes in their case study firms. Then, after discussing how and why ML can support market evaluation and selection decisions, the subject-matter experts were asked again to describe their preferred ML development process to support market evaluation and selection decisions and if it would be different from the process that they described before. Although the ML development processes to support market evaluation and selection decisions described by each subject-matter expert were slightly different especially in the details of each step described and in the terms used, they all agreed that they would use the existing ML development methodologies as described before they were explained the definitions and concepts of market evaluation and selection.

Based on the data analysis, the following process was synthesized using the steps described by the participants and their recommendations about how the UIPM might be integrated and how the state variables consisting of capability variables and commitment/performance variables trigger the need for selecting appropriate markets and calculating their attractiveness (Fig. 2). This need is then captured by an ML development process that consists of six steps: 1) collect the data, 2) preprocess the data, 3) transform the data, 4) train/test the algorithm, 5) tune parameters, and 6) execute (Fig. 2). The results of the executed machine-learning algorithm form part of the change variables in the UIPM as decisions are made based on the predictions of the algorithm and then the change variables trigger additional changes in the state variables.

Fig. 2. Integrated Machine Learning Development Process for Internationalization
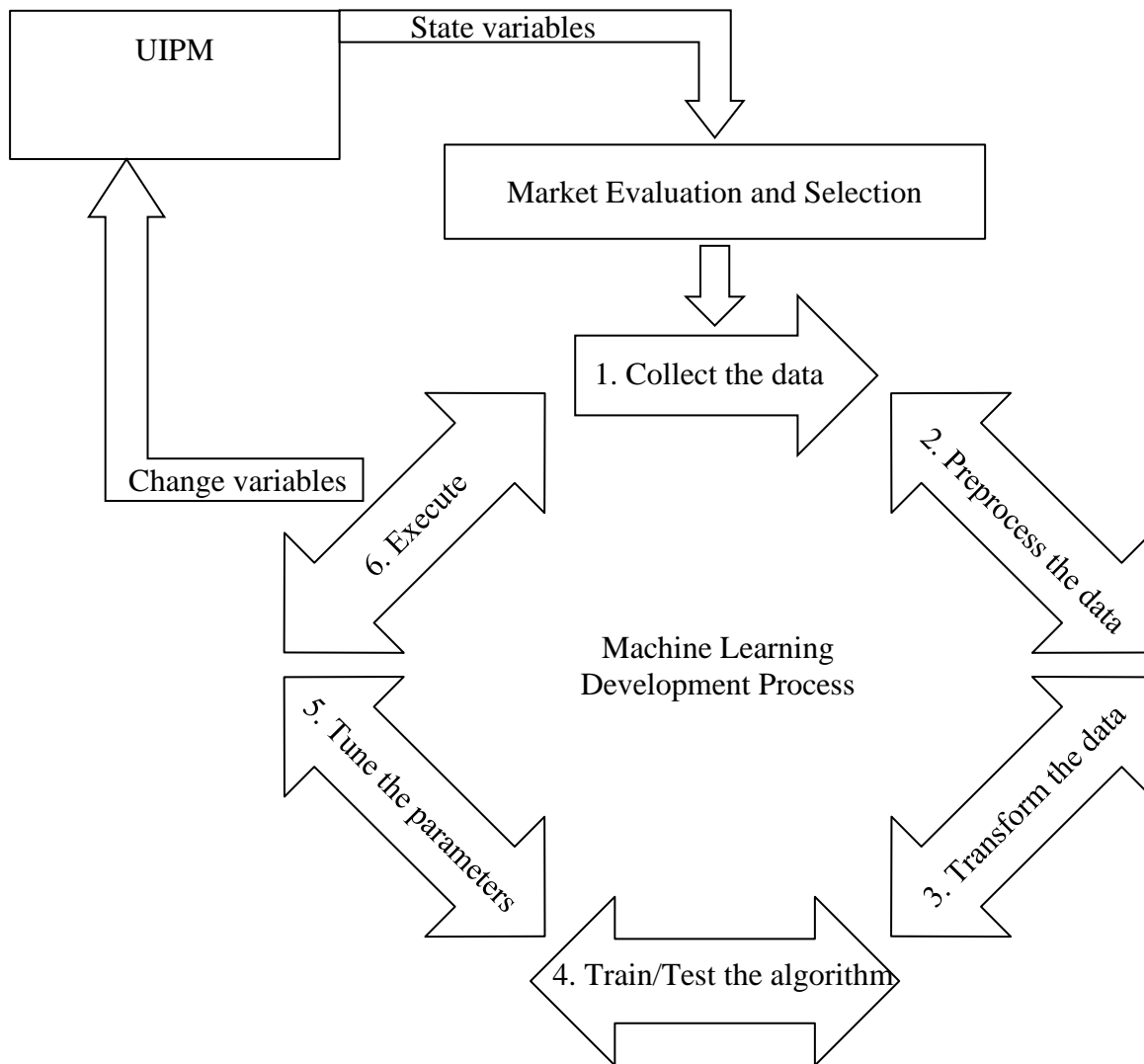
Source: Authors.

Conclusion

Using a multiple-case study research design, we were able to answer the research question of this work, that asked: What are the perceptions, views, and opinions of subject matter experts about how and why machine learning might be used to support foreign market evaluation and selection decisions?.

The results of this multiple case study suggest the following four findings: 1) The usage of ML to support foreign market evaluation and selection decisions has the potential improve quality and efficiency, 2) data availability is a key factor of ML to support foreign market evaluation and selection decisions, 3) "easy to use" and "easy to interpret" machine learning supervised methods are the most suitable to support foreign market evaluation and selection decisions, and 4) existing ML development methodologies can be applied to support market

evaluation and selection decisions. Based on the data analysis, a ML development process is proposed, which integrates the UIPM and includes the following steps: 1) collect the data, 2) preprocess the data, 3) transform the data, 4) train/test the algorithm, 5) tune parameters and 6) execute.

These findings have a limited generalizability due to the chosen research methodology and are valid only for these case study firms. The results of this study might be relevant for researchers who are interested in a further digitalization of decision-making processes. The results might also be relevant for practitioners to better understand the use of ML methodologies in complex and financially important decision-making processes like the evaluation and selection of foreign markets.

A multiple case study research design has several limitations in size and scope that offer new ideas for future research. There is a need to understand in more detail how ML development processes can be optimized and integrated in international decision-making processes. This includes practical experimentation and research about the identified ML development process for internationalization. Future research may also address behavioral aspects of decision-makers using qualitative research methodologies. Future scholarly work might also include quantitative assessments of subject-matter expert perceptions, views, and opinions, 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 form different industries and markets.

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INNOVATIONS IN FAMILY BUSINESS: SUCCESSION AND ITS INFLUENCE ON SOURCES OF INVESTMENT

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Abstract

Purpose: This research paper is dedicated to innovation in family businesses. The aim is to determine whether the degree of innovation in family businesses is related to the advent of successor generation, what kind of approach to innovation the successor generation has and what level of innovation in family businesses depends on other selected factors.

Design/methodology/approach: The methodology is based on the study of foreign and domestic sources and subsequent empirical research. The interviewing process took place between December 2018 and October 2019; research was built on 151 respondents of family businesses in the Czech Republic A graphical representation was used to evaluate the questionnaire followed by quantification of the association rates. The results were then tested using Pearson's test.

Findings: There is a relationship between succession in family businesses and the choice of different sources of invention and finance for innovation activities. And the greatest effects in implementing innovation are achieved by generations working together.

Research/practical implications: The conclusions can be used to plan succession and a take-over in a family business. Research shows that family businesses are likely to generate disagreement among its members, hence it would be useful to continue further research on other aspects of succession, such as the age of active family members (founders and successors), the goals of innovative activities or reasons for using different sources of financing.

Originality/value: The research addresses not only innovation and innovativeness in family businesses but also examines how the successor generation has an impact on the frequency and degree of innovation in family businesses. The main benefit of this research is that it brings significant insights into the approach and influence of the successor generation on the innovation of Czech family businesses.

Keywords: family business, succession, innovation

JEL Codes: M21, M14, O31

Introduction

Family businesses are an integral part of the economies of all states. While in many countries family businesses have a long tradition and therefore have long-term experience with the emergence of new generations of successors and the gradual transfer of family businesses, in the Czech Republic this phenomenon had not been felt until recently due to the interruption of the continuity of private business between 1948 and 1989. Innovation potential means the company's overall ability to meet its long-term market objectives. An important element in the family business's approach to innovation is the role of a successor in the family business.

This research paper is dedicated to innovation in family businesses. The aim is to determine whether the degree of innovation in family businesses is related to the advent of successor generation, what kind of approach to innovation the successor generation has and what level of innovation in family businesses depends on other selected factors.

The research addresses not only innovation and innovativeness in family businesses but also examines how the successor generation has an impact on the frequency and degree of innovation in family businesses. The main benefit of this research is that it brings significant insights into the approach and influence of the successor generation on the innovation of Czech family businesses

1.　　Theoretical and research background

The article focuses on the innovativeness of family businesses in the Czech Republic regarding succession. Innovation and succession in family businesses have been addressed by multiple foreign as well as Czech authors. Servus, Elischer and Horáček (2018) focus on succession, which they define as the transfer of the management of a family business and its ownership from one generation to another. This is a complex and long-term process that involves planning the transfer of responsibility, capital, competencies, etc. Differences are also noticed depending on each generation of successors. Machek (2017) points out in his research that family businesses tend to have lower wages than non-family ones, however, they offer lower turnover and higher job security. Hnilica and Lukeš (2019) affirm that family firms are more stable, especially in times of crisis while showing lower labour productivity. Stability may thus be linked to greater support of socio-emotive wealth and family values through successive generations. Jurik, Křížková, Pospíšilová and Cavander (2019) analyse gender approach and gender stereotypes in family companies.

Teichert, Hillebrand and Steeger (2019) look at the impact of two key parameters - family (family) and diversity (non-family) management on innovation in a family business. The

research is based not on comparing family and non-family businesses but on comparing different types of family businesses which can be highly heterogeneous. The generational development of a company and the involvement of external management influence the innovation potential of the company. Thus, for example, favouring kinship over eligibility may have a negative impact on innovation, e.g. prioritizing non-economic goals and family needs over financial goals. Lazzaroti, Gjergji, Visconti and Garcia-Marco (2019) deal with open innovations, i.e. innovations whose resources are outside the organization. It provides a comprehensive review of literature on open innovation in family businesses emphasizing their importance in managing family businesses and the need for family businesses to open themselves to external incentives. Lazzarotti and Pellegrini (2015) discuss differences between family businesses managed by non-family managers compared to family businesses managed by family managers. Those managed by non-family members show greater openness to external influences and innovation. Filser, De Massis, Gast, Kraus, and Niemand (2018) report other interesting insights into how family functionality and the dimension of building and transferring socio-economic wealth affect company's innovation. Hauck and Pruegl (2015) draw attention to the inconsistency of the results of previous studies and attempt to characterize the influences that negatively affect the willingness to innovate (greater closeness, tendency to conservatism, commitment to traditional products…) and opportunities which lead family businesses to be more willing to innovate (good communication among family members, high desire to maintain the family's reputation, and commitment to the company). However, no study has dealt with the specific stage that is currently occurring in the Czech Republic with the plentiful arrival of the first generation of successors in family businesses since 1989. This situation offers a unique opportunity to address the research of family business innovativeness not only with respect to first generation successors, but also in light of ongoing changes in business automation and computerization in connection with the current Industry 4.0 initiative.

2.   Methodological procedure

Empirical research was based mainly on data collection in the form of a written questionnaire survey in 2018 and 2019. The basic sample consisted of family enterprises whose representation in the total number of all business entities in the Czech Republic is estimated at more than 87% (EFB, 2014) and whose definitions are based on the five definitions of the 2016 Family Firm Institute (FFI, 2016). This brings together the views of different authors (Miller et al., 2007, FFI, 2016 - Sciascia and Mazzola, 2008, FFI, 2016) regarding issues of family businesses. In total, relevant data were obtained from 151 family business entities which were subject to

further evaluation. Data were obtained by the questionnaire method. The enterprises were mainly from the Moravian-Silesian Region and the Olomouc Region. 46% of enterprises were micro-enterprises with up to 19 employees. Another large group were small enterprises with 41% of enterprises. A detailed description of the companies by size is given in Fig. 1. Smaller medium-sized enterprises are enterprises with between 50 and 99 employees, larger medium-sized enterprises with between 100 and 249 employees.

Fig. 1: Analysed enterprises by size
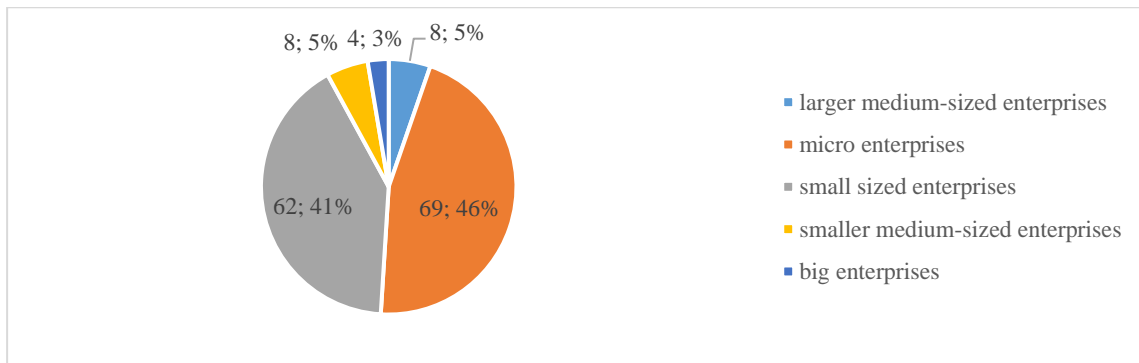
Source: Own.

Data are also aggregated according to the legal form of each business. As expected, the most common form was a limited liability company - 62% of all companies involved. 30% of businesses were individual entrepreneurs. 7% of enterprises are a.s. and only one enterprise has the legal form of v.o.s. In terms of business, the data are very varied and declared in Fig. 2.

Fig. 2: Analysed enterprises by field of business
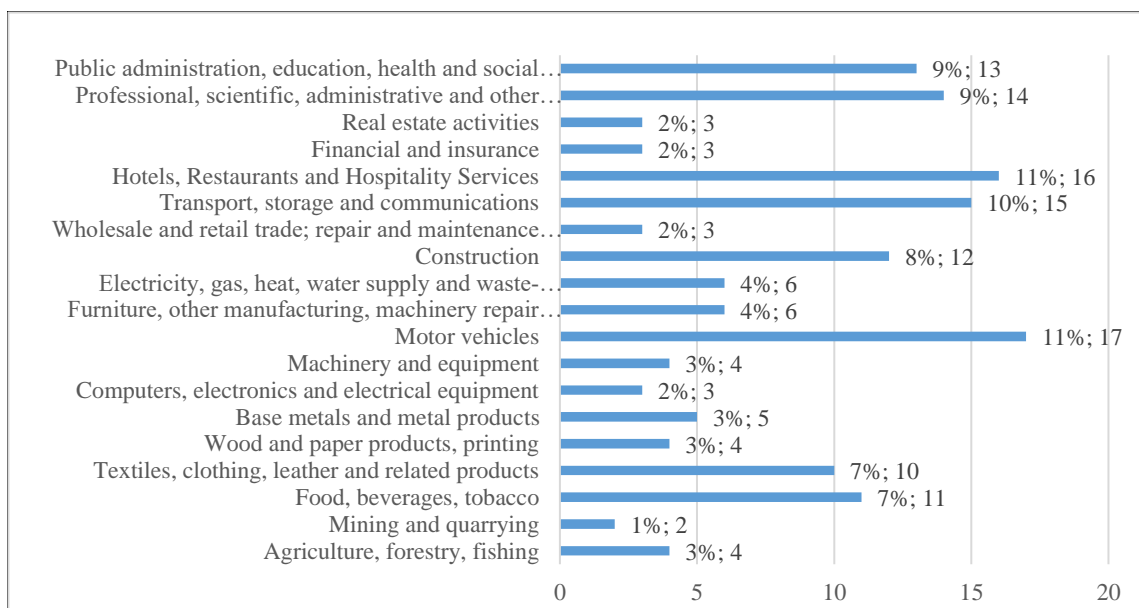
Source: Own.

The questionnaire contained questions:

a) used to identify the entity regarding the size of the family business, the place and the branch and its operation, the existence of the business or the age of the management of the family business, b) focused on the issue of innovative behaviour in the company (realization of innovation, type of realized innovations, use of resources for innovation activities - internal, external, mixed, shared), c) focused on the issue of succession (implementation of succession in the company, involvement of successors in business activities and consistency of innovative behaviour of founders and successors).

Research questions and hypotheses were based on previous literature analysis, in particular those which relate to the results published in the articles by Hauck and Pruegl (2015) and their perception of the successor phase as an opportunity for innovation and the results of Lazzarotti and Pellegrini's research (2015) dedicated to the willingness and reluctance towards innovation in family businesses.

The basic research questions were focused on innovative behavior in family businesses, the connection of succession with the innovative behavior of the family business and the resources and financing of innovation in the family business in connection with the involvement of the successor generation. Who is usually the carrier innovation in a family business? What is the efficiency of innovation in involving the successor and the original generation of the family business? Are owners or successors more likely to use internal, mixed, or external resources to innovate. The factors specified in the defined hypotheses are succession, the founders and successors' approach to innovation and the sources of innovation. To calculate the dependencies of two categorical variables, as in this research, association rates must be used. These can be based on the size of the frequencies in the contingency table. In the case of variables independence, measures take values of 0, higher values then indicate a higher degree of association. This contribution uses the gamma coefficient, Sommer's d, Kendal τb, kendal τc, and finally the test using χ^2.

3.   Results

Before determining the hypotheses and verifying them, it is fitting to graphically assess the proportion of family businesses with and without successors that have made innovations (Fig. 3).

Fig. 3: Overview of innovations in family businesses according to the result of innovation
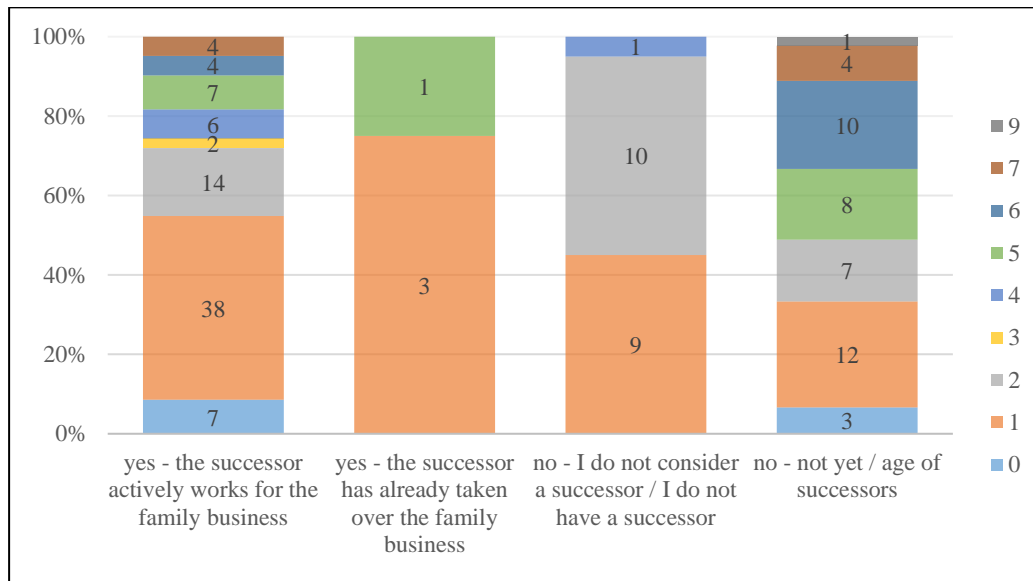
Legend: 0 (Result not reflected), 1 (Increase in turnover / profit), 2 (Sufficient demand), 3 (Reduce costs), 4 (Reduce / increase / improve human resources etc.), 5 (Market expansion), 6 (Gaining New Knowledge), 7 (Adapting to Industry / Competitive Innovation)

Source: Own.

Considering the dependence of inventive sources and succession in family businesses, several hypotheses can be established. **Hypothesis 1**: Successors are usually the sole bearer of innovation and these innovations are predominantly internal. **Hypothesis 2:** If successors' approach to innovation in a family business is quite different from the previous generation, they mainly use external sources of invention. If we look at the results of the research as a whole, we can see that if the successor participates in the implemented investment, the source of invention and finance of innovation is to a greater extent internal or mixed, as shown in Fig. 4. Conversely, if the successor is not a bearer of innovation, then the ratio of internal and external resources is approximately the same. And if the successor is the sole bearer of innovation, the share of external resources is zero.

Fig. 4: Sources of invention and finance changes in enterprises, total
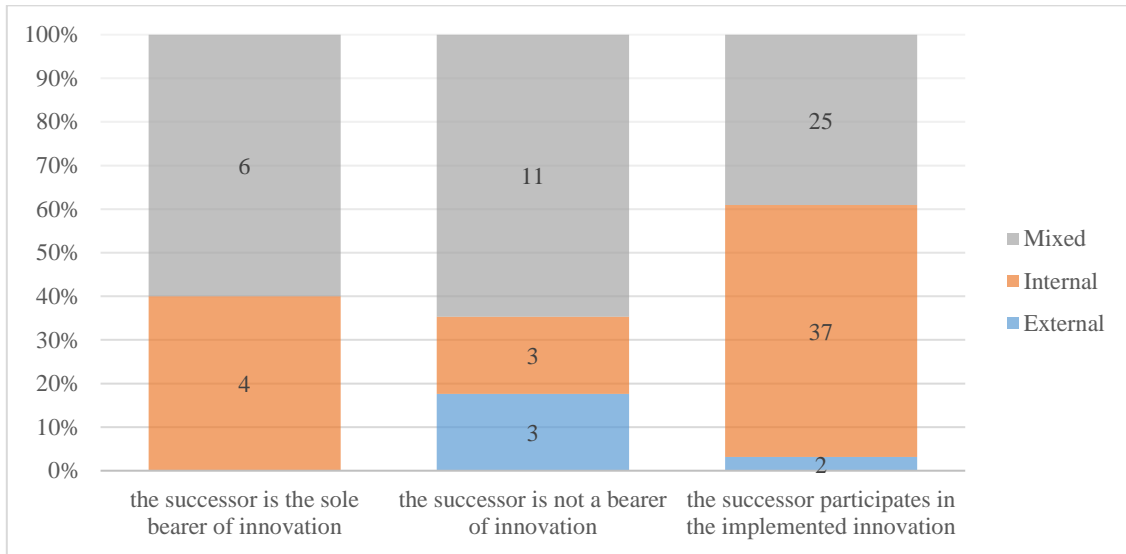
Source: Own.

If the successor is already actively working for the family business or has already taken over the business, the situation is shown in Fig. 5. It can be seen that the use of external or internal resources is similar and does not differ much from the companies managed by the first generation.

Fig. 5: Sources of invention and finance changes in enterprises with successor
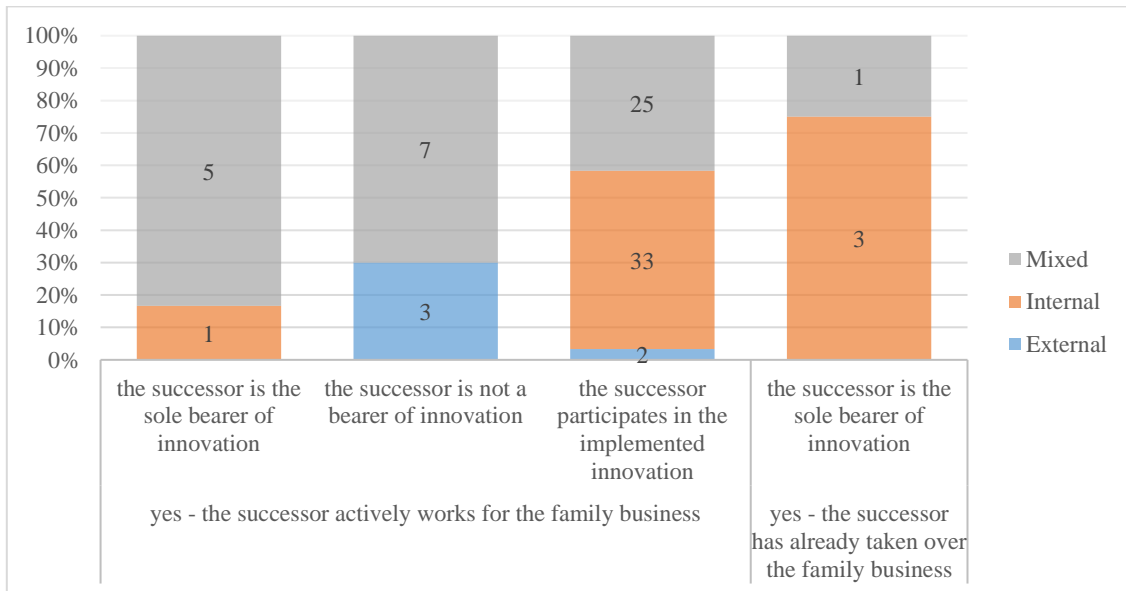
Source: Own.

This can be confirmed by a contingency table with the expression of frequencies and it can again be seen that the absolute frequency of successors who are already actively working in the company is the highest in the financing of 42 mixed respondents (Tab. 1). At the same time, the table also shows that all respondents using external sources of innovation are from the group of successors.

Tab. 1: Absolute frequency of successors in family businesses and sources of investments and financial innovation

		Followers in family company				
		1	2	3	4	Total
Sources of investments and financial innovation	1	11	32	34	3	80
	2	0	0	6	0	6
	3	9	13	42	1	65
Total (Observations)		20	45	82	4	151

Source: Own.

If the successor is actively working in the company or has already taken over the company, and at the same time his approach to innovation is completely different from the opinions of the previous generation, a different result can be seen. If they are not the bearer of the innovation and despite their different opinion the innovation is implemented, its source is usually external or mixed. On the contrary, if they participate in the innovation, the source is usually a mix, or to a lesser extent internal, see Fig. 6.

Fig. 6: Sources of invention and finance changes in successor companies according to successors' approach to innovation
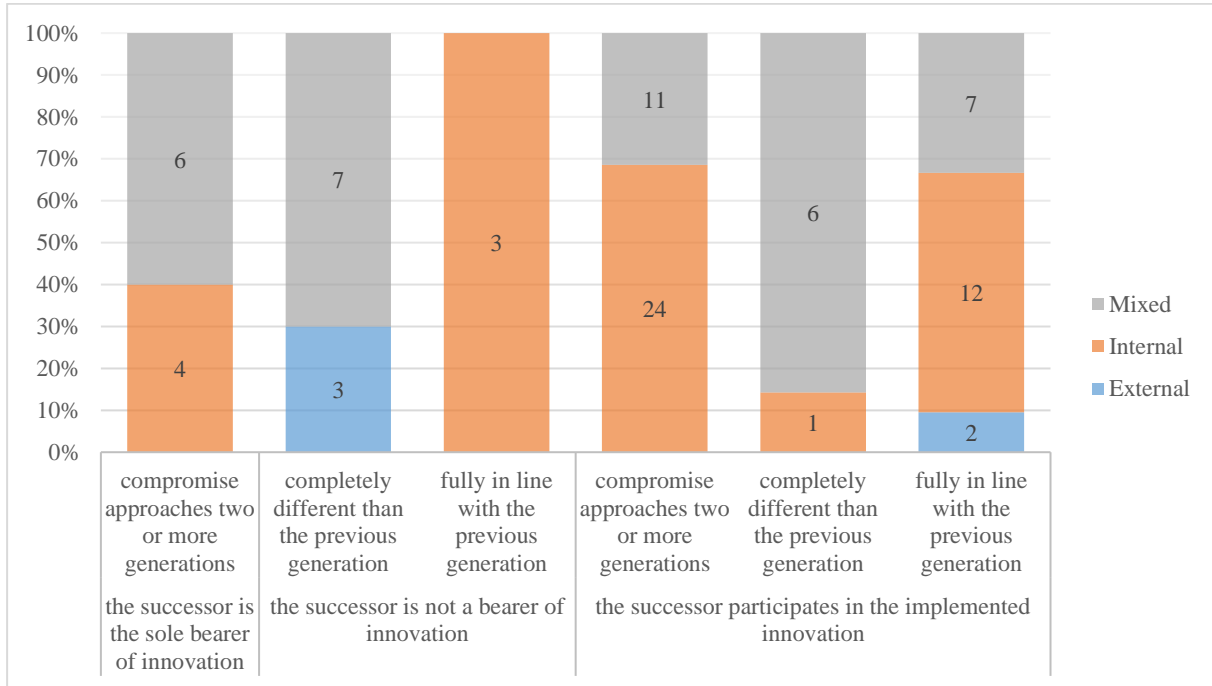
Source: Own.

If the approach to innovation is similar or at least a compromise, the results are very similar as in the first two cases, and the source of invention and finance are mostly internal or mixed. External sources are of marginal interest.

Tab. 2: Absolute frequencies. The followers' approach to innovation family businesses, sources of investments and financial innovation.

The followers' approach to innovation the family company Crosstabulation						
		The followers' approach to innovation the family company				
		0	1	2	3	Total
Sources of investments and financial innovation	1	27	10	28	15	80
	2	1	3	0	2	6
	3	28	13	17	7	65
Total (Observations)		56	26	45	24	151

Source: Own.

From the table of absolute frequencies (Table 2), it is clear that in the case of a successor, the most innovation will occur as a compromise between generations. Consequently, if the opinion of the next generation is quite different, the successors will use more mixed resources than internal ones. The difference is only 3 respondents. Conversely, if the successor's approach

is fully in line with the previous generation, the use of internal resources is more than double of mixed resources, and it entirely exceeds external resources.

The graphical analysis shows that the sources of invention and finance are more influenced by the conformity of successors' approach to innovation in the family business than their current involvement in the company or the succession rate in the organization. After graphical evaluation it is necessary to proceed to statistical processing of given dependencies. The statistical correctness of the hypothesis will be evaluated first: the successors are the bearers of innovation, especially internal ones.

Tab. 3: Degree of successors' association in family businesses, sources of investments and financial innovation.

Symmetric Measures		Value	Directional Measures			Value
Ordinal by Ordinal	Kendall's tau-b	0.142	Ordinal by Ordinal	Somers' d	Symmetric	0.141527
	Kendall's tau-c	0.120			Sources_of_investments_ and_financial_innovation Dependent	0.134
	Gamma	0.249			Followers_in_family_com pany Dependent	0.150
	Spearman Correlation	0.151				
Interval by Interval	Pearson's R	0.117				
N of Valid Cases (Observations)		151				

Source: Own.

Association rates of 0.142 were calculated based on Sommer's d, which is equivalent to Kendall's τ_b (see Tab. 3). When we consider sources of investment and financial innovation to be an explained variable, the asymmetric Sommer's d is 0.150. The Kendall's τ_c coefficient is slightly lower than the Kendall's τ_b coefficient. Therefore, all coefficients can be found in the lower third of the positive interval of their possible values. This means that the relationship of the variables is positive, so as the number of successors in family businesses increases, an increasing transition from internal to mixed sources can be expected. However, the tightness of the relationship is relatively small, and although there is no clear agreement among experts on what relationship can be considered tight, the values in this research represent an insufficiently tight relationship based on all theoretical rules. It follows that there exists only a loose relationship between succession in family businesses, sources of invention and finance for innovation.

Tab. 4: Degree of association based on the χ^2 test.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.963[a]	6	.030
Likelihood Ratio	16.351	6	.012
Linear-by-Linear Association	2.050	1	.152
N of Valid Cases (Observations)	151		

a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is 0.16.
Source: Own.

The result of the χ^2 test (Tab. 4) showed that the results are irrelevant with a 3% risk. If we work at a standard significance level of 5%, we can consider previous results relevant. Second hypothesis: If successors' approach to innovation in a family business is completely different from the previous generation, they mainly use internal sources of invention.

Tab. 5: Degree of association of the followers' approach to innovation in family businesses, sources of investments and financial innovation.

Symmetric Measures				Directional Measures			
		Value					Value
Ordinal by Ordinal	Kendall's tau-b	-0.131		Ordinal by Ordinal	Somers' d	Symmetric	-0.129
	Kendall's tau-c	-0.122				Sources of investments and financial innovation Dependent	-0.113
	Gamma	-0.209				The followers approach to innovation the family company Dependent	-0.152
	Spearman Correlation	-0.145					
Interval by Interval	Pearson's R	-0.148					
N of Valid Cases (Observations)		151					

Source: Own.

Again, some agreement can be seen in the criteria that have been quantified (Tab. 5). However, the values are negative, indicating a negative relationship between successors' approach to innovation and resource use. In other words, with increasing compliance with the previous generation approach, more mixed sources of innovation and finance for innovation are used. However, this relationship is negligible.

Tab. 6: Degree of association based on χ^2 test.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.051[a]	6	.061
Likelihood Ratio	12.616	6	.050
Linear-by-Linear Association	3.291	1	.070
N of Valid Cases (Observations)	151		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is .95.
Source: Own.

The results of this χ^2 test (Tab. 6) are no longer as appropriate as hypothesis 1. In hypothesis 2, the results are irrelevant with a risk of 6.1%. It is, therefore, necessary to state that the results can be accepted at a significance level of 6.1%, or the results are relevant with a reliability of 93.9%.

Conclusion

The first hypothesis can be excluded. The graphic analysis clearly showed that most innovations are implemented on the assumption that both generations will be involved in innovations. The second hypothesis cannot be confirmed, even if the approach of successors to innovation is completely different. If they are involved in innovation, they choose rather mixed resources. Non-compliance with the selected sources, where it is claimed that successors use rather external sources of innovation, could be mainly due to the scope of chosen questions. In this survey, respondents answered whether their sources of innovation were internal, external, mixed or shared sources of invention and financial sources. In other researches, the question of resources is often confined to invention. Nevertheless, in line with Hauck & Pruegl (2015), the result is that the greatest effects in innovation are achieved by generations working together. It also follows that further research should focus on factors which influence and support the cooperation of generations in family businesses, especially in relation to the age of active family members and the implementation of individual roles and research into the factors that lead to a more efficient use of sources of invention and innovation. Furthermore, special attention should be paid to the age of successors when they take over family businesses as it is a significant factor in their innovation potential.

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NEW TRENDS IN PERFORMANCE MEASUREMENT AND EVALUATION: A VIEW ON SMES

Andrea Gažová – Zuzana Papulová – Maroš Šlenker

Abstract

Purpose: The purpose of this paper is to outline the new trends, requirements and specifications for measuring and evaluating performance that match the current challenging competitive environment. The paper focuses on exploring the development and new trends in performance measurement and evaluation and on their application on selected sample of SMEs.

Design/methodology/approach: Our research was proceeded during 2018-2019. We focused our research on 204 companies belonging to SMEs in Bratislava region. We used a questionnaire survey to collect data and data were subsequently statistically evaluated. Based on our results, we create recommendations for improvement.

Findings: Based on selected four criteria, we evaluated how current approach to performance measurement and evaluation of surveyed SMEs in Slovakia matches new trends. The praxis of the companies in the terms of application of new trends is still lacking. We found out that more than a half of the companies do not measure performance related to strategy or long-term goals, less of them use evidence of performance results for overall growth and performance improvement and also we could see a positive result, 95% of surveyed companies measure and evaluate financial and non-financial indicators.

Research/practical implications: Based on review of the theory development, we have studied and identified trends in performance measurement and evaluation and examine their application on selected SMEs from Slovakia. We create some suggestions to improve the approach of SMEs based on our research. We believe that if companies are using mentioned criteria, they can improve their approach to performance measurement and evaluation to create more relevant performance measurement system fitting to the current environment.

Originality/value: We present the original research and outline current findings on the approaches of SMEs towards performance measurement and evaluation in Slovakia with the intention to provide their managers with suggestions for improvements.

Keywords: performance, performance measurement, performance evaluation, SMEs

JEL Codes: L10, L25, M11

Introduction

The importance of measuring and evaluating performance as well as choosing the right approach to performance management have been already subjects of the academic research (e.g.; Neely, 2002; Radnor and Barnes, 2007; Kaplan and Norton, 2007; Grafton et al., 2010, Kohlbacher and Gruenwald, 2011; Malagueño et al., 2017).

Managers need to have information about the performance of their businesses, so they can objectively evaluate the status and the results of the business activities to make quality decisions. However, we still might encounter with different perceptions and understandings of the term performance. Neely et al. (2002) defined performance as the efficiency and effectiveness of targeted action, Veber et al. (2009) distinguished it as a general measurement of the individual or group effort and Lesáková (2004) characterized the business performance as the ability to achieve the desired effects or outputs, if possible, in measurable units. In general, measurement and evaluation of performance provide managers with information about organization's ability to capitalize used resources to achieve set objectives. Information about performance is important while considering course of business and its ongoing development. In accordance to enhancing the competitiveness or fulfilling customer demands, it is vital to achieve the best possible level of performance.

In order to ensure the company's performance, the question of monitoring or measuring of the performance emerges. There are several methods and techniques that define what to measure and how to measure and evaluate enterprise performance. The theoretical part of the paper summarizes the development in performance measurement and evaluation toward new trends. Next part presents the results of our research, in which evaluate and discuss approach of SMEs. The conclusion will summarize our main findings and recommendations.

1.   Literature review

The development of management theory, and consequently of the theory of performance measurement and evaluation, can be divided into three main periods (Radnor and Barnes, 2007), characterized by certain features and approaches.

The first period can be dated to the early twentieth century. For this period, the use of concepts such as division of labor and specialization, centralization and hierarchy of commands or mass production were typical. (Wojčák et al., 2017) During this period, the first management theories scientific approach emerged. These theories responded to the rapidly evolving industrial production and their rational approach enabled to improve the working methods, design of organizations or working conditions of employees, who were additionally remunerated according

to their performance. These enabled an increase in the overall productivity of enterprises. (Wojčák et al., 2017) A significant impact was made also by DuPont Corporation, which is considered as the founder of financial performance measurement with its analytical system focusing on three critical elements of the company: operational management, asset management and capital structure. (Neely, 2002). DuPont model is considered as a useful framework for decomposition of financial results and as a good tool for understanding how operating, financing, and investment decisions influence financial performance. (Blumenthal, 1998) It also allows analyzing the potential how to improve financial performance by concentrating on variables which have the greatest impact on this performance. (Melvin et al., 2004) Despite great contribution and popularity, Taylor's scientific approach or DuPont's analysis were not impeccable and later criticized as not considering non-financial performance indicators, as well as for its short-term orientation. (Kaplan and Norton, 2007)

In the second period, which can be classified after World War II, business management was also influenced by social, geographic, economic or technological changes. The previous position of American style of management had started to be threatened by the tough competition of Japanese companies (Wojčák et al., 2017). Japanese management contributed to management theory with several optimization techniques, systems and methods (e.g. Ringi, Kanban, Kaizen, TQM). The focus of performance was to ensure to deliver goods and services in the required quantity and quality. Therefore, many programs have been adopted in companies to increase labor productivity, organization of production, industrial rationalization, quality control of production and product quality enhancement (Radnor and Barnes, 2007). Managerial approaches during this period began to use possibilities of IT, and other performance indicators such as quality, flexibility, timeliness or innovation.

The third period is the most significant shift in development of performance measurement and evaluation. This period can also be defined as the beginning of the revolution in performance measurement and evaluation (Radnor and Barnes, 2007) that was caused by increasing dissatisfaction of managers and specialists with traditional approaches to measuring performance based only on accounting and financial results. Many of researches (e.g. Kaplan and Norton, 2005; Grafton et al., 2010) suggested to managers to use the multiple financial and non-financial performance indicators inside the performance measurement system. Frequent criticism of performance management based on financial indicators is primarily directed at the short-sightedness of such process, as financial indicators often lead managers to short-term decisions affecting immediate performance without a clear link between financial indicators and a long-term strategy (Kaplan and Norton, 2007). The need for a more relevant, integrated,

balanced, strategic and dynamic performance measurement system was emphasized by many authors (e.g. Kaplan and Norton, 2007). The new approaches also emphasize monitoring indicators that reflect value creation or lead to the increase of innovation and support implementation of innovation (Kohnová and Papula, 2017) or suggest the business processes management orientation (Kohlbacher and Gruenwald, 2011). The development of business process management has significantly contributed to the emergence of methods and concepts based on a process approach, such as Activity Based Costing (ABC), Balanced Scorecard (BSC), and Business Process Reengineering (BPR).

Part of our research was at first to examine views of various studies and experts on performance measurement and evaluation on current trends and recommendations (e.g. Neely et al., 2002; Kaplan and Norton, 2007; Perego and Hartmann, 2009; Grafton et al., 2010; Kohlbacher and Gruenwald, 2011; Ladeira et al., 2016; Malagueño et al., 2017). Based on theoretical examination, we have identified the most important criteria for measuring and evaluating performance that match the current challenging competitive environment as follows: (1) *alignment with strategy of organization*; (2) *contribution to the continuous improvement of the organization and its processes;* (3) *link to stakeholder satisfaction*; (4) *balanced performance indicators and combination of both financial and non-financial indicators in mutual interconnection*; (5) *assurance of dynamic adaptability and rapid adaptation to change*; (6) *depth and width, in terms of the level of details and range of activities included in the system to set a holistic view of the organization*; (7) *examination of causal relationships, not just performance results, and also allowance of regular feedback on the organization's strategic goals*; (8) *comprehensible and easy application and administration*; and (9) *process orientation, evaluation of processes performance and application of business process management.* As SMEs are often limited with capital, human resources, managerial capacity and experts in this area and often fail to see the benefits of performance measurement system (Länsiluoto et al. 2019), we chose to examine their approach to these trends.

The aim of our research is to evaluate the current SMEs approach to measuring and evaluating performance in relation to selected identified trends. For the purpose of this paper, we chose four criteria (from about mentioned criteria): alignment of performance measurement and evaluation with the strategy; contribution to continuous improvement of the organization and its processes; combination of financial and non-financial performance indicators and interconnection of performance indicators.

2.   Research methodology

In the literature review, we outlined the development of approaches to performance measurement and evaluation. Based on theoretical examination, we have identified the most important criteria to be considered to match the current challenging competitive environment and new trends.

For our examination of approach of SMEs, we chose four criteria: (1) alignment of performance measurement and evaluation with the strategy; (2) contribution to continuous improvement of the organization and its processes; (3) combination of financial and non-financial performance indicators and (4) interconnection of performance indicators. We used a questionnaire survey to collect data with 22 questions and 4 sections to get understanding of the approach of SMEs in selected four areas mentioned earlier. Our research was proceeded during 2018-2019. We focused our research on companies belonging to SMEs in Bratislava region. We obtained contacts for SMEs from Slovak database of companies – FinStat (www.finstat.sk) and randomly selected 5000 SMEs (there were 559 841 of SMEs in Slovakia in 2018, selection was around 1%). Questionnaires were created using Google Forms and were distributed sequentially through the online marketing tool MailChimp during October 2018-March 2019. We received responses from 204 SMEs, resulting in a rate of return of 4%. In order to understand the specific behavior of our sample, we classified our sample based on company size, company age and sector classification (Tab. 1).

Tab. 1: Research sample and its distribution by size, age, sector

Company size	Number	Sector	Number
Micro	92	Traditional manufacturing industries	70
Small	74	Service sector	112
Medium	38	Education sector, R&D,	20
Company age	Number	Consultancy	
less than 1 year	2	Non-profit organization,	2
1-3 years	14	public service	
3-5 years	23		
5-10 years	57		
more than 10 years	108		

Source: Authors.

The collected data were subsequently statistically evaluated in MS Excel (arithmetic means, absolute and relative frequencies) and RStudio (non-parametric tests). Data were processed through two programs: MS Excel and RStudio. MS Excel was used to calculate

arithmetic means, absolute and relative frequencies, and to display results in tables and graphs. RStudio was used to calculate two non-parametric tests.

Statistically significant differences between the probability of measuring the performance indicators and the size, age, and sector of the companies were tested using non-parametric Kruskal – Wallis test with significance level α = 0.05. Since the Kruskal-Wallis test does not identify where exactly the statistically significant differences occur, or how many pairs of groups are different, and the non-parametric post-hoc Dunn's test was applied to pair the groups.

3. Results and discussion

This chapter will present results of our major findings. We present the main findings in form of percentage of SMEs from our sample (presented in Tab. 1).

3.1 Alignment of performance measurement and evaluation with the strategy

According to our findings, only 38% of enterprises in our sample measure performance related to strategy or long-term goals. Almost half of SMEs (49%) use results of performance for strategic decision-making and strategy creating. A slightly smaller percentage of companies (41%) considers the importance of their performance results and responds with measures at the strategic level. Only 9% of all SMEs have aligned their business processes and their performance with strategy implementation.

These results point to substantial gap and misunderstanding of the role of performance measurement. Insufficient alignment of performance measurement and strategy can cause failure to achieve the expected results. It can also create barriers to strategy implementation and understanding how to implement strategy. Alignment of strategy and performance measurement is particularly important in SMEs. These enterprises do not have a formalized strategy, and the implementation of performance measurement systems can support defining or formalizing their business strategy. As Perego and Hartmann (2009) stated, the alignment of performance measurement system with its strategy is widely advocated as a guiding principle in design of control system.

Mostly small companies with the age more than 10 years from the traditional industry stated that the strategy has high impact on the performance improvement.

3.2 Contribution to continuous improvement of the organization and its processes

We found out that only 55% of SMEs in our sample use evidence of performance for overall growth and performance improvement. SMEs mostly use the performance results for improvement in following areas: 46% for improving product quality and customer satisfaction, 32% for overall improvement; 30% to improve customer/supplier relationships and 26% for

innovation and technological progress. From negative perspective, 17% SMEs do not use performance results for any further improvements; and 15% even do not record any evidence.

We also examined to what extent measurement and performance assessment allows regular feedback, considering past performance, standards and other business areas. We found that: 65% evaluate and compare their current results with the results of previous periods, 38% evaluate and compare the results with the established values or standards, 14% assess and compare results with competitive performance and 8% to ensure general standards and norms.

In this area, we also think that the potential for improvement connected to the performance results is not fully explored and used in SMEs. Some of the results show that companies are using their performance results for improvement in several areas like improvement of product quality, customer satisfaction, improvement of relations with customers and suppliers or innovation and technology progress. As performance measurement systems should support and promote continuous improvement of the company and its processes, this is still the area of improvement in SMEs. Performance measurement systems should allow them to collect data that quantifies the effectiveness and efficiency of business activities and help to judge how to react and plan improvements.

3.3   Combination of financial and non-financial performance indicators

SMEs from our sample measure and evaluate different areas of indicators, both financial and non-financial (Fig. 1). Mostly, it is financial performance (93%), which is highly combined with employee performance (80%) and performance of the production or service process (78%), customer performance (77%), supplier performance (69%) and performance of other processes (69%). Enterprises use only financial performance indicators in 3%, while both (financial and non-financial) in 95%, which shows positive approach of SMEs.

Fig. 1: Areas of performance indicators
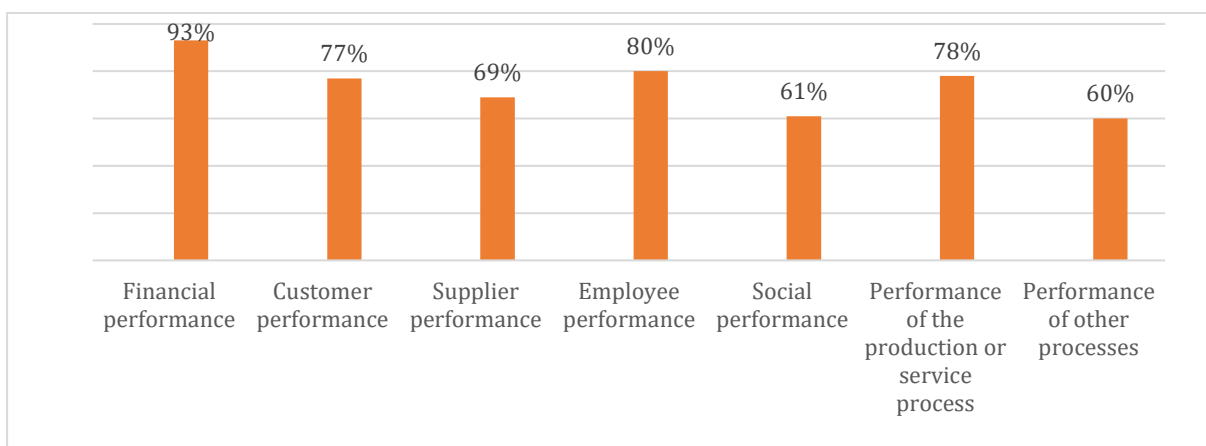
Source: Authors.

We also studied frequencies of performance measurements (financial and non-financial measures) using the Kruskal-Wallis test and Dunn's test. In terms of company size, there was a statistically significant difference between the company size and the frequency of financial (H=9.536, p<0.01), social (H=9.959, p<0.01) and production and service process performance measurement (H=6.006, p<0.05). The difference in the frequency of measuring performance was mainly between micro (once per week) and small / medium-sized enterprises (once per month). In terms of the frequency of the production process or service process, the difference was mainly between medium-sized (once per week) enterprises and micro / small-sized enterprises (once per month). We did not find any statistically significant differences in other areas. The frequency of measurement was on average once a month. In terms of company age, we found a statistically significant difference between the company age and the frequency of social performance measurement (H=18.292, p<0.01). The enterprises under the age of 10 years measure s performance on average once a month, while enterprises over 10 years on average once a year. In terms of company sector, we found out that there is no statistically significant difference.

3.4   Interconnection of performance indicators

We found out that only 15% of SMEs from our sample have interconnected results of performance evaluation; there is a correlation and continuity of performance indicators. This means, that the selected performance indicators in each enterprise are intertwined and interdependent. As a result, 85% of enterprises measure and evaluate performance indicators individually and do not relate, e.g. to customer and supplier performance. Within the organization's level of management, measurement and performance evaluation are mostly linked to the operational level (short-term goals and day-to-day activities) at 45% enterprises.

Respondents reported that measurement and performance evaluation are closely related at tactical and operational level, 38% on strategy and 37% on tactics. This means that more than two thirds of enterprises have linked measurement and performance ratings for medium to long-term goals. We also found out that the results of measuring and evaluating performance are linked to the remuneration and motivation of employees at 41%, to business processes at 28% and to the organization's internal information and communication system at 17%. The linkage to remuneration system dominated in micro and small companies, with the age 5-10 years of existence and mostly operating in service sector.

Performance indicators allow concrete specifications of the milestones; they guide the organization ensuring that it becomes more effective and more competitive. The

interconnection of strategic decision making with key performance indicators helps organizations to make strategic decisions at all levels. Therefore, it is necessary that the relationships of all business areas are monitored and measured by selected indicators.

Conclusion

New trends have emerged in the area of performance measurement and evaluation, e.g. the need of process orientation, alignment of performance to strategy and strategic goals or mapping the causal relationships between performance indicators. In total, we have identified nine important criteria or recommendations of modern performance measurement systems and chose four to evaluate their consideration and application in SMEs. According to the research results, we came to the following conclusions.

To evaluate application of alignment of performance measurement and evaluation with the strategy, we found out that less than half of SMEs in our sample apply this principle. The rest of them do not measure performance related to strategy or long-term goals, do not use the results of measuring and evaluating performance for strategic decision-making and strategy development or do not align their business processes and their performance with strategy implementation. Also, there can be a problem of non-existing strategy in these companies. To implement this criterion, we have several recommendations. As first to start with definition of strategy in connection to performance measurement. A good performance system can support developing and/or formalizing the business strategy and help in executions and control of desired performance.

To evaluate how performance evaluation is contributing to the continuous improvement of the organization and its processes, we found out that only 55% of SMEs use evidence of performance results for overall growth and performance improvement. The areas for improvement were mostly stated as product quality and customer satisfaction, customer/supplier relationships and innovation and technological progress. We also found out that some companies (15%) even do not record any information about performance. Although we had slightly better results in this area comparing to first criterion, here is also great potential for companies to improve their approach to really use performance results and create performance measurement system that will deliver relevant data which can be beneficial in terms to get improvements.

We also studied if SMEs use combination of financial and non-financial performance indicators and we could see a positive result. Almost 95% of companies stated that they measure and evaluate financial and non-financial indicators. As we mentioned also in the theory review, the most critique of traditional performance measurement systems was the excessive focus on

financial measures. Therefore, the performance models since the second half of the 1980s have focused more on balancing performance indicators, not only on financial but also on non-financial aspects. Balance in performance measurement is particularly important in SMEs. These businesses are characterized by focus on operational and financial measurements, often measuring the performance of only one aspect. A balanced performance measurement system is therefore an important supporting tool, emphasizing the balance of measurement without focusing on financial or non-financial indicators. According to our research, the leading area is the financial performance (93%) which is highly combined with employee performance (80%) and performance of the production or service process (78%). In this area, we recommend finding more areas of non-financial indicators and use techniques that are based on balancing both types of indicators, such Balanced Scorecards or tailor-made solution focusing on needs and specifics of organization.

To evaluate the interconnection of performance indicators, we got again some negative results. We found out that only 15% of SMEs have interconnected results of performance evaluation. This area is also showing a great potential for improvement. The performance measurement system should also quantify the causal relationship between the results and the performance determinants in order to support the strategic review and learning. To define causal relationship is demanding. Different techniques can be used, such as, cognitive maps, tree diagrams and causal or consequential diagrams. Understanding of relationships between results and determinants allows regular feedback and an overview of causal relationships between performance indicators and strategic goals. The research findings revealed approach of SMEs managers to measure and evaluate performance indicators only individually (85%) not considering the causality and interconnection of these indicators. We found a strong orientation to measure performance indicators only at operational level (around 45% of companies) which means to evaluate performance of short-term goals and day-to-day activities without connection to strategic and tactical level.

Limitations and further research

This study revealed some obvious limitations as well. First, the sample size is quite small and did not cover all specific industry areas. Second, our scope is limited to only a few of the many potentially criteria that we discussed in the theoretical part. For further studies it is essential to examine causal relationships, not just performance results, and also allowance of regular feedback on the organization's strategic goals; and to study depth and width, in terms of the

level of details and range of activities included in the system to set a holistic view of the organization. These limitations should be addressed in future studies.

Acknowledgement

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WHAT BUSINESS CHARACTERISTICS ANGEL INVESTORS PREFER WHEN EVALUATING BUSINESS PROPOSALS?

Róbert Hanák

Abstract

Purpose: Entrepreneurs, asking for angel investment, are in most cases rejected in the first step of evaluation by investors who state that their business proposals and ideas are not good enough. By analysing 310 business proposals we tried to identify specific business characteristics and their combination, which were more preferred by investors and led to higher odds and probability of acceptance.

Design/methodology/approach: For structured description and categorization of 310 business proposals we used Canvas methodology. We compared two groups of business proposals (n = 132 in the accepted group vs. 178 in the rejected group) in the occurrence frequency of 44 specific business characteristics trying to find differences between these two groups.

Findings: The difference between accepted and rejected groups was found only in 4 business characteristics from 44 (9%). *Newness, Accessibility, Sales Force, Own stores,* 3 were near statistical significance: *Web sales, Physical resources* and *Production*. Binomial distribution test identified also a difference in the categories: *Partner store* and *Advertising*. But from our data, we can say that in the first step of evaluation investors do not have a general "ideal" business proposal based on the specific characteristics.

Research/practical implications: Entrepreneurs who consider writing business proposals which have a higher probability to be accepted, could use our results and adjust their business proposals accordingly. Specifically, they should think about: 1. Creating something new - *Newness* and less copying others - *Accessibility*, 2. how they will deliver value: more *Web sales*, *Sales Force* and *Partner store*, less *Own store* 3. Rely less on *Advertising* as a source of revenues and being strong in *Production*.

Originality/value: We found little support for specific business characteristics searched by investors when making decisions about acceptance and rejection. From these findings, we can speculate that in the selection process angel investors are looking more for other factors such as broad content of the business plan, principal idea, and quality of the business model, team and not for detailed business characteristics used just as a vehicle for delivering them.

Keywords: business proposal, Canvas, business characteristics, angel investor's decision, acceptance

JEL Codes: L26, L25, G41

Introduction

For most entrepreneurs capital is scarce and it is especially true for entrepreneurs who are just starting their business. Therefore, many entrepreneurs are searching for investors who can provide capital for their companies. Entrepreneurs usually send their short business proposals to investors and they are evaluating them when deciding about investment into the venture.

Because of large losses and in effort to avoid mistakes, angel investors started about decade ago using very rigorous and deeper approach than before (Maxwell, Jeffrey, Lévesque, 2011), therefore there are now several steps of evaluation and only if business proposals are good enough they are allowed to pass to the next level (Carpentier & Suret, 2015). And this trend of more professional approach in angel investors decision making, which is more similar to venture capitalist decision making (Petty & Gruber, 2011) or state agencies (Karsai, 2018), is today even stronger (Mason, Botelho and Harrison, 2019). To save time for both partners, business proposals are in the first step of evaluation short and it is requested not to be longer than a few pages. In that short document the business model is explained and also the basic characteristics of the product/service are mentioned. Evaluation of business proposals is often made in the first step by a gatekeeper and his team, who is one from the group of angel investors responsible for the reducing a large number of the business proposal to a smaller and more perspective group (Carpentier & Suret, 2015, Petty and Gruber, 2011). In the business proposals, entrepreneurs are describing and explaining their business plan, model and also means how it will be reached (Croce, Tenca, Ughetto, 2017). In this step more information about the team, lead entrepreneur and his background, or return of investment are not fully available yet, because they will come in next steps of the evaluation process where they play a critical role in the decision process (Boulton, Shohfi, & Zhu, 2019). For that reason, the business model and the general description of the idea are the basics on which the decision is made. Therefore for business proposal assessment, we relied on methodologies which frequently used for business model evaluation. In that business model entrepreneurs specify what type of market they are aiming for, what is the value of the product/service created, how it will be delivered to customers, also finance and resources among other important issues (Carpentier & Suret, 2015, Petty & Gruber, 2011, Osterwalder & Pigneur, 2010). Gatekeeper and his team decide to accept or reject and that decision can potentially make a new successful company or finish plans and development at the very beginning, therefore it is very important to study and investigate how their decision is made. While there are many scientific studies investigating investors' final decision (Maxwell, Jeffrey, Lévesque, 2011), describing factors

and variables influencing investors' decision, we have only a few studies mapping the whole process. Especially rare are studies investigating the decisions in the first step of evaluation (Petty & Gruber, 2011).

Trying to create a successful company, the entrepreneur has to make hundreds of decisions about market, product, finance, just before writing the business proposal and then incorporate them in a structured and organized way into coherent text (Osterwalder and Pigneur, 2010). For example, entrepreneurs have many options related to particular types of the market such as mass-market, niche market, segmented marked, diversified market, various platforms, just to name some basic market classification.

When they are selecting a particular type of market, type of product/service, specific channels they select, financial decisions, how are these business characteristics viewed by investors? Are these decisions about particular business characteristics influencing the investor's decisions to accept them in the first round or not, and in which specific characteristics? For example, we could ask more detailed questions such as do investors prefer more mass market instead of a niche market, or what specific value proposition such as price, design or performance is more valued? What kind of resources such as human, physical, intellectual financial do they prefer more? These questions could be answered by comparing accepted and rejected business plans in their particular business characteristics. Answering questions about these specific business characteristics could be very valuable for nascent entrepreneurs helping to promote that combination of business characteristics which have potentially the highest chances to be accepted and to avoid dead ends.

Therefore we set as the main goal for this paper as follows: By comparing accepted and rejected business plans, applying for angel investment, in their particular business characteristics, to try identifying investors' preference for specific business characteristics.

Methodology

Data for this paper comes from longitudinal research investigating business plans of nascent entrepreneurs who applied for investment from Slovak Business Angels Network. To better understand decisions and processes in the organization and to analyse a large number of different types of data, the multidisciplinary approach is used and authors with a different

scientific background are working with the data. From this database, several papers were published (Hanák, 2019[2], Hanák and Grežo, 2020 – accepted for publication).

1.   Sample

From March 2015 till June 2017, 332 entrepreneurs applied for angel investment using a standardized web form operated by Business angels' network association. From them, only 310 were in such condition and quality level, which can be used for analyzing. Business angels' network evaluates the business proposals in several steps and in the first step business proposals are evaluated by the gatekeeper and his team. They could be accepted for the next steps of evaluation or rejected. According to these internal processes, from 310, 178 were rejected and 132 were accepted. Author of this paper read all proposals and coded them according to Canvas business plan methodology developed by Osterwalder and Pigneur (2010).

2.   Measures

In this first step of evaluation, we have to rely on that kind of methodology, which was designed for business model evaluation, because information about team, entrepreneur or financial data are not available in this level of evaluation yet. Canvas business plan methodology is the most cited methodology used for the description of business models. It consists of 9 broad business blocks such as *Value proposition* and others, which are then divided into many elements, which we call business characteristics such as *Newness* and others. In our research, we used 8 (except Costs structures) and all elements – business characteristics in these blocks created by Osterwalder and Pigneur (2010) to get finally 44 business characteristics. All building blocks and their characteristics are reported in Tables 1 to 8 listed below in the results section. We compared two groups of business proposals (n = 132 in accepted group vs 178 in the rejected group) in the occurrence frequency of all 44 specific business trying to find differences. By other words, we compared the frequency of occurrence of business characteristics such as *Newness* in accepted group vs *Newness* in the rejected group of proposals. By comparing these two groups (accepted vs rejected) allow us to identify those elements – business characteristics, which are more preferred by angels' investors. To compare two groups we used two methods.

First was the Chi-square test for goodness-of-fit, which we applied at all 44 business characteristics. We decided to report significant differences at two levels of sigma (p-value):

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[2] Paper published at IMES 2019 conference by this author is based on the same database as this paper, but the content of the paper and data are totally different.

0.05 and lower and we describe this group as significant, 0.1 which gives some additional information for the reader, that there is difference between accepted and rejected group in some specific category. In the chapter Results and discussion, we report in tables in the last column Chi-square test for goodness-of-fit. To avoid information overload in the Result section, we decided in case of non- significant results not to report them in detail numbers, but we are using abbreviation n.s. – not significant.

Second, in the business characteristics where the number of cases in the group of accepted or rejected was lower than five e.g. *Segmented market*, we used the calculation of the binomial distribution test were we compared probabilities of distribution. We had 132 accepted business proposals from 310 (42.58%) and 178 rejected (57.42%). Based on these proportions we set probabilities in binomial distribution test as .4258 and .5742 and they are together 1 (100%). Chi-square test for goodness-of-fit is a more robust statistical method than binomial distribution test, therefore we preferred that test in every case when it was possible i.e. more than 5 cases in every group (McDonald, 2009). We calculated comparison of every business category also by binomial distribution test and we conclude that results are almost identical compared to the Chi-square test for goodness-of-fit.

Therefore if the number of units in every group were higher than 5 we report results for Chi-square test for goodness-of-fit and if it's lower then we used binomial distribution test with probabilities of distribution of .4258 and .5742.

Results and discussion

We are reporting our results according to the structure of Canvas methodology. Firstly, we start with Customers segments and we report the results in Table 1.

Tab. 1: Customers segments for all/accepted/rejected business proposals

Customer segments	All		Accepted		Rejected		The difference, effect size
	n	%	n	%	n	%	
No answer	5	1.6%	0	0.0%	5	2.8%	n.s.
Mass market	200	64.5%	81	61.4%	119	66.9%	n.s.
Niche market	104	33.5%	50	37.9%	54	30.3%	n.s.
Segmented market	1	0.3%	1	0.8%	0	0.0%	n.s.
Diversified market	0	0.0%	0	0.0%	0	0.0%	n.s.
Multi-Sided platform/ market	0	0.0%	0	0.0%	0	0.0%	n.s.
Together	310	100.0%	132	100.0%	178	100.0%	n/a

Source: Own research. Note: n.s. – not significant, n/a – not available.

As we can see in Table 1 no business proposals are aiming for *Diversified* or *Multi-Sided Platform* and only one for *Segmented Market*. One third hoping for *Niche Market* and two thirds for *Mass market*. No statistically significant differences between accepted and rejected indicate that angel investors do not have any specific preference for some type of *Customer segments* compared to others. In the next table, we report results for *Value propositions.*

Tab. 2: Value propositions they are offering to customers

Value propositions	All		Accepted		Rejected		The difference, effect size
	n	%	n	%	n	%	
No answer	6	1.9%	0	0%	6	3.4%	n.s.
Newness	170	54.8%	88	67%	82	46.1%	$\chi2\,(1) = 12.99; p < 0.001$, Cramer's V = 0.21
Performance	5	1.6%	1	1%	4	2.2%	n.s.
Customization	16	5.2%	4	3%	12	6.7%	n.s.
"Getting job done"	12	3.9%	2	2%	10	5.6%	n.s.
Design	4	1.3%	2	2%	2	1.1%	n.s.
Brand/Status	0	0.0%	0	0%	0	0.0%	n.s.
Price	4	1.3%	2	2%	2	1.1%	n.s.
Cost reduction	3	1.0%	3	2%	0	0.0%	n.s.
Risk reduction	2	0.6%	1	1%	1	0.6%	n.s.
Accessibility	64	20.6%	20	15%	44	24.7%	$\chi2\,(1) = 4.24; p = 0.04$ Cramer's V = 0.12
Usability	24	7.7%	9	7%	15	8.4%	n.s.
Together	310	100.0%	132	100%	178	100.0%	n/a

Source: Own research. Note: n.s. – not significant, n/a – not available.

As we can see in Table 2 preference for specific *Value propositions* are again not normally distributed. Most of the entrepreneurs – 54.8% were hoping to create something new – *Newness*, second most frequent was *Accessibility* 20.6%. In the group of accepted the business characteristics *Newness* is represented more (67% for accepted vs 46.1%) and this difference is highly significant but with small effect size. For those significant business characteristics, we calculated the odds ratio for a better understanding of their effects. Our results show that if the business proposal was accepted, the odds for relying on *Newness* were 2.34 higher, than in the group of rejected. Therefore from our data, we could speculate that investors, when evaluating entrepreneurs' business proposals, are looking for something new and consider novelty high. Contrary *Accessibility* was quite opposite (15% for Accepted vs 24.7%) and also this difference was significant, but again with near trivial effect size. Those business proposals relying on business characteristics *Accessibility* have an odds ratio for accepted group 0.54 lower than in the rejected group. By other words, those business proposals which were relying on business characteristics *Accessibility* reduced their chances to be accepted to half. Accessibility in

Canvas terminology is defined as bringing existing products/services to customers who had no access to them before. It is directly opposite business approach than newness and results are de facto confirming validity of angel investors' decision making. They accept more frequently those business proposals, which are based on creating something new and vice versa they are rejecting more frequently those business proposals, which are based on repeating already something existing. Using binomial distribution test comparing accepted and rejected groups in all categories we did not find any significant differences except in already above reported categories: *Newness* and *Accessibility*. Very different results were found for business category *Channels* which we report in Table 3.

Tab. 3: Channels through which **they are trying to reach customers**

Channels	All		Accepted		Rejected		The difference, effect size
	n	%	n	%	n	%	
No answer	65	21.0%	24	18.2%	41	23.0%	n.s.
Sales force	25	8.1%	16	12.1%	9	5.1%	$\chi2\ (1) = 5.1,\ p = 0.024$, Cramer's V = 0.128
Web sales	123	39.7%	60	45.5%	63	35.4%	$\chi2\ (1) = 3.21,\ p = 0.07$, Cramer's V = 0.1
Own stores	76	24.5%	18	13.6%	58	32.6%	$\chi2\ (1) = 14.7,\ p < 0.001$, Cramer's V = 0.22
Partner stores	14	4.5%	11	8.3%	3	1.7%	significant*
Wholesaler	7	2.3%	3	2.3%	4	2.2%	n.s.
Together	310	100%	132	100%	178	100%	n/a

Source: Own research. Note: n.s. – not significant, n/a – not available, * groups compared by binomial distribution test.

Comparing *Salesforce* we found a significant difference between accepted and rejected group with small effect size. Surprisingly less than one quarter (24.5%) are relying on *Own store*. All others rely on *Web Sales* or external partners. In the group of accepted and rejected we found that investors accepted more business proposals, which were without *Own Stores* than with it (13.6% for accepted vs 32.6% for rejected) and this difference was significant $\chi2\ (1) = 14.7,\ p < 0.001$, but with small effect size, Cramer's V = 0.22. The odds ratio for relying on business characteristics *Own Stores* were 0,33 in the accepted group. Second, very close to significant difference $\chi2\ (1) = 3.21,\ p = 0.07$, Cramer's V = 0.1 was preference for *Web sales* (45.5% for accepted and 35.4 % for rejected) as channel for interaction with customers. The odds ratio for *Web sales* characteristics were 1.52 indicating that choosing this channel was 1.52 times more frequent in group accepted than in the rejected group. These results indicate that business models which are based on modern ways of delivering value are more preferred than relying on the old model of *Own stores*. In the category *Partner store,* we found significant differences by binomial distribution test. Our results for the binomial

distribution test show that accepted business proposals which were relying on the *Partner store* had proportion .79 compared to the rejected group were was .21 with significance p =.01 for the two-tail test. These findings support previous results indicating that business proposals relying on *Own stores* are less preferred by the gatekeeper and his team contrary to *Partners store* or *Salesforce*.

Tab. 4: Customer relationship with customers for all groups of business proposals

Customer relationships	All		Accepted		Rejected		The difference, effect size
	n	%	n	%	n	%	
No answer	12	3.9%	2	1.5%	10	5.6%	n.s.
Personal Assistance	67	21.6%	26	19.7%	41	23.0%	n.s.
Dedicated Personal Assistance	27	8.7%	11	8.3%	16	9.0%	n.s.
Self Service	73	23.5%	32	24.2%	41	23.0%	n.s.
Automated Services	129	41.6%	60	45.5%	69	38.8%	n.s.
Communities	1	0.3%	0	0.0%	1	0.6%	n.s.
Co-creation	1	0.3%	1	0.8%	0	0.0%	n.s.
Together	310	100%	132	100%	178	100%	n/a

Source: Own research. Note: n.s. – not significant, n/a – not available.

Data in Table 4 indicate that entrepreneurs in our sample preferred somehow distant relationship with customers where two-thirds of them selected automatized services (41.6%) or self-serving (23.5%). As we can see in Table 4 there were no significant differences in the business category *Customer relationship* between groups of accepted and rejected.

Tab. 5: Revenue streams

Revenue streams	All		Accepted		Rejected		The difference, effect size
	n	%	n	%	n	%	
No answer	10	3.2%	3	2.3%	7	3.9%	n.s.
Asset Sale	167	53.9%	75	56.8%	92	51.7%	n.s.
Usage Fee	87	28.1%	38	28.8%	49	27.5%	n.s.
Subscription Fees	11	3.5%	6	4.5%	5	2.8%	n.s.
Lending/Renting/Leasing	1	0.3%	1	0.8%	0	0.0%	n.s.
Licensing	3	1.0%	2	1.5%	1	0.6%	n.s.
Brokerage Fees	12	3.9%	4	3%	8	4.5%	n.s.
Advertising	19	6.1%	3	2.3%	16	9.0%	significant*
Together	310	100%	132	100%	178	100.0%	n/a

Source: Own research. Note: n.s. – not significant, n/a – not available, * groups compared by binomial dist. Test.

In *Revenue streams,* no significant difference between accepted and rejected was found for groups larger than 5 units. But we found in business category *Advertising* that proportion of distribution was not .4258 versus .5742, but in the group of accepted were .16 compared to .84

in the rejected group with p = .002, for the two-tail test. These results indicate that our investors do not prefer advertising as the main revenue stream generator.

Tab. 6: Key resources

Key resources	All		Accepted		Rejected		The difference, effect size
	n	%	n	%	n	%	
No answer	3	1%	0	0%	3	1.7%	n.s.
Physical	142	46%	53	40%	89	50.0%	χ2 (1) = 2.96, p = 0.085, Cramer's V = 0.098
Intellectual	26	8%	14	11%	12	6.7%	n.s.
Human	139	45%	65	49%	74	41.6%	n.s.
Financial	0	0%	0	0%	0	0.0%	n.s.
Together	310	100%	132	100%	178	100%	n/a

Source: Own research. Note: n.s. – not significant, n/a – not available.

Entrepreneurs reported equally important human resources and physical, but angel investors were not preferring (close to significantly) already existing *Physical resources* χ2 (1) = 2.96, p = 0.085, Cramer's V = 0.098. The exact opposite trend was with Human resources – more preferred by investors, but findings were not significant. From data, we can identify a weak trend, which indicates that investors prefer *Human capital* more in the accepted group with odds ratio 1.36, than *Physical* background with odds ratio 0.67.

Tab. 7: Key activities

Key activities	All		Accepted		Rejected		The difference, effect size
	n	%	n	%	n	%	
No answer	5	2%	0	0%	5	2.8%	n.s.
Production	222	72%	101	77%	121	68.0%	χ2 (1) = 2.72, p = 0.099, Cramer's V = 0.094
Problem solving	41	13%	18	14%	23	12.9%	n.s.
Platform/Network	42	14%	13	10%	29	16.3%	n.s.
Together	310	100%	132	100%	178	100%	n/a

Source: Own research. Note: n.s. – not significant, n/a – not available.

The dominant of key activities is *Production* where most of all entrepreneurs planned to produce products or services and it was close to significance χ2 (1) = 2.72, p = 0.099, Cramer's V = 0.094. Relying on Production rises chances to be accepted 1.53. No other significant differences were found.

Tab. 8: Key partnership

Key partnership	All		Accepted		Rejected		The difference, effect size
	n	%	n	%	n	%	
No answer	23	7.4%	6	4.5%	17	9.6%	n.s.
With suppliers and customers	283	91.3%	122	92.4%	161	90.4%	n.s.
Joint ventures	0	0.0%	0	0.0%	0	0.0%	n.s.
Strategic alliances	4	1.3%	4	3.0%	0	0.0%	n.s.
Together	310	100%	132	100%	178	100%	n/a

Source: Own research. Note: n.s. – not significant, n/a – not available, * groups compared by binomial dist. test.

No *Joint ventures* were reported and only four *Strategic alliances*, which rises chances to be accepted and binomial distribution test show close to significant difference for accepted business proposals with $p = .07$ for the two-tail test. All other entrepreneurs reported key partnership with their suppliers and customers. Also, no other significant differences were found for business category *Key partnerships*.

Conclusion

Our findings show that investors are preferring business proposals describing something new – *Newness*, and were rejecting more frequently business proposals based on delivering already used product/services to new customers – *Accessibility*. Our findings are in line with scientific papers which reported that novelty, originality and innovation are highly valued by all types of investors (Croce, Tenca, Ughetto, 2017, Davis, Hmieleski, Webb, Coombs, 2017). The most differences were found in the category *Channels* through which they are trying to reach customers. Investors prefer new modern ways of delivering value to customers such as *Web sales* – near significance and do not prefer older ways such as *Own stores*. Another preferable channel is *Partner store* or external *Salesforce*. These findings support in broader terms ideas that product/service should have global potential, the market should be large and with growth and delivering cost should be low (Zinecker, Bolf, 2015). In the way how revenue streams are generated *Advertising* is the significantly less preferred method for investors. Finally, a business plan which has a stronger background in *Human capital* than in *Physical resources* is more preferable than others, but these results are significant at $p = .085$ level. This indicates a level of development, which is highly valued by investors (Maxwell et. al., 2011). A similar level of significance ($p=.099$) *Production* as a key activity is more demanded by investors. On the other side, when summing our results about differences between groups of accepted and rejected business proposals, we found not many different characteristics. From 44 investigated, the significant difference at $p < .05$ level was only in 4 cases (9 %) plus 3 cases near significance

(p < .1) and all of them were with small effect sizes, Cramer's V were between 0.09 and 0.22. For two business categories: *Partner store* and *Advertising* were used binomial distribution test also with significant differences between accepted and rejected group. In these two categories despite the difference is significant but numbers of units are small (less than 5), we have to take these results with caution.

Combination of significantly different business characteristics is very worthy to investigate for finding out if, for example, *Newness* with *Partner Store* and with *Production* rises chances to be accepted. But in our research, we have a small sample of accepted (n=132) and when we create those combinations we find that only a few cases are creating that combination. Therefore the results of the combination are highly questionable and we do not report them.

Differences between the accepted and rejected group are in general minimal. From these findings, we can speculate that angel investors are in the selection process looking more for other factors such as the content of the business plan (Zinecker, Bolf, 2015), idea and quality of the business model, team and others (Carpentier, Suret, 2015) and not into detailed business characteristics used for delivering them.

Acknowledgement

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URBAN START-UP ECOSYSTEM DEVELOPMENT IN UNIVERSITY-BUSINESS CO-OPERATION

Loretta Huszák – Tim Gittins

Abstract This paper enhances knowledge of start-up ecosystem development by summarizing the experiences of a university-business cooperation activity to demonstrate that experiential learning of university students can be integrated into class-based education.

Purpose: Research on entrepreneurial ecosystems has paid limited attention to the Central and Eastern Europe (CEE) region. From examination of extant literature, it is assumed there is *interdependence between universities and business as prime actors in ecosystems*. The aim of this paper is therefore to examine how such interdependence operates in relation to local entrepreneurship ecosystems by posing the following qualitatively oriented research question: *Can cooperation projects contribute to the development of students' entrepreneurial mind-sets?*

Design/methodology/approach: This single case analysis focuses on student participation in the 2019 'Startup Safari' event with dual aims of 1) providing strategic guidance for future development of local entrepreneurship ecosystem and 2) enhancing student's entrepreneurial mind-set through active social capital development. This constituted research through semi-structured expert interviews and event data collection to provide an initial basis for future academia-ecosystem cooperation projects with a wider remit whereby specific aspects of the ecosystem may be examined in greater depth. This is planned for Startup Safari 2020.

Findings: The 2019 project was run on a pilot basis with the main finding that experiential learning can contribute to the development of students' entrepreneurial mind-sets. The cooperation event mostly reached people aged under 30 including university students, interested in innovation. The high number of participating corporates, aiming to recruit talent and develop human capital, but primarily not to cooperate with start-ups, was also notable.

Research/practical implications: The pilot project provides a conceptual basis for ongoing development of pedagogical rationale for entrepreneurship courses in relation to local ecosystems in the CEE region as well as actively enhancing student entrepreneurial mind-sets.

Originality/value: This case study of entrepreneurial learning activity outlines how students may participate in cooperation projects and enhance their own entrepreneurial skills. It may be used as a template for comparison of ecosystem development in the CEE region.

Keywords: ecosystem development, start-ups, academia-business collaboration

JEL Codes: O30, O31, O32.

Introduction

Local ecosystems in which entrepreneurs predominantly operate have been transformed by significant digital-technological development on a global scale in the past decade. Conceptual development of entrepreneurial ecosystems has emerged in parallel with this process. One argument asserts that they form *a regional economic development strategy that is based around creating supportive environments to foster innovative start-ups* (Spiegel and Harrison, 2017). As such, *social capital* is integral to this process whereby business value is generated to mutual advantage through formal or informal contact between individuals in the form of networking (Napathiet and Ghoshal, 1998). *Human capital* by contrast entails the usage of skills, knowledge and capabilities possessed by workers in order to enhance potential for and realisation of economic output (Becker, 1964). While both concepts are difficult to define in terms of measurable tangibility, they are essential to the existential functioning of ecosystems in terms of provision of a conceptual basis for networking events such as Startup Safari.

On such a premise it may be argued that ecosystems generally tend to possess a predominantly *urban* character due to the scale and frequency of human interaction. Entrepreneurship may also be regarded as the output of such ecosystem engendered interaction (Ács et al, 2017; Bonnet, Dejardin and García-Pérez-de-Lema, 2017).

This paper proceeds by initial consideration of theoretical perspectives on entrepreneurial ecosystem development with specific emphasis on the role of universities. This is followed by examination of the nature of local entrepreneurship ecosystems in a CEE transitional context with emphasis on the respective roles of human and social capital. Finally, evaluation of the impact of the Startup Safari event in Budapest upon the local ecosystem and in particular on the development of university students' entrepreneurial mindsets is used as a partial basis for further research.

1.   Entrepreneurial Ecosystem Theory and Universities

Triple Helix theory as outlined by Etkowitz (2003) embodies the integral role of universities in the form of *knowledge provision* to an ecosystem through research activities and the *provision of human capital* by graduates and students. Hence universities might be seen as supplying inputs to private business which drives entrepreneurship, with state-based institutions acting as the third element of the Triple Helix system by providing regulatory direction for an ecosystem.

While the content of entrepreneurship education should ideally respond to ongoing environmental forces, a perennial debate persists as to the extent to which entrepreneurship can be taught in a class-based environment as opposed to focusing on experiential learning-based

methods (Kolb, 1984). A growing body of evidence has emerged regarding the nature of entrepreneurial education. In a case study-based paper of an ecosystem incorporating the University of Chicago (Miller and Ács, 2017), it is proposed that the university itself acts as an ecosystem. Johnson, Bock and George (2019) also examined university focused ecosystems in Scotland and the United States to suggest ecosystem development as such may evolve through the provision of purpose-built facilities housing incubators. Ecosystems can also offer various non-class based activities for students to foster social capital growth and entrepreneurial mind-set development. Thus skills, typically encountered in running start-up businesses such as resource allocation, may be simulated to varying extents in ecosystem-based student assignments (Gargouri and Naatus, 2019).

Higher education institutions generally offer three basic types of resources related to entrepreneurship education: lectures and seminars on different topics; networking and coaching opportunities, and scientific research resources for founders and entrepreneurs. A multi country European based study demonstrated that participation in entrepreneurship education has a likely positive impact on entrepreneurial intentions, both immediately after studies and five years later (Küttim, Kallaste and Venesaar, 2014). While there seems to be no definite pattern of how lectures and seminars are delivered pedagogically in efficiency and innovation-driven countries[3], networking and coaching opportunities in general are much more established in innovation-driven economies such as the USA (Miller and Ács, 2017). Tangible resources for founders and entrepreneurs in the form of governmental support for instance, seen to be more available in efficiency-driven countries such as in the CEE region (Ranga, 2014).

In practical terms, incubators are perhaps the most viable means of transmitting extra-curricular entrepreneurial learning in terms of providing support in tangible resources (Theodoraki, Messeghem and Rice, 2018). However, the extent of integration of innovative assignments and activities into entrepreneurship classes in terms of developing entrepreneurial mind-sets of students, seems in the case of the CEE region and Hungary in particular as the focus of this paper to be somewhat underdeveloped as examined forthwith.

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[3] The GEM classification of economies by economic development level is based on phases set out by the World Economic Forum (WEF) in its Global Competitiveness Report. According to the WEF classification: factor-driven economies are the least developed. They are dominated by subsistence agriculture and extraction businesses, with a heavy reliance on (unskilled) labor and natural resources; efficiency-driven economies are increasingly competitive, with more-efficient production processes and increased product quality. Innovation-driven economies are the most developed, with more knowledge-intensive businesses.

2. Entrepreneurship in the CEE Region

CEE countries have long been centrally placed in Global Entrepreneurship Index (GEI) rankings with most recent data from 2018 indicating status of their relative rankings (Global Entrepreneurship Index, 2018). Given that the CEE region mostly consists of former COMECON member states in Eastern Europe, it might be assumed that entrepreneurial instincts were largely suppressed during period of central economic planning before economic 'transition' began around 1990. Such instincts have re-emerged alongside relatively strong IT and digitally focused technological developments of the intervening period. Moreover, cognitive perspectives towards entrepreneurship may have been determined in the pre-transition period by a syndrome of '*institutional embeddedness of entrepreneurial behaviour*' (Welter and Smallbone, 2011), whereby viability of enterprises with the state often as the sole customer depended on the relative strength of connections with actors in institutions such as ministries on either a formal or informal basis. Arguably, this has persisted into the transition period and is accompanied by the *existence of a substantial informal economic sector*, whereby some small businesses may operate in semi-legal circumstances given the existence of a lack of institutional focus on markets in comparison with more advanced Western European economies revealed by the transition process (Williams, 2014).

Historical factors inherited from the centrally planned system could also be responsible for the generally *strong levels of technical and engineering skills and a lack of managerially oriented human capital in the region*. (Szerb et al, 2017) However, entrepreneurial traits, which pre-existed the centrally planned era, have arguably re-emerged. Central planning emphasized the provision of goods and services for mass public consumption which may arguably be associated with an abundance of technically oriented human capital in the CEE region as noted by Földvári, and van Leeuwen (2005). This aspect was also noted by Jurajda and Terrell (2010), who also pointed to a relatively low level of entrepreneurial inclination in the region which would in turn infer central economic planning may have effectively retarded entrepreneurial instincts.

Moreover, 'institutional embeddedness' (Welter and Smallbone, 2011) might encapsulate *hierarchically or 'vertically oriented' social capital* formation whereby connections are made between state-run organisations acting as quasi-oriented 'businesses' and institutionally based actors. This contrasts with 'horizontally' oriented social capital, featuring contact between actors on a relatively egalitarian basis (Andrews, 2012) and arguably is still a dominant feature

of social capital formation in the CEE region some three decades after the beginning of the transition process.

With regard to human capital, accession to the EU of various CEE countries entailing free movement of labour has taken place in parallel with greater virtual contact enabled by IT-based technology. Thus, human capital within the CEE region is arguably more directly exposed to virtually enable market-oriented norms and social capital may acquire a relatively horizontal onus conducive to entrepreneurship. The latter factor was noted in a qualitative study of return migrant IT focused entrepreneurs in Hungary who have worked and studied abroad extensively (Gittins, Lang and Sass, 2015). However, this aspect alone is insufficient in terms of offering evidence for the nature of entrepreneurship ecosystem development in the CEE region. Brooks, Vorley and Gherhes (2019) conducted qualitative research with various stakeholder groups in Poland as the largest CEE country and concluded there was *insufficient self-identification as entrepreneurs but rather as self-employed persons and a tendency to become employees of larger organizations/corporates.*

In addition to the general status of entrepreneurship in the CEE region a relatively heterogeneous state of development of Triple Helix based ecosystems within the CEE region was observed by Ranga (2014). This observation provides a partial basis for consideration of ecosystem development in Budapest through means of the student pilot project with the Startup Safari event. While such networking events are focused on development of innovation driven enterprises, their effectiveness in terms of enhancing wider ecosystem development, is viewed in the context of the wider environment in the CEE region as depicted in Figure 2:

Figure 2: Common characteristics of entrepreneurship in the CEE region

Source: Authors' own illustration.

3. The impact of the Startup Safari event on the local entrepreneurship ecosystem

Budapest is considered as an urban entrepreneurial ecosystem as the capital city of Hungary forming the prime focus of economic activity in the country. There is no extant research on ecosystem development in Budapest itself, although Jáki, Molnár, and Kádár (2019) described the city as an entrepreneurial ecosystem through a wide-ranging survey of various stakeholders including venture capital providers, state-based actors and entrepreneurs. Most entrepreneurs surveyed were middle-aged males who had previously failed in business ventures and would prefer to identify as entrepreneurs rather than as employees. This would infer an *increasing degree of entrepreneurial orientation* in Hungary.

In recent years Budapest has become a prominent start-up city in Europe and presents itself as a viable location for founders (Trajkovska, 2019) and is acknowledged as a prime attraction for investors and incubators in the CEE region. (PWC, 2019). In the past decade, at least 500 start-ups have been established and operate privately or within recently formed incubators in Budapest. (Tölgyes, 2018), with business plans typically modelled on successful international case studies in the area of innovative enterprise. While this data is not subject to comparison with similar sized cities in the CEE region in terms of overall active population levels, it would nonetheless suggest development of an ecosystem at *nascent level*. (Bonnet et al, 2017) It provides a conceptual basis for exploration of the roles of Triple Helix based stakeholder entities within the putative urban entrepreneurial ecosystem in Budapest.

Birkner, Máhr and Berkes (2017) and Huszák (2019) conceptualised and applied the Triple Helix model to universities throughout Hungary and suggested emphasis on innovation in terms of R&D may drive development of an innovative ecosystem through contractual arrangements between higher educational institution and external stakeholders. Following this rationale, Corvinus University Budapest is assumed to be suitably representative of the higher education element of the Helix. The university is historically established as a prime provider of management education in the city and has a Small Business Development Centre with teaching approaches which evolve based on application of experiential learning.

Various networking events are organised in the city whereby actual and potential entrepreneurs may meet venture capital investors and other related stakeholders, thus in essence generating social capital development. Launched in Berlin in 2012, Startup Safari, a showcase of local start-up culture has by now been organized in more than ten cities across Europe every year. The Budapest event has been held annually since 2016 with the aim of enhancing

entrepreneurial activity. The Budapest Startup Safari has the mission of familiarizing attendees with the local ecosystem as well as promoting knowledge sharing and furthering networking opportunities for market participants.

The main target groups consisted of current and future entrepreneurs, innovators and other interested stakeholders specifically concerned with the longer-term development of Budapest's start-up ecosystem. (Startup Safari, 2019). One of the main findings of the research project was that around 50 per cent of the attendees were aged under 30. This may appear to be relatively high, yet reasons for younger audience attendance would need to be compared with data from other Startup Safari events held elsewhere. At this point it remains a hypothetical presumption that younger adults, including students attend as a means of exploring employment opportunities as well as forming start-up enterprises themselves.

Moreover, valuable qualitative data was collected through three semi-structured, guideline-based expert interviews conducted with organisers of the event as key players in the Hungarian start-up ecosystem. The research has shown that the 2019 Budapest event attracted around 4,000 visitors, within which 320 presentations were given in different locations. This would appear to suggest high levels of attendance, however it should be considered that 9800 places were booked. Interviewees confirmed that although the event had a surprisingly high number of total visitors, some events were relatively poorly attended.

Ninety per cent of the organisational budget of the event was covered by corporate sponsors. The research results indicate that such stakeholders attended the event not primarily with the aim of cooperating with local start-ups, but rather for the purpose of *finding skilled and capable human capital*. This would accord with the observation that there is an abundance of technically oriented human capital in the CEE region, including Hungary. In this regard, start-ups and entrepreneurial undertakings compete with corporates to provide employment options for available human capital.

A further prominent finding corroborated the observation that start-ups which receive external funding are more likely to remain active in their city of origin as noted by Brigl at el., (2019) and Karsai, (2012). It thus may be inferred from the research data that participation at such events by university-supported start-ups may have enhanced opportunities to access initial funding sources and further mentoring, or to participate in accelerator programmes.

In accordance with a focus upon experiential learning as instigating entrepreneurial inclinations in students, the Startup Safari project provided an ideal means of integrating class-based knowledge with actual 'real world' experience. Student participation thus acts as a basis for future development of similar networking events in subsequent years and to also provide an

initial template for university-business co-operation projects in other urban ecosystems in the CEE region sharing similar 'efficiency driven' characteristics to that of Budapest. In 2019, master level students of Corvinus University were tasked with cooperating with local organisers of the Startup Safari event to provide insights into the nature and scope of the local start-up ecosystem. Throughout the course of the cooperation project, the students accumulated first-hand experience with start-ups and with other prominent stakeholders active in the local start-up ecosystem.

With reference to the aim of using data to provide guidance for the marketing of future events, students visited offices and co-working spaces of start-ups, tech companies and accelerators, and attended various events within the Startup Safari framework. They were specifically tasked with creating a draft strategy for targeting future university students as potential attendees with the aim of developing their entrepreneurial mind-set. The main strategic recommendations made by students included the following:

- Placing limits on the number of provided events in order to focus more deeply on topics which potentially attract higher numbers of attendees.
- Promotion of future events more effectively through use of student associations and personal leads.
- Use of informal channels to contact potential future attendees.
- Development of an online promotional pack for online advertising with recommendations on means of accessing current students as potential future entrepreneurs.
- Use of an online questionnaire for future event registration of potential attendees accompanied by regular submission of social media posts and newsletter bulletins.

The delivered recommendations were described by the experts (event organisers) at the interviews as 'entrepreneurial' and 'concrete' in terms of combining the 'big picture' academic perspective with tactics deployed in practice. The experience of the pilot project indicates therefore that *activity-based pedagogic models can effectively contribute to the development of students' entrepreneurial mind-sets.* With reference to the research question posed in the purpose of this paper, it can be suggested that allocating research-oriented tasks to students through participation in networking events may serve to enhance their own social capital for future career purposes. Moreover, it informs pedagogical development in that delivery of

entrepreneurship courses should feature increasing placement within ecosystems on a learning-oriented basis to represent movement from classroom based delivery.

Based on the pilot project, a survey of Startup Safari 2020 event participants will take place with a deeper focus on specific stakeholders within the local ecosystem. By use of a mixed-methods research approach consisting of surveys and interviews, it is aimed to assess the impact of university courses upon the local ecosystem and to provide students with opportunities to enhance their research skill levels for further use at dissertation level.

4.   Conclusion

With entrepreneurial ecosystems receiving greater conceptual and empirical attention in recent decades, the Triple Helix model in particular acts as a suitable guide to define the nature of the interdependent relationship between actors within them. While broad ecosystem based principles of stakeholder interaction may operate in practice in various innovation driven and technologically advanced economies, the initial basis of the present analysis is the assumption that universities, business and state-based institutions also act as essential core elements of entrepreneurship ecosystems in efficiency driven economies in the CEE region.

With relatively minimal attention paid so far to ecosystem development in the CEE region, this paper represents a formative attempt to adapt principles of the Triple Helix model to the entrepreneurship ecosystem development as such. However, characteristics of ecosystems in the CEE region sharply differ from those of innovation-driven economies. CEE countries share many common characteristics including the existence of a substantial informal economic sector, and somewhat vertically oriented social capital derived from institutional embeddedness existing alongside relatively horizontally oriented or egalitarian social capital creation modes. Moreover, a strong reputation for technically oriented human capital may be contrasted with a lack of managerially oriented human capital in the CEE region. This background provided a contextual basis for deployment of the pilot project in Budapest.

Outcomes featured in this paper specifically indicate that 1) experiential learning can effectively accompany class-based entrepreneurship education at university level, and 2) that student participation in research activities at networking events can effectively contribute to local entrepreneurial ecosystem development. The 2019 Startup Safari event thus provided an initial basis for active involvement of students in the ecosystem through development of their data collection and critical thinking skills. This is also representative of movement towards non-class based activity, while pedagogy remains embedded in the university system. Experiential learning took place in that students accumulated first-hand experience with start-ups and other

stakeholders active in the local start-up ecosystem by active collection of information. It is however emphasized that as a pilot project, research data which was generated tended to be descriptive in nature and insights for marketing of future events were largely derived from qualitative based expert interviews.

Nonetheless, experience of the pilot project indicates that activity-based pedagogic models can effectively accompany class-based university education as well as effectively contributing to the entrepreneurship ecosystem by students *generating social capital through research activities and developing their own entrepreneurial mind-sets*. On this basis, the 2020 project will place specific focus on the question as to whether participation in networking events and entrepreneurship education has a positive impact on entrepreneurial intentions in later career stages in the context of CEE region based ecosystems. Hence the pilot project outlined in this paper acts to provide a wider and deeper research remit by focusing more closely on stakeholders within the ecosystem.

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A BIBLIOMETRIC ANALYSIS OF THE LINK BETWEEN RISK MANAGEMENT AND PERFORMANCE IN ENTREPRENEURSHIP

Andreea Chiţimiea – Carmen Nadia Ciocoiu – Adina Liliana Prioteasa – Alina Andreea Marin

Abstract

Purpose: Increasing the performance of an organization is an area of permanent interest for both the agenda of the authorities and for organizations of any kind. Therefore, the number of papers published in the specialized literature analysing the factors that contribute to the performance improvement is increasing. The specialists in the field have concluded that effective risk management can influence the performance, both financial and other type. In this context, the present paper aims to highlight the stage of the researches based on the relationship between the risk management and the evolution of business performance in entrepreneurship.

Design/methodology/approach: The study use the bibliometric analysis of the written publications during 1993-2019 and indexed in Web of Science database. For the papers' search in Web of Science were used the words "risk management", "performance" and "entrepreneurship" in topic. The resulting sample were analysed from the point of view of the areas within which researchers are studying risk management and performance in entrepreneurship, the trend in the number of publications from year to year, the most relevant journals, and the most prolific and most cited authors.

Findings: The authors found that most publications are articles in English, in business and economics area. However, there are a significant number of articles in the fields of engineering, operational research and management science, as well as public administration. The Journal of Business Venturing, a journal dedicated to entrepreneurship, recorded the most publications and also a very large number of citations.

Research/practical implications: This study can be useful to researchers and practitioners interested in studying the relationship between risk management and performance in entrepreneurship. Moreover, this research presents the current situation of the researches carried out on the subject and highlights new possibilities to continue the researches, starting from a quantitative analysis of the scientific literature in the field and identify the most appropriate journals to publish the results of their studies.

Originality/value: The study is the first contributions in the field of quantitative analysis of academic literature about relationship between risk management and performance in entrepreneurship.

Keywords: bibliometric analysis, risk management, performance, entrepreneurship

JEL Codes: L25, L26, L29

Introduction

Entrepreneurship is recognised for the contribution to economic growth, jobs and wealth creation. In the same time, many authors link entrepreneurship to risk and uncertainty in decision making, but also with product and process innovation (Veskovic, 2014).

According to Vasquez and Davila (2008, cited in Rey-Martí, Ribeiro-Soriano & Palacios-Marqués, 2016), the entrepreneurship has been studied initially only by economics scholars, seeking relationships with economic growth and addressing entrepreneurship from a purely economic point of view. In recent years there has been an increase of concerns to include the study of performance in the entrepreneurial literature (Ciocoiu, 2014).

In entrepreneurship the concept of performance presents various meanings such as: growth, success, productivity, profitability, yield, result of a financial year, etc. Financial performance is defined by Robu, Anghel & Şerban (2014) as a subjective method of verifying the returns of an enterprise in the use of assets from the heritage in order to obtain future financial benefits. (

Despite this growing interest in entrepreneurship, however, analysis on the relationship between risk management and performance in entrepreneurship is scarce and the quality of research conducted in this area have yet to be determined. This limits research into risk management in entrepreneurship and justifies the need for the present study.

The paper, structured in four chapters (introduction, approaches of the subject in the specialized literature, research methodology and data collection, analysis of the obtained results, conclusions), wants to highlight the extent to which the relationship between risk management and performance in entrepreneurship is studied. This study is done by querying the Web of Science database and extracting relevant information.

The main aim of this article is in line with the purpose of every bibliometric analysis. The authors try to guide researchers who are new in the area of entrepreneurship and risk management, so that they know which journals and authors to consult when studying this phenomenon and which is the most productive journals.

1.   Literature Review

Most entrepreneurs appeal to innovative solutions to be as competitive as possible in the economic market, but most of the time they do not identify all the risks that their business implies (Androniceanu, 2017).The interest shown for risk management systems dates back to the 1990s (Marika et al., 2010). The benefits of implementing effective risk management are manifested in facilitating strategic decisions adapted to market competitiveness (Nocco &

Stulz, 2006). However, due to the diversity and development of the market and the types of companies that operate, there is no standard model for implementing a risk management system and no guide for risk management. The consequence of these shortcomings is the multitude of studies of the researchers who offer different perspectives on the subject.

Regarding the impact of the risk management system on financial performance, the specialized literature highlighted two opinions: some researchers attributed a directly proportional relationship between the financial performances obtained by the companies and the applied risk management system, while others believe that the management of the factors of internal and external can contribute to financial performance (Yang, Ishtiaq & Anwar, 2018).

Further analysis in the specialized literature from the perspective of the factors has found that for the establishment of a strategy it is important for the company to analyse the internal risks as well as the external ones. Analysing the risks from the point of view of the internal factors, there are variables such as the innovation and the company capability to adapt to the new technology, but also the specific factors of the field of activity, the performance of the employed personnel, of the marketing policy and the research and development carried out. These factors influence the position of the company in the market (Kaleka & Morgan, 2017). External factors affect the companies through the competitive advantage, the industry of belonging and the legislative framework (Hanggraeni et al., 2019). Experts argue that for these factors, conducting a Porter-type analysis based on market competitors, ease of market entry, the degree of threat of substitution products, the bargaining power of customers and suppliers reduces the company's positioning to obtain profit or loss (Brustbauer, 2014).

Regarding the researchers who attributed the increase of the financial performances as a result of the implementation of an efficient risk management system, the literature mainly mentions that the predisposition to risk exposure varies according to their evaluator (Hanggraeni et al., 2019). However, the benefits of implementing such a strategy are materialized by reducing operational costs, the increase of the revenues due to the prevention of stock breaks and making investment decisions based on yield (Yang, Ishtiaq, & Anwar, 2018).

According to previous studies, the impact of effective risk management is based on the results obtained and appreciated using the financial performance indicators. More specifically, in the mentioned studies, the risks were identified, the management tools were adapted to the probability of realizing that risk, strategies for dealing with the identified risks were implemented and the impact of these strategies on the market was measured (Hanggraeni et al., 2019). This type of analysis is considered to be estimative because it depends on the risk

perception of the entrepreneur or the specialist in risk management and is strictly correlated with the SWOT analysis of the enterprise for which it is carried out.

As a consequence, the correlation between performance and risk management is a field of continuous research, showing interest mainly due to the effects on the competitiveness of the company in the market, of minimizing losses by establishing an efficient strategy that takes advantage of all opportunities (Yang, Ishtiaq, & Anwar, 2018).

2.   Research methodology and data collection

This paper focuses on connecting risk management with performance in entrepreneurship, as two concepts treated in the vast literature of the last years.

In order to carry out this analysis, the evolution of the published papers on risk management in entrepreneurship and the impact on the recorded performances was followed.

The bibliometric analysis is an appreciation of researchers' interest in a particular field based on a complex data source that provides insight into the time frame in which scientific researchers have given importance to the targeted field. The bibliometric analysis is currently used to highlight the interest on different fields of research such as management, economics, innovation, entrepreneurship (Aparicio et al. 2019; Bartolacci et al., 2019), business etc.

The research methodology comprises the study of the international Web of Science database with the purpose of extracting and synthesizing relevant information from reports based on the number of published studies, the type of paper, the countries of origin, the language in which they were published, publishing author, year of publication, field of publication, industry concerned, but also reports based on the most frequent authors who have dealt with the influence of risk management on performance in entrepreneurship.

The reason for choosing Web of Science is that is internationally recognized for the quality of the papers indexed in this database and because houses scientific documents across all disciplines (Rey-Martí, Ribeiro-Soriano, & Palacios-Marqués, 2016). In addition to that, many of the papers also appear in Scopus, so the analysis is not altered.

After searching the Web of Science for the keywords "entrepreneurship", "risk management", "performance" in the topic, the database has displayed 342 papers published from 1993 to present (January 2020). Applying a filter based on articles, reviews and proceedings paper led to the listing of 339 titles. Within this analysis, however, there was an overlap of three papers that were indexed by Clarivate Analytics as both article and proceedings. In a more in-depth analysis, these were included in the statistics only as articles in order not to affect the analysis and because appear in journals as current issues and not as a special issue.

3. Results and Discussion

3.1 Analysis of the Selected Papers

The analysis based on the 339 publications highlighted an increase in researchers' interest in the correlation between risk management and business performance since 2007, when the number of publications targeting this topic tripled over 2006. In Figure 1 shows the fluctuation of the number of published studies that registered a sharp decrease in 2008 (by 50%) which can be correlated with the economic depression that destabilized the world market and which oriented the interest of the researchers towards other aspects of risk management. At the same time, in the period 2008-2009, 14 papers were published, which highlights the decrease of interest on the influence of risk management in obtaining financial performances.

Since 2013, the number of studies published and targeted in this analysis has reached the highest levels, the interest of the researchers being correlated with the influences of the governments to facilitate the entrepreneurial activity due to the favourable impact on the sustainable development of the economy.

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Fig. 1 Years of publication of the studies
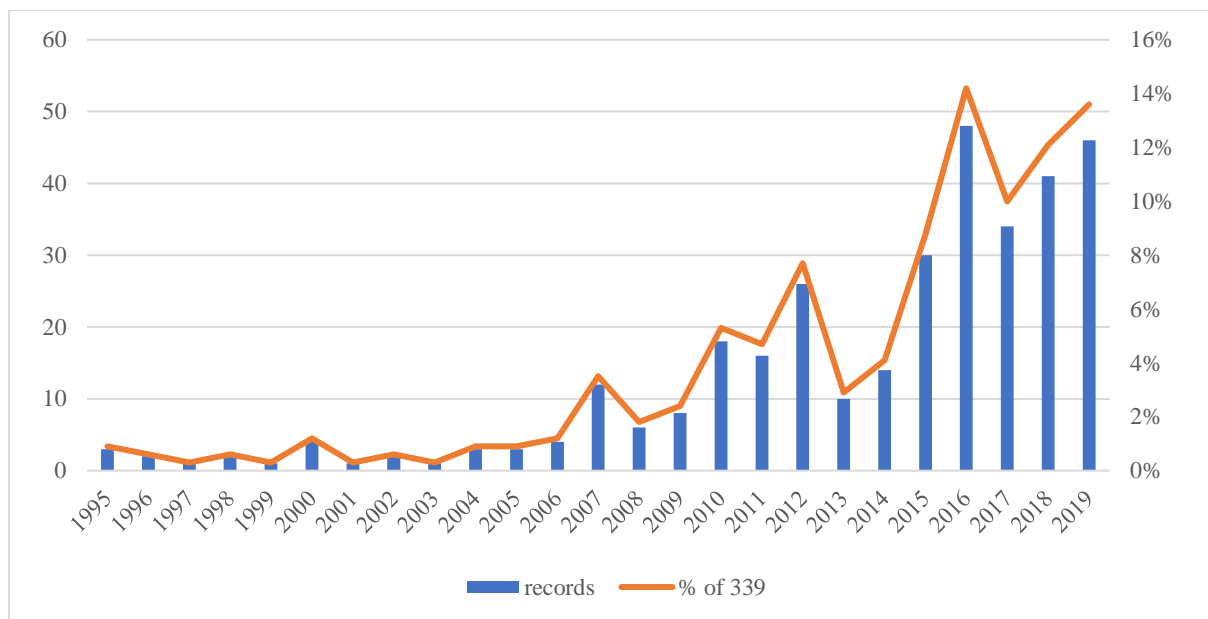
Source: Clarivate Analytics, Web Of Science (2020).

The authors who showed the greatest interest in the field are presented in Table 1. Prof. Kraus Sascha from Durham University Business School and among the 10 most esteemed specialists in the economic field, according to the German journal "Wirtschaftswoche", has published 7 papers. This author has also an article which corresponds at the keywords used in our analysis with 160 citations in Web of Science. The top includes also a professor of strategy, Zahra S. A.., Chair of the Carlson School of Management at the University of Minnesota and Academic Director at Gary S. Holmes Entrepreneurship Center, who has published a number of 6 papers.

Most of the published studies are articles, registering a weight of 82% (278 records), followed by proceedings paper with 12.70% (43 records) and reviews with 5.30% (18 records).

Tab. 1 Distribution of the most published authors (Top 10)

Authors	records	% of 339	Authors	records	% of 339
KRAUS S	7	2.10%	KURATKO D.F.	4	1.20%
ZAHRA S.A.	6	1.80%	LUMPKIN G.T.	4	1.20%
BRETTEL M.	4	1.20%	YANG Y.	4	1.20%
EGGERS F.	4	1.20%	CUMMING D.	3	0.90%
HUGHES M.	4	1.20%	FILSER M.	3	0.90%

Source: Clarivate Analytics, Web of Science (2020).

The leader in the field of research are the United States, whose authors have published 29% of the number of papers analysed. According to Figure 2, The People's Republic of China and Spain have a percentage of 7%, with 22% lower than the weight of the American authors. England and Germany, two of Europe's largest economic powers, account for 6% of all published papers. The regions with the least published authors are Malaysia (2%), Portugal (2%), Turkey (2%), Australia (1%), Belgium (1%), Brazil (1%), Denmark (1%), Iran (1%) and Japan (1%).

Fig. 2 Papers count by country
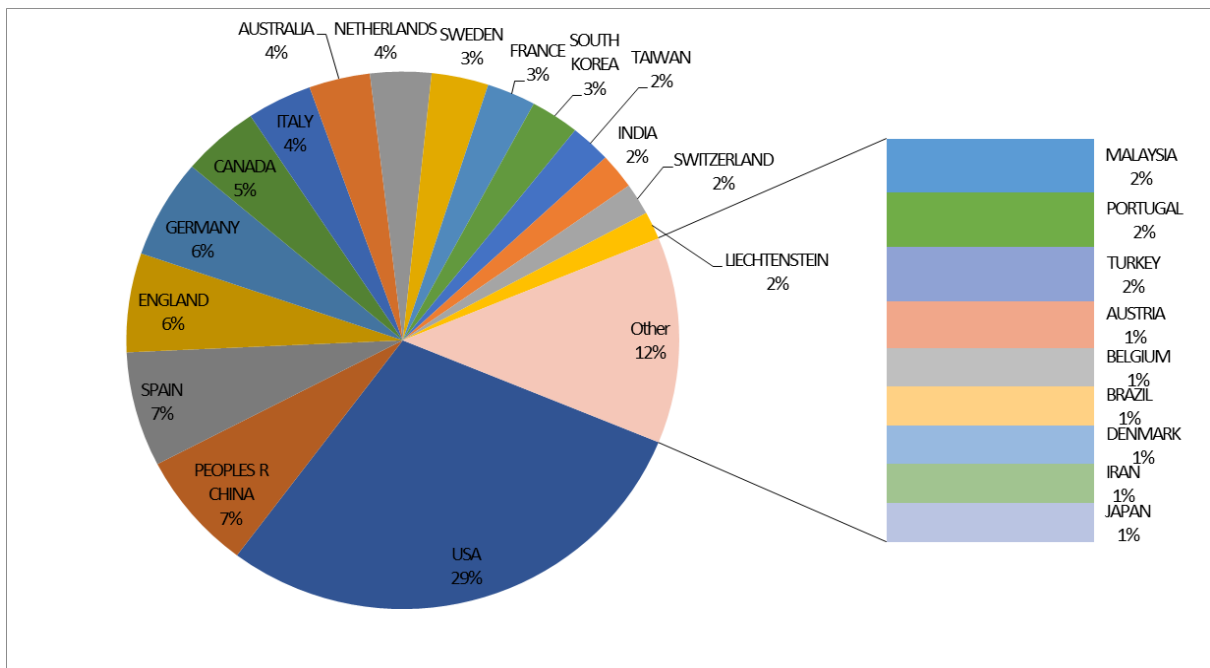
Source: Clarivate Analytics, Web of Science (2020).

At European level, the most interested regions in researching the impact on the financial performance of entrepreneurs are owned by the Nordic and Western countries, which according to studies conducted by the Global Entrepreneurship and Development Institute (organization dedicated to capitalizing on economic opportunities for individuals, communities and nations), hold the higher share of entrepreneurs. According to the collected information, 98.50% (334 papers) of the indexed publications are in English, 0.90% (3 papers) in Spanish, 0.30% (one paper) in Russian and 0.30% (one paper) in Slovak. Regarding the area of research the most published studies deal with topics from the business & economics (67%), followed by engineering (6%), operational research and management science (4%), and public administration (4%). The others fields have weights under 2% in the totality of the published papers. By correlating this information with the Web of Science indexing domains of

publications, we observe that 36% of them focus on management, 32% on business, 6% on economy, 3% on research, engineering and finance, and the lowest percentages are in psychology, production, and electronics.

Of the 339 published papers, 103 of them can be found in Table 2 of the sources of publication.

Tab. 2 Sources of publication (Top 15 journals)

Source Titles	records	% of 339
JOURNAL OF BUSINESS VENTURING	20	5.90%
INTERNATIONAL ENTREPRENEURSHIP AND MANAGEMENT JOURNAL	11	3.20%
JOURNAL OF BUSINESS RESEARCH	10	2.90%
STRATEGIC ENTREPRENEURSHIP JOURNAL	10	2.90%
MANAGEMENT DECISION	8	2.40%
STRATEGIC MANAGEMENT JOURNAL	8	2.40%
JOURNAL OF SMALL BUSINESS MANAGEMENT	6	1.80%
ENTREPRENEURSHIP THEORY AND PRACTICE	5	1.50%
INTERNATIONAL JOURNAL OF ENTREPRENEURIAL BEHAVIOR RESEARCH	5	1.50%
ADMINISTRATIVE SCIENCES	4	1.20%
JOURNAL OF MANAGEMENT STUDIES	4	1.20%
IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT	3	0.90%
JOURNAL OF BUSINESS ETHICS	3	0.90%
JOURNAL OF MANAGEMENT	3	0.90%
JOURNAL OF OPERATIONS MANAGEMENT	3	0.90%

Source: Clarivate Analytics, Web of Science (2020).

The Journal of Business Venturing, a journal dedicated to entrepreneurship published by Elsevier, recorded the most business publications (5.90%), with 3% more than the Journal of Business Research. In the field of management, most publications are indexed by the International Entrepreneurship and Management Journal (3.20%).

3.2   Citation Analysis

The 339 papers selected for analysis recorded 144,234 citations until 2019. Furthering this analysis, we selected the 10 most cited studies and found that the study of the authors Lumpkin & Dess (1996) recorded a total of 3000 citations at the end of year 2019 (an annual average of 125 citations). This article is published by the Academy of Management Review, a journal that is not among the ones highlighted in Table 2. The same authors (Lyon, Lumpkin and Dess, 2000) are also on the 9th place, with 298 citations (an average of 17.53 citations/year) with the

study indexed by the Journal of Management (14th place in Table 2). The next six papers in this top are published by the most indexed journal, Journal of Business Venturing. The author with most publications, prof. Univ. dr. Kraus Sascha, is not among the most cited author, but Prof. Dr. Zahra Shaker holds three papers published by the Journal of Business Venturing and recorded 750 citations (3rd place: Zahra & Covin, 1995) with an average of 31.25 citations/year, 331 citations (6th place: Hornsby, Kuratko, & Zahra, 2002) with an average of 20.69 citations/year and 327 citations (7th place: Zahra & Garvis, 2000) with an average of 18.17 citations/year (Table 3).

Tab. 3 The 10 most cited papers of the period 1993-2019 (Top 10 citation studies)

Authors	Publication Year	Source Title	Total Citations	Average per Year
Lumpkin, GT; Dess, GG	1996	Academy of Management Review	3000	125.00
Chen, CC; Greene, PG; Crick, A	1998	Journal of Business Venturing	886	44.30
Zahra, SA; Covin, JG	1995	Journal of Business Venturing	750	31.25
Antoncic, B; Hisrich, RD	2001	Journal of Business Venturing	401	23.59
Palich, LE; Bagby, DR	1995	Journal of Business Venturing	358	15.57
Hornsby, JS; Kuratko, DF; Zahra, SA	2002	Journal of Business Venturing	331	20.69
Zahra, SA; Garvis, DM	2000	Journal of Business Venturing	327	18.17
Shrader, RC; Oviatt, BM; McDougall, PP	2000	Academy of Management Journal	305	16.94
Lyon, DW; Lumpkin, GT; Dess, GD	2000	Journal of Management	298	17.53
Mishina, Y; Pollock, TG; Porac, JF	2004	Strategic Management Journal	259	17.27

Source: Clarivate Analytics (2020), Web of Science: "Create Citation Report".

The paper of the authors Shrader, Oviatt, & McDougall (2000) highlighted in the table is one of three papers indexed by Clarivate as both article and proceedings papers. This paper is ranked as the eighth most cited paper, with an amount of 305 citations and is published by a journal that is not in the top of journals with articles on the subject (Academy of Management Journal). The Strategic Management Journal, which recorded a total of 8 published articles and was ranked 6th in Table 2, is also present in Table 3 due to the paper written by the authors Mishina, Pollock and Porac (2004) with 259 citations, an average of 17.27 citations/year.

3.3 Keywords Analysis

In order to analyse the keywords that were most frequently used, the 10 papers with the highest number of citations were used (table 4).

Tab. 4 Keywords most commonly used in the top 10 papers

Keywords	Sum Of Finds	Keywords	Sum Of Finds
STRATEGY/STRATEGIC	9	RISK	4
PERFORMANCE	7	ENVIRONMENT	4
FIRM/FIRMS	7	INOVATION	3
MANAGEMENT	6	ORGANIZATION	3
ENTREPRENEURSHIP	6	GROWTH	3
VENTURE	5	MARKET	2
BUSINESS	4	COMPETITIVE ADVANTAGE	2

Source: Clarivate Analytics, Web of Science (2020).

Table no. 4 shows that the authors have associated in their papers keywords such as firm/firm, business and organization when referring to a company; for performance, they also associated keywords such as venture, growth and competitive advantage; and regarding risk, it was correlated with market, innovation and environment.

Conclusions

This study aimed to address the extent to which the relationship between risk management and business performance in entrepreneurship is reflected in the literature. The paper presents quantitatively the level of written publications from 1993-2019 and analyses the 339 publications based on the number of citations, the year of publication, the type of papers, the journals in which they were published, the nationality of the authors, but also of the research field concerned. This analysis revealed the importance of effective risk management in the sustainable development of the companies that achieve the expected financial performance.

An in-depth analysis based on the 10 most cited works highlighted that the notion of performance is associated with the reduction of expenses, the increase of income and by gaining a competitive advantage. Entrepreneurs, but also scientific researchers, associate the risks with the uncertainty offered by innovation, the environment climate, but also with the market.

Regarding the areas in which the financial performance can be recorded on the basis of efficient risk management, most papers have been published in the fields: management, business and economics. The period in which most specialized studies have been carried out is 2015-2019.

Interest in improving performance has led researchers to deepen the methodology of cost reduction based on SWOT and Porter analyses, but also on risk matrices.

Analysing the sources of publication of the papers, the most frequent papers were found in a top journal, Journal of Business Venturing, which published six papers appreciated

worldwide and cited in accordance with the importance of the research carried out. The correlation between the performances and the risk management has an interest dating back to the 1990s and after the results of the bibliometric analysis carried out, the trend shows a continuity of this interest.

Regarding the limitations of the research, it should be noted that this analysis focused only on the information provided by a single database, with the possibility of excluding important papers related to the analysed subject.

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INTERNATIONALIZATION BEHAVIOR OF PARAGUAYAN SMALL AND MEDIUM-SIZED ENTERPRISES

Isha Ibrahim – Michael Neubert – Augustinus van der Krogt

Abstract

Purpose: This study aims to examine the manner in which small and medium-sized enterprises (SME) in Paraguay choose to internationalize, by dissecting their internationalization process and comparing the process to the framework described in the Uppsala internationalization process model (UIPM). The research follows a comparative multiple case-study approach, analyzing the internationalization of 62 Paraguayan companies. The chronology and the reasoning behind internationalization decisions are researched and compared to the UIPM to determine whether Paraguayan SMEs internationalize according to the UIPM.

Design/methodology/approach: The research follows a multiple case-study design, based on interviews with 62 entrepreneurs and senior managers, and data collected from their Paraguayan SMEs about their internationalization behavior using a purposive sampling method. Data analysis happened to dissect the similarities and differences so as to create patterns and themes based on the UIPM.

Findings: The suggested results can be summed up in three themes. (1) Paraguayan SMEs are using market research based, active market entry strategies. (2) Paraguayan SMEs develop new foreign markets according to the establishment chain of the Uppsala internationalization process model. (3) Paraguayan SMEs prefer export and hierarchical market entry forms. The generalizability of the results is limited to the SMEs due to the research methodology.

Research/practical implications: The suggested results of this multiple case study have implications for theory and practice. Paraguayan SMEs could use the findings to optimize their own internationalization strategies, Paraguayan politicians and export promotion agencies to design more efficient trade policies, and researchers could test the findings with quantitative methods or an analysis of unsuccessful market entries.

Originality/value: This paper adds new evidence about the internationalization behavior of SMEs in emerging economies and the UIPM.

Keywords: international business, Latin America, small- and medium-sized enterprises, market entry strategy, export

JEL Codes: M16, O54, Q17

Introduction

The Paraguayan economy is greatly dependent on the exports of agricultural products. As a relatively small country in the region of South America, Paraguay is identified as an emerging as well as a small and open economy (SMOPEC) and faces many challenges in competing with other countries in the region (Neubert, 2018). This creates the need for Paraguayan SMEs to understand the general internationalization models followed by emerging market firms (EMF) (Deng, Delios, & Peng, 2020) globally, to adopt the methods most profitable and applicable in the economic, geographical, administrative, and cultural background that is so unique to Paraguay (Neubert & van der Krogt, 2017; 2018).

The most commonly produced and traded Paraguayan items include soybeans, mate tea products, and meat products. Paraguayan SMEs are also dependent on exports in a wide array of industries including but not limited to the beverage, pharmaceutical, software, textile and chemical industries (Banco Central del Paraguay, 2019; Trade map, 2019). Being an incredibly rich area in agriculture, Paraguay, much like its neighboring countries, often has surplus production, which necessitates trading outside of the country as well, to maintain competitive pricing levels between firms operating within the country (Neubert, 2018).

Paraguay is a part of the MERCOSUR (2018) free trade agreement, which allows ease in export to neighboring member countries. The biggest export clients of the Paraguayan economy are Argentina and Brazil, followed closely by Chile and Bolivia. Most exports outside the MERCOSUR area of trade occur with Russia and USA (Banco Central del Paraguay, 2019). The economy of Paraguay though largely dependent on exports, is made up of many small companies, often family owned. As such, the purpose of this study is to dissect the internationalization patterns and the decisions that support these patterns.

This paper is based around the core research by Vahlne and Johanson (2017, 2020), Vahlne and Bhatti (2019), along with research on Paraguayan SMEs and their internationalization process conducted in 2018 by Neubert, which calls for further research, suggesting a larger scale of case study firms to be analyzed still in a qualitative measure in future research relating to the topic.

This paper is structured as follows: After the introduction, the literature will be reviewed and the conceptual framework introduced. The third chapter covers the research methodology including research questions, sampling strategy, data collection, and analysis followed by the presentation of the findings in the fourth chapter. The conclusions show the main findings, the limitations and implications, as well as calls for further research.

1. Literature Review and Conceptual Framework

The research by Vahlne and Johanson during the 1970's brought about one of the most widely used models for assessing how companies should integrate their resources into a market (Johanson & Vahlne, 2017; Hollensen, 2020). In contrast to the born global model (Neubert, 2018), the UIPM theorizes that firms follow a pattern of internationalization by starting the process in countries that are geographically closer and culturally more similar, before penetrating markets that are more distant. The SMEs analyzed showed that there was a pattern of internationalizing into new markets. These often started the integration via sporadic exporting to foreign markets, followed by regular export, an establishment of a foreign sales subsidiary, and finally foreign manufacturing (Fig. 1).

Fig. 1: Market distance and market commitment establishment chain

Market Entry Modes / Market Selection and Distance	Export	FDI Foreign Direct Investment	
	Direct Export (with Distributor)	Sales Office	WOS Wholly-owned Subsidiary with local Production
Mercosur Member States		Market Commitment Establishment Chain →	
Other Foreign Markets in Latin America			
Other Foreign Markets with Spanish-speaking Communities			
Other Foreign Markets	Market Distance Establishment Chain ↓		

Source: Neubert, 2018.

It is important to understand the key factors in making a successful market penetration, starts with knowledge about the foreign country and also having specific knowledge of the foreign market. For the Paraguayan firms being analyzed, it is clear that there is a need for the understanding of the differences in geography, between home based and foreign markets. This allows the firms to then understand their competitive advantage and the liability of foreignness. As such, increasing the knowledge of the foreign markets helps increase the market commitment (Hollensen, 2020). The level of market commitment is determined by assessing the market attractiveness, which is defined as a comparison of countries based on geographical, cultural, linguistic, and administrative differences. The lower these differences are between the new market and the home base, the higher the market attractiveness due to the ease of doing business (Neubert, 2018).

As seen in research by Neubert (2018), many Paraguayan companies venture first into markets with geographic, cultural, economic, and administrative similarities to them. Typically, these are the bordering countries with which free trade agreements have been established. In Paraguay, this is the Mercosur agreement and the countries mostly exported to are Brazil and Argentina, followed by Uruguay, Chile and Bolivia. Further trades are also seen in high numbers with countries that share similar language or culture such as the USA and Spain (Trade map, 2019). SME's regardless of the industry, are expected to follow internationalization behaviors that are low risk, mostly export based behavior in partnership with local companies who act as distributors (Neubert & Van Der Krogt, 2017).

As illustrated in Neubert's research (2018), active market entry strategies are market entries based on prior research, opportunity and experience (Fig. 2).

Fig. 2: Active market entry strategies

Source: Neubert (2018).

Paraguayan SME's are often family owned, which results in word of mouth and personal connections playing a major role in the internationalization patterns. This suggests that there is often a lack of knowledge of the markets being entered, although personal connection as a market entry incentive does point to reduced liability of foreignness (Clark, Li, & Shepherd, 2018). Further, Paraguayan companies have the benefit of market entry based on opportunity and experience, namely due to the fact that many of these SME's export agricultural and bovine products (Banco central del Paraguay, 2019). Often, they export to countries that are much further and outside of their free trade area (Mercosur, 2019; Trade map, 2019), Paraguay has an unprecedented advantage due to the quality and quantity of products available for export.

The newer developments of the UIPM emphasizes on the importance of these firm specific advantages in the context of active market entries (Vahlne & Bhatti, 2018). As such, this study aims to build on these theories to understand how the UIPM applies to SMEs in an emerging SMOPEC such as Paraguay, and how the outliers to these internationalization

behaviors justify their patterns. For this purpose, the methodology and discussion section of this paper will reference active market entry strategies (Neubert & van der Krogt, 2020) (Fig. 2), as well as the market establishment and commitment chains (Neubert, 2018) (Fig. 1).

2.   Research Methodology

This study utilizes a multiple case study research methodology to compare the internationalization behavior of Paraguayan SME's (Yin, 2018). The choice of method was based on the purpose of this study to explore the perceptions, opinions, and views of the entrepreneurs and senior managers of Paraguayan SMEs about the internationalization behavior of their firms. The purpose of this study and the choice of the research methodology lead to the following research question:

What are the perceptions of Paraguayan entrepreneurs and senior managers about the internationalization behavior of their Paraguayan SMEs?

The qualitative nature of the multiple case study research methodology allows for an in-depth analysis of the questions given the complex background of each of the subjects (Yin, 2018). For the purpose of this study, 62 Paraguayan SMEs were analyzed using a purposive sampling method. The case study firms are all SMEs domiciled in Paraguay and active in international business. 28 of the 62 (45%) companies analyzed were in the agriculture or meat industry. Mate tea and red meats are two of the biggest exports of Paraguay (Banco Central del Paraguay, 2019). A major reason for this is due to the demand for the high quality of the Paraguayan products, which suggest firm specific advantages (Vahlne & Bhatti, 2018). The remaining 55% of the companies belonged to food processing, metal, electric, chemical, pharmaceutical and textile, plastic and technology industries. The subject-matter experts are owners and senior managers of these case study firms, which are responsible for the internationalization activities and have at least five years of management and international business experience, and an undergraduate degree, and live in Paraguay.

Data collection was carried out by multiple sources of evidence. Besides semi-structured, in-depth, online interviews with senior managers and owners about the internationalization behavior of their case study firms, corporate documents about the internationalization activities were used to collect data. The data was collected in June and July 2019.

The data analysis was then based on finding logical similarities and differences derived from the data gathered through the interviews and from all 62 firms analyzed (Yin, 2018) using NVivo 12 Mac to store, to analyze, and to dissect the similarities and differences so as to create patterns and themes based on the UIPM.

3.   Findings

The data analysis revealed the following three themes to answer the research question about the perceptions of Paraguayan entrepreneurs and senior managers about the internationalization behavior of their Paraguayan SMEs. Due to the high number of 62 interviews with subject matter experts, this chapter will present a selection and summary of their most important statements.

Theme 1: Paraguayan SMEs are using a market research based, active market entry strategies

One subject matter expert stated the existential importance of exports for SMOPECs: "Paraguay has a small internal market. Without exports, we wouldn't survive." Foreign market development opportunities are actively sought. Many subject matter experts informed us that they visit national and international trade fairs and congresses to get in touch with clients and distributors in their most attractive foreign target markets. According to one SME, "a powerful distributor is a key factor for a successful market entry". Market evaluation is especially important for Paraguayan SMEs operating in the food industry due to custom duties, import quotas, or import controls of food hygiene, safety, and health. Especially the later require a comprehensive preparation, a long-term planning, and a good understanding about their competitiveness abroad as several subject matter experts from the food industry emphasized. Especially, bovine meat exporters suffer from strong competition in Mercosur markets, motivating them to search for attractive market opportunities outside of Latin America. Others added that the market attractiveness must be high to get the investments back in. In dependence of the market knowledge, network, origin, and international experience of subject matter experts, even distant foreign markets in Asia or Europe might be the most attractive ones according to the subject matter experts from foreign origin (e.g., China and Germany). The signature of a free trade agreement between the European Union (EU) and Mercosur in 2019 motivated the majority of subject matter experts to learn about the possibility to enter EU markets.

The statements of the subject matter experts seem to confirm the findings of Neubert (2018) stating that Paraguayan SMEs are using market research based, active market entry strategies (Fig. 2) to assess the attractiveness of foreign markets. Cultural, administrative, economic, and geographical proximity to Mercosur markets increase the foreign market attractiveness. Unique market opportunities like sporadic exports (e.g., due to Russian / EU sanctions) are exploited carefully without investing additional resources or taking higher risks.

Theme 2: Paraguayan SMEs develop new foreign markets according to the establishment chain of the Uppsala internationalization process model (UIPM)

Paraguayan SMEs use a market distance establishment chain according to the establishment chain of the UIPM (Fig. 3). Many subject matter experts stated, "Brazil is our first export market" or "We have started to export first to Argentina and Brazil". "I can travel there quickly in case of problems," added one subject matter expert. "It is easier", added another one, meaning market entry barriers. After a successful market entry in neighboring Mercosur member states, other country markets in the Mercosur or Latin America (e.g., Chile) are developed, followed by other Spanish-speaking markets (Fig. 3). Many subject matter experts acknowledge that they are currently just exporting to Brazil and Argentina.

Not all Paraguayan SMEs developed new foreign markets according to the establishment chain of the UIPM. Exceptions are medium-sized firms from the food industry exporting directly to China, Russia, or the Middle East, software firms offering offshoring services to US firms, or firms having special market knowledge or networks in specific markets.

This suggest that the UIPM as shown in Fig. 1 is applicable to the market entry sequence of the majority of the Paraguayan companies confirming the findings of Neubert (2018), where a market distance establishment chain can be observed as follows: Mercosur partners sharing borders, Mercosur countries not sharing borders, other South American countries, Spanish speaking countries in the Americas, other foreign markets (Fig. 3). The findings couldn't reveal any supporting evidence that young firms from emerging markets internationalize faster (Kumar, Singh, Purkayastha, Popli, & Gaur, 2019) or that the internationalization of SMEs from emerging markets is bound by multifaceted contextual influences (Deng et al., 2020).

Fig. 3: Market Distance Establishment Chain
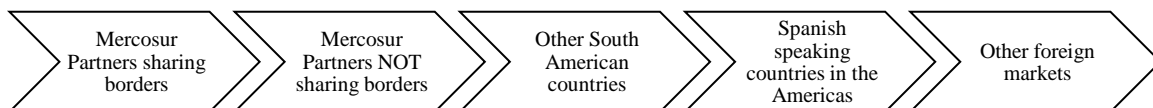
Source: Author.

Theme 3: Paraguayan SMEs prefer export and hierarchical market entry forms instead of intermediary forms

Of the 62 firms analyzed, only 16 firms (25.8%) had sales and distribution centers in foreign markets. 8 of these 16 firms had production or processing plants already set up in foreign markets. Thus, almost three quarters of Paraguayan SMEs use the market entry form "export". It is important to note, however, that nearly 90% of the companies that had factories in foreign markets chose to have factories in markets that were closest to Paraguay. In the case of the one company that had a factory and sales center in Europe, it was reasoned that this was ideal due to the quality of the product available in Europe. According to the statements of the subject matter experts, no case study firm of this sample uses an intermediary market entry form like e.g., joint ventures, intellectual property licensing, strategic alliances, or contract manufacturing. "We collaborate with distributors to acquire new clients quickly" stated one subject matter expert. Thus, Paraguayan SMEs are looking for distributors in their target markets to compensate for the liability of outsidership and foreignness (Vahlne & Johansen, 2017; Neubert, 2018). If the collaboration is successful, Paraguayan SMEs often hesitate to replace the distributor with their own distribution center. "If we trust our distributors and if they are successful, why should we replace them with our own sales people?" asks one subject matter expert similar as others. Some statements show that trust and a good personal relationship seem to be important for Paraguayan entrepreneurs and senior managers to make business. Another factor, which was mentioned, is the conservative investment philosophy especially in foreign markets. The industry in which the Paraguayan SMEs operate might be another reason to focus on export. Agricultural firms only produce in Paraguay and export their products. Subject matter experts from this industry often prefer to serve more markets with distributors than less markets with their own distribution centers to maximize business opportunities.

Paraguayan SMEs prefer export and hierarchical market entry forms instead of intermediary forms. Most of them only use the first step of the market commitment establishment chain: export. Market commitment chain establishment is also important, but it is apparent that there are cases in which it is not feasible to establish production plants or distribution centers in new markets. This is especially true in the case of SMEs in Paraguay that often only supply raw materials or semi-finished products. Thus, Paraguayan SMEs mainly use the first step of the market commitment establishment chain (export market entry forms) and prefer to develop another new market instead of dedicating additional resources to existing foreign markets (Neubert, 2018).

Conclusion

This study suggests additional as well as new evidence to existing studies, emphasizing the importance of three main determinants of success in new markets for SME's originating in SMOPECS (Neubert, 2017). Paraguay being a country heavily dependent on its exports via a multitude of SMEs, faces the need to understand the pattern that is most likely to succeed. Often, companies make the complex and expensive decision to internationalize, but without the proper tools to make the decision, these companies might be forced to withdraw from the new market. In line with the theories presented in Figure 1 and 2, the suggested findings of this study can be summed up in three parts.

(1) Paraguayan SMEs are using a market research based, active market entry strategies: The findings of this multiple-case study survey offer some interesting insights in the internationalisation behaviour of Paraguayan SMEs. It seems that Paraguayan are using market research based, active market entry strategies to get a good understanding about the attractiveness of their target markets before preparing a market entry. This theme confirms the findings of Neubert (2018) and Neubert and Van der Krogt (2017, 2018).

(2) Paraguayan SMEs develop new foreign markets according to the establishment chain of the Uppsala internationalization process model (UIPM): The study supports previous research in suggesting there is a pattern of market entry, which encourages a step-by-step market distance establishment chain (Neubert, 2018). Preference is shown for countries with low cultural, geographical, administrative and economical differences.

(3) Paraguayan SMEs prefer export and hierarchical market entry forms instead of intermediary forms: Market commitment chain establishment is also important, but it is apparent that there are cases in which it is not feasible to establish production plants or distribution centers in new markets. This is especially true in the case of SMEs in Paraguay that often only supply raw materials or semi-finished products. Thus, Paraguayan SMEs mainly use the first step of the market commitment establishment chain (export market entry forms) (Neubert, 2018).

The suggested results of this multiple case study have implications for theory and practice. Paraguayan SMEs could use the findings to optimize their own internationalization strategies, Paraguayan politicians and export promotion agencies to design more efficient trade policies. The suggested results offer researchers additional evidence about the internationalization behavior of SMEs in emerging economies and the UIPM.

While the study builds on previous research to bring forward unbiased results, it is limited by the research methodology and by the lack of information available to decide a second facet of internationalization – the reasons SMEs in Paraguay fail in their internationalization processes. While many companies succeed, it would be useful to analyze the reasons for failures, thus helping researchers understand better if failure is due to lack of implementation of theories or external factors. These external factors can then be studied and introduced into the further development of the UIPM to observe how they interact with existing factors. Finally, we call for further research to confirm the results of this multiple case study using a quantitative research methodology.

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TOWARDS THE CREATION OF SMART POLICY MIX FOR DEVELOPING TECHNOLOGY ENTREPRENEURSHIP ECOSYSTEM

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Abstract

Purpose: The purpose of the research is to test the feasibility of the Integrated Technology Forecasting Model (ITFM) as an approach to governments' smart policy mix decision making support. The research follows on the results of a three-year research project at the University of Belgrade, initiated by the Ministry of Innovation and Technology Development of Serbia, with the framework pilot test being identified as a research framework step. The pilot test was conducted for the Innovation and Entrepreneurship Ecosystem of Serbia, while the proposed framework is designed to have broader applicability for different ecosystems as well.

Design/methodology/approach: This paper is built upon an original research framework – the ITFM, integrating Delphi method, Objectives Matrix and Analytical Hierarchy Process. The feasibility of the framework is tested on a panel of experts from government, academia, and industry of Serbia that evaluated policy goals and measures through the developed questionnaire. The results were aggregated to calculate priorities of policy measures.

Findings: The pilot test conducted on a small sample, but encompassing relevant experts, provided valuable feedback on the feasibility of the proposed framework. The results fulfilled the main objectives of the pilot test: a consensus was reached among the panel experts and the prioritization of policy measures is presented. Suggestions by the panel pointed to the need for engaging panel experts in designing the questionnaire.

Originality/value: The presented research shows the potential for wider applicability of the novel methodological approach as a support to governments in prioritising policy goals and measures. The presented research framework, methodology and pilot test results are an original contribution of the authors. The paper's main value is in showing the results of a significant phase of the overall research project aimed at proposing a novel, creative approach to more responsible and effective development of policy decision-making.

Keywords: smart policy mix, innovation and entrepreneurship ecosystem (IEE), technology entrepreneurship

JEL Codes: O32, O38, L26A

Introduction

Competitive Innovation and Entrepreneurship Ecosystem (IEE), which comprises innovation and entrepreneurship chains and activities (Isenberg, 2011; Hao et al., 2017), is recognized as the crucial force boosting development of a country. Technology development and technology driven entrepreneurship are having a decisive role in this process. Beckman et al. (2012) define technology entrepreneurship as the crossing point of technological innovation and entrepreneurship and Etlie (2000) in his work emphasized that it is a link between technology and science that creates new value and contributes to the overall welfare of the economy and society. Governments are thus oriented at developing data and evidence based management of IEE through the smart policy mix. It refers to the balance of and interactions among policies (OECD, 2016) aimed at enhancing concrete IEE competitive performance. Technology forecasting methods are viewed as valuable tools for prioritizing the policy mix (Paliokaite et al., 2015). Policymakers are relying more on a systems-based support in developing more focused and effective policy measures and instruments that will bring effects in a short time span (European Commission, 2010; Dvouelty et al., 2020). Still, there stands a question of how to prioritize the policy mix which successfully reflects the priorities of the concrete IEE. This paper is built upon the previously developed Competitive IEE Framework (Levi-Jakšić et al., 2018a) which indicates the steps for creating Smart Innovation Policy. Global indices methodologies are used as the relevant reference base for IEE monitoring, while the suggested model adds the smart policy mix considerations for creating and enhancing competitive IEE.

This paper focuses on the implementation of the Integrated Technology Forecasting Model (ITFM) proposed by Levi-Jakšić et al. (2018b) for the creation of smart policy mix. The relevance of the subject is found in the rising necessity to provide support for effective and smart government interventions, on the one hand, and the lack of methodological support, on the other. It is noted that the greatest challenge of a successful policy mix is to reflect the priorities of the concrete IEE (OECD, 2016). This represents the main advantage of deploying the proposed model to set priorities for concrete IEE.

The presented research is a pilot testing of the third phase of the ITFM approach. The main goal is to test the feasibility of the model, more specifically covering two goals: 1) Providing feedback on the relevant policy measures and instruments, examining whether the panelists understood them in the right way and to receive feedback from panelists for suggestions concerning questionnaire; 2) Obtaining response in one round from a small sample

of experts from university, industry and government and explore if a consensus is reached as measured by dispersion rate.

The paper is structured in the following manner: Introduction provides current understanding of the problem through literature review; Section 1 gives a description of the research framework and methodology, with emphasis on criteria and policy measures used for the evaluation in the pilot research; Section 2 discusses the results of the pilot research and priorities for policy implementation; Finally, Section 3 gives the conclusions and future research directions.

1. Research Framework and Methodology

Numerous institutions, experts, and teams have been engaged in developing methodologies, models and tools for measuring and monitoring innovation and entrepreneurship environments (Acs et al., 2014; GII, 2019; GEDI, 2018, Hao et al., 2017). However, policymakers still struggle to prioritize measures for improvement and creation of competitive IEE.

The research conducted in this paper is based on the 3-phase framework for competitive IEE given by Levi-Jakšić et al. (2018a) for the smart policy creation process. The paper suggests that a competitive IEE can be achieved by following these steps: 1) Developing the IEE Main Domains Model; 2) Creating Integrated Model of Relations between IEE Domains and Policy instruments; and 3) Creating Smart Policy Framework based on a country specific IEE.

In this paper, we present the results of the feasibility pilot testing phase of the ITFM project based on a new methodological approach designed as support to identifying a smart policy mix to be deployed by the government in the given ecosystem circumstances. The research was initiated in 2018 and triggered by the absence of consistent methodological support to governments` policy decision making process related to improving the IEE. Previous research steps that are conducted are: 1) Creation of the ITFM for developing smart innovation and entrepreneurship policy (Levi-Jakšić et al., 2018a); 2) Selection of a set of policy measures and goals that are be achieved (Levi-Jakšić et al., 2019); and 3) Selection of criteria for prioritization of the proposed policy measures (Levi-Jakšić et al., 2018b).

The created ITFM model and approach is related to the approach of the EU Smart Specialisation Strategy developed by the European Commission Joint Research Center (EC JRC) recommending a "bottom-up approach", involving a broad set of stakeholders in a national economy/region/industry. The approach is defined as the Entrepreneurship Discovery Process, defined as "an inclusive and interactive bottom-up process in which participants from different environments (policy, business, academia, etc.) are discovering and

producing information about potential new activities, identifying potential opportunities that emerge through this interaction, while policymakers assess outcomes and ways to facilitate the realisation of this potential." (European Commission, 2018). ITFM integrates a broad panel of experts, theoreticians and practitioners, coming from different sectors in the economy and society, to build synergy and provide support to government efforts in deploying smart policy mix. In this way it overcomes the limited knowledge and insight capacities in circumstances when one principal agent (i.e. government) lacks "the robust and panoramic knowledge needed for this leading role" (European Commission, 2018).

In the study performed for 35 implementation cases of Smart Specialisation approach in the European regions and member states it is reported that "main challenges that policy-makers are seeking to address relating to the implementation of Smart Specialisation…are presented by order of prevalence: 1) the involvement of stakeholders in a continuous dialogue to drive the territorial innovation process; 2) the development of efficient innovation policy instruments to support the structural transformation of the economy at regional and/or national level; 3) the pursuit of the internationalization of the regional/national economy as well as the positioning in European value chains." (Cohen, 2019, pp. 8). Following such an approach, we developed the ITFM which is based on integrating technology forecasting methods in creating priorities as a decision support tool for governments in developing a smart policy mix comprising financial direct, financial indirect (fiscal), legal and non-financial measures and instruments.

The main strength of the technological forecasting methods for providing methodological support to policy decision making are: a) their main concept of a "bottom-up" approach, in using the knowledge, experience and intuition of a wide range of experts from different domains in a systematic way, and b) their dual character as being both qualitative and quantitative. The ITFM has been developed to integrate and adapt the acclaimed methods of technological forecasting: Delphi method, Analytic Hierarchical Process (AHP), Delphi-AHP, and the modified Objectives Matrix (Levi-Jakšić et al., 2018b).

Fig. 1: Research Framework
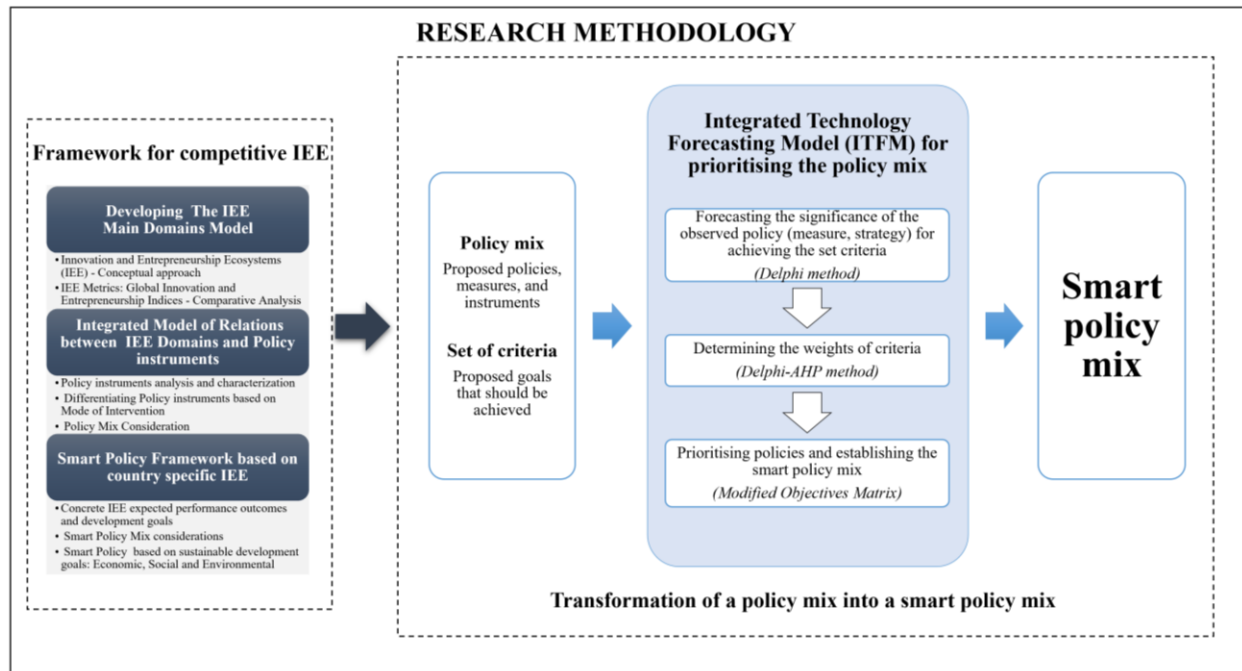
Source: Authors' elaboration of the frameworks and models given in Levi-Jakšić et al. (2018a, pp. 663), Levi-Jakšić et al. (2018b, pp. 2), and Levi-Jakšić et al. (2019, pp. 211).

The pilot testing of the feasibility of the model is in this phase performed for the Serbian IEE, involving experts from the Triple Helix domains: government, university and industry (Etzkowitz & Leydesdorff, 1995), to assess goals and instruments for the Serbian IEE based on their knowledge, experience, intuition. The pilot testing was aimed at testing the feasibility of the ITFM before the next steps would be applied leading to the government accepting the ITFM approach and model as continuous methodological support. Before the application of the proposed model, it was necessary to understand IEE in the Republic of Serbia and define and select proper set of measures and policies that will be evaluated, as well as the criteria for achieving competitive IEE. The details on the Serbian IEE, criteria and proposed policies and measures are given in the next section.

1.1   Situation in Serbia

According to the Global Innovation Index (GII) Report 2019, Serbia's innovation performance is in line with the expectations for its level of development as an upper-middle income country (GII, 2019, p. xxii). Serbia's GII score for 2019 is 35.71 which is slightly above the median value of 33.86, and is ranked 57th out of 129 countries, and 34th in the European region. Serbia scores 44.5 (rank 64) for the innovation input which is almost in line with the median value of 43.46, while for the innovation output Serbia scores 26.93 (rank 57) which is above the median value of 23.54. The Government of Serbia is placing high priority in developing the IEE of

Serbia (MESTD, 2015). In practice, multiple actions have been undertaken by the Government of Serbia in the past decade towards achieving this goal, e.g. founding of Innovation Fund, establishing of a new government sector - new Ministry for Innovation and Technological development, deployment of a set of policy measures to support IEE in Serbia, seen as subsidies, support to women entrepreneurship, founding of science parks (Beograd, Novi Sad), establishing Innovation and Technology Transfer Centers and many other. Currently, Serbia has 63 scientific institutes, 121 higher education institutions and 20 centers of excellence. It has 7 innovation centers, 19 R&D centers, 43 development and production centers and 11 support organizations (science-technology parks and business-technology incubators). Serbia's ICT services export constantly rises and is by far largest net export branch, being at the level of 17.1% of total services exports in 2017 (WorldBank, 2019a) and on the level of over 1 billion USD (WorldBank, 2019b).

Although the Government of Serbia has deployed a set of different measures: financial, fiscal, legal and non-financial, aimed at improving the overall ambiance for innovation and entrepreneurship in Serbia, it reports lack of methodological support in the policy decision making processes. In the circumstances of limited budget and low investments in R&D, the necessity to establish a smart policy mix becomes even more clear and urgent. The concrete situation of Serbia as related to the policy measures taken by the government in developing the IEE, can be characterized as follows: 1) there lacks a more systematized approach to establishing effective policy mix of measures and instruments adapted to the needs of the IEE. Decisions are often made without adequate methodological support in identifying the priorities, crucial domains and best attuned measures for improvements of the critical domains; 2) there lacks continuous monitoring of the impact of the measures taken by the government, and of IEE performance. This is reported to be a point of concern for governments in other countries as well, as can be found in the OECD and EU reports, clearly emphasized in the Report of the EC JRC that the governments "…do not have innate wisdom or the ex-ante knowledge about future priorities. Policy makers must guard against the intellectual logic imposed by the principal-agent model, according to which the principal, that is, the government, knows from the start which specialisations domains should be developed" (European Commission, 2018).

1.2 Identification of Criteria

To conduct a research and prioritize policy measures, it was necessary to select relevant criteria that will be used during Delphi procedure. Criteria were set based on the research and analysis of Levi-Jakšić et al. (2018b) and defined based on the: 1) state of the entrepreneurial

environment in the Republic of Serbia and the needs of its improvement based on the country's performance obtained from official reports (European Innovation Scoreboard (EIS), GII, Global Competitiveness Index (GCI), Doing Business, strategies published by the Government, Statistical Office Yearbooks); 2) the relevant domains of global innovation and entrepreneurship indices (EIS, GII, Doing Business, GCI, Babson Entrepreneurship Ecosystem Project, and The OECD framework); 3) the frameworks set in the Smart Specialization Strategy; 4) the strategic goals and priorities of the Government of the Republic of Serbia.

Ten relevant criteria for the Serbian IEE development are set, representing an open list and subject to change. These criteria are used in the process of assessment and evaluation of the expected effects of different policies, strategies, and measures (in future text refers to as "policy measures") that can be used for developing the IEE. The criteria are given in the previous research by Levi-Jakšić et al. (2018b), and they are listed in the Table 1.

Tab. 1: Selected Policy Measures for developing competitive IEE

Relevant criteria for selection
1. Fulfilling Sustainable Development Goals (SDG);
2. Contribution to employability (EMP);
3. Contribution to improvement of the entrepreneurial climate in the risk-accepting society (CLIM);
4. Contribution to networking, cooperation, and partnership (NETW);
5. Contribution to the development of higher education of creative and entrepreneurial human capital (EDUC);
6. Contribution to development and application of the ICT (ICT);
7. Contribution to strengthening links between science and practice (SP);
8. Contribution to rapid growth and achievement of short-term results (GROW);
9. Compliance with the relevant EU documents (EUSTR);
10. Compliance with the relevant Government Strategies and Plans of the Republic of Serbia (SRBSTR).

Source: Levi-Jakšić et al. (2018b).

1.3   Identification of Policy Measures

The global indices enable ranking and comparisons between countries and regions and can be used as guidance for strategic governance with the aim to better focus strategic decisions concerning governments measures and instruments to intervene in relation to critical domains where the country's ecosystem performance lags behind other countries. In this paper, the global indices are used as the initial starting point for: 1) developing smart policy mix of measures and instruments for government intervention leading ultimately to the improvement of the IEE of a country (Levi-Jakšić et al., 2018a; 2019).

The GII has been chosen for future analysis after a thorough research where we reviewed six relevant ecosystem measurement approaches for comparative analysis: EIS, GII, Babson,

OECD - Entrepreneurship Measurement Framework, Doing Business and GCI (Levi-Jakšić et al., 2018a). GII has been reported to possess advantages well suited to our research aims in terms of its comprehensiveness covering a broad range of indicators.

In this paper the focus is on the Pillar 6 of the GII. The selected policy measures are presented in Table 2. The policy measures were selected from a broad list of measures related to the GII pillars and indicators, specifically related to Pillar 6: *Knowledge and Technology Outputs*. The selection is made based on the "time to effect" criterion, i.e. the expected "quick-win" measures were considered for further analysis. Policy measures and instruments are grouped according to different criteria: target groups, supply side, demand side, planned outcomes, effects and goals (Levi-Jakšić et al., 2018a). In this research we have chosen to group the policy measures and instruments for developing the IEE based on the type of intervention criteria as follows: direct financial, indirect financial (fiscal), legal, and non-financial measures.

The above listed four types of measures are further elaborated depending on the concrete intervention necessary to upgrade specific parameters of the real ecosystem presented by specific indicators within the global index/domain. The focus of the research is to tackle the Pillar 6 of GII: *Knowledge and Technology output* comprising 14 indicators and to conduct pilot testing for this pillar for the Serbian ecosystem. We developed a set of policy measures and instruments, grouped in four types listed above, based on the analysis of relevant literature, reports and experiences of different countries and agencies, and by using Brainstorming with government, academia and industry experts for the Serbian ecosystem. The list is presented in Table 2.

Tab. 2: Selected Policy Measures for developing competitive IEE

DIRECT FINACIAL MEASURES (Measures 1-6)
Subsidies for innovation entrepreneurship programmes with results indicated by the number of patent applications and approval.
Setting up Entrepreneurship Capital Funds
Favourable credit lines for stimulating high-tech exports, ICT and Intellectual Property
Funding of activities and awards for outstanding entrepreneurial results
Financial support for public-private projects, R&D projects and technological ventures in High-Tech (HT) and Medium High-Tech (MHT) sectors
Diverse forms of financing university accelerators and incubators, scientific parks and companies, with feedback on the effects and results achieved
INDIRECT FINANCIAL MEASURES (TAX POLICY MEASURES) (Measures 7-8)
Tax incentives for private sector investments into qualified R&D institutions
Tax incentives in the form of tax deduction or tax release in stimulating R&D and innovative technology entrepreneurship

LAW AND REGULATIONS (Measures 9-11)
Legal provision for organisational framework, forms and models for establishing innovation and technology transfer offices, centres, agencies
Redefining administrative obligations for start-ups
Developing legal framework for administering quicker and more efficient exports, partnerships, software usage
NON-FINANCIAL MEASURES (Measures 12-19)
Developing Digital Platforms in support of technology entrepreneurship
Developing the evaluation and monitoring system for registering the effect of policy measures
Creating the system for continuous monitoring, measuring and control of the policy measures effect and improvement of the IEE
Entrepreneurship education, training and promotion
Publishing brochures and other relevant material
Mediating and support activities for founding and fast growth of emerging innovative firms
Introducing and disseminating knowledge on the distinction and different firm forms and categories
Development of diverse forms of support to continuous IEE improvement

Source: Adapted from Levi-Jakšić et al. (2019).

On the Example of *New Business Density* indicator from the Pillar 6 of GII we show how the initial list of the policy measures is established in relation to the parameters of different indicators of Pillar 6 for Serbia.

1) Examination of the description of the indicator is given in GII (2019): "*Number of new firms defined as the number of firms registered in the year which is analysed in relation to one thousand population aged 15-64 years*".

2) Examination of the indicator value from the official GII report and comparison with relevant countries (i.e. Serbia was scoring the third lowest value in the region). Identification of the policy measures for each strategy group that can improve the New Business Density value with focus on Quick win strategies. For example: Financial direct: *Diverse forms of financing university accelerators and incubators, scientific parks and companies, with feedback on the effects and results achieved;* Non-financial: *Developing digital platforms in support of technology entrepreneurship;* Indirect financial: *Tax incentives in the form of tax deduction or tax release in stimulating R&D and innovative technology entrepreneurship*; Law and regulations: *Redefining administrative obligations for start-ups*.

2. Research results

To have a comprehensive view of the problem and various perspectives, it was necessary to collect responses from the relevant representatives of the IEE. For this purpose, we used the Triple Helix approach which suggests that economic and social development is derived from the interaction between University, Industry, and Government (Etzkowitz & Leydesdorff, 1995). In the pilot research, we collected responses to the defined questionnaire from the group of 12 experts – representatives of each relevant Triple Helix actor (Table 3).

Tab. 3: Structure of respondents

	Academia	Government	Industry	Total
Number of respondents	5	3	4	12

Source: Authors' elaboration of the experts' responses collected from the survey.

In the first phase, the experts were asked to provide their opinion on the significance of the criterion on a scale 1-9 and perform the pairwise comparison of the criteria, following the AHP. Then, it was necessary to perform the Phase 2 and conduct a Delphi-AHP method to aggregate the results and determine the relevance of the criteria. The values of the criteria relevance and their ranks are listed in Table 4. For each step of the research we calculated the standard deviation to examine the consensus among the experts. In each step of the research, the experts reached the consensus with a low level of standard deviation (below 1.2). The results listed in Table 4 indicate that, according to the panel, the most significant criterion for selecting the proper policy or measure is the fulfilment of sustainable development goals. The second criterion that has the most influence on the selection of the policy is if it affects the development of higher education of creative and entrepreneurial human capital, while the least important criteria are compliance with the relevant EU documents and relevant government strategies and plans of the Republic of Serbia. However, it should be noted, that the results are highly affected by the background of the respondents. Since the respondents from academia were the majority, it could be expected that the ranks of the criteria would differ with different structure of the experts. The results obtained, nevertheless, fulfill the pilot research objectives, indicating the feasibility of the ITFM as combination of methods to support smart policy mix creation enabling the next step which would include a wider list of experts for the panel.

Tab. 4: Values of criteria priority

Relevant criteria for selection	Value	Rank
Fulfilling Sustainable Development Goals (SDG)	0.1690	1
Contribution to employability (EMP)	0.1280	3
Contribution to improvement of the entrepreneurial climate in the risk-accepting society (CLIM)	0.0876	6
Contribution to networking, cooperation, and partnership (NETW)	0.0817	7
Contribution to development of higher educ. of creative and entrepreneurial human capital (EDUC)	0.1534	2
Contribution to development and application of the ICT (ICT)	0.1038	5
Contribution to strengthening links between science and practice (SP)	0.1188	4
Contribution to rapid growth and achievement of short-term results (GROW)	0.0644	8
Compliance with the relevant EU documents (EUSTR)	0.0494	9
Compliance with the relevant Government Strategies and Plans of the Republic of Serbia (SRBSTR)	0.0439	10

Source: Excel, authors' elaboration of the experts' responses collected from the survey.

Phase 3 of the research was aimed to prioritize the policies and measures according to the defined criteria and establish the smart policy mix. For this part of the research, we listed 19 policies and measures classified into four groups (Table 2). The priorities for the Selected list of Policy measures (Table 5) were determined by modified objectives matrix. Namely, each policy measure was assessed by experts on a scale from 1 to 5 for each criterion. Further, the average score for each policy for each criterion was multiplied with the criterion weight from Phase 2. The aggregated results on the priorities for all measures are given in Table 5. After the aggregation of the results, the highest priority was given to the measure that is related the *support of accelerators, business incubators, science and technology parks and technology transfer centers for establishing and operating young innovative businesses*. The second priority was given to the activities that enable *Continuous improvement of the innovation and entrepreneurial ecosystem (specialized agencies, regulatory bodies for consulting, systemic approach, regional cooperation and networks)*, while the third position was given to the measure *Financial support for the accelerators, university incubators, science parks and companies*. Three measures that are assessed as the least important for the smart policy mix are: *Publication of the brochures and other materials for SMEs with relevant instructions for protecting intellectual property*; *Allocation of the resources from governmental budget for awards, best patent competitions, etc.*; and *Tax incentives for private investors to invest in qualified R&D institutions*. The results of the pilot test confirm the feasibility of ITFM and indicate the need to proceeding to the next research step, i.e. the phase where a wider and well-balanced panel will be participating in at least three survey rounds for achieving the results with high consensus and consistency rates.

Tab. 5: Values of measures' priorities and ranks

Direct Financial Measures	Value	Rank
Measure 1	3.586	13
Measure 2	3.715	7
Measure 3	3.724	5
Measure 4	3.164	18
Measure 5	3.696	8
Measure 6	3.941	3
Indirect Financial Measures		
Measure 7	3.439	17
Measure 8	3.473	16
Laws and Legal Measures		
Measure 9	3.635	12
Measure 10	3.548	15
Measure 11	3.553	14
Nonfinancial Measures		
Measure 12	3.796	4
Measure 13	3.722	6
Measure 14	3.693	9
Measure 15	3.686	10
Measure 16	2.928	19
Measure 17	4.026	1
Measure 18	3.668	11
Measure 19	3.976	2

Source: Excel, authors' elaboration of the experts' responses collected from the survey.

Conclusion

In this paper the pilot testing of the feasibility of the ITFM is presented as a significant part of the overall Research Project based on a novel approach for creating smart policy mix using an original methodological approach as a combination of different technology management methods best suited for different phases of the project. In this paper, the main research focus was to verify the feasibility of the created model as support to creating a smart policy mix for concrete Innovation and Entrepreneurship Ecosystem (IEE). The results of the pilot research imply that: 1. the Questionnaire developed for survey purposes was comprehensive to the panel experts; 2. The panel gave suggestions to introduce an additional initial step in checking the Questionnaire by the chosen panel in order to improve its comprehensiveness and quality, prior to its execution in survey rounds; 3. After the first round of the survey, consensus has been reached among panel experts with less than 1.2 standard deviation for all the survey questions; 4. The results calculated enabled ranking and prioritizing policy measures with the note that

those are the results obtained from a limited number of panel experts and they are to be used only as ITFM feasibility testing results. Priorities were derived from the survey responses of 12 panel experts as representatives of the Triple Helix domains. The results indicate that the ITFM model and approach have the capacity to be more widely deployed in the process of setting the priorities of policy mix measures corresponding to concrete IEE characteristics. It is concluded that it has the potential to be implemented as a useful tool in supporting government policy mix plans and decisions based on forecasted priorities for government intervention in any country and in any IEE domain. Thus, although tested for the Serbian ecosystem, it has a more general applicability. To obtain more relevant results it is necessary to perform the survey among a larger panel of experts. The ultimate goal of the complete research project is its wider acceptance and deployment for providing continuous smart policy mix support for developing the IEE. By implementation in the ecosystem of Serbia, it is expected to lead to the improvement of the IEE and better ranking of Serbia on the global innovation and entrepreneurship indices' lists.

Further research encompasses final methodological verification steps and project diffusion activities for wider deployment are outlined drawing on the experience and conclusions arising from the pilot project phase as follows: 1) Define the panel structure based on the representative number of experts for each Triple Helix category; 2) Creating the final list of criteria (goals) and policy measures conducting a Delphi Survey prior to the main research execution, and involving the panel; 3) Complete the Questionnaire with a list of policy measures related to the relevant domains of Global Indices; 4) Develop software enabling Internet online survey; 5) Conduct the research via Internet and create software for different analysis purposes.

The above listed steps of future research, in our opinion, will lead to the diffusion of the ITFM approach and its wider deployment as a useful and valuable support tool for effective management based on smart and responsible decision making ultimately contributing competitive and sustainable IEE development. The full effects of the ITFM as support tool will be known after it has been used for smart policy mix creation and the concrete IEE improvements achieved and monitored.

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THE IMPACT OF INNOVATION FLEXIBILITY ON INNOVATION PERFORMANCE IN SMALL AND MEDIUM MANUFACTURING COMPANIES

Lucie Kaňovská - Eva Tomášková

Abstract

Purpose: Flexibility is important for firms to attain and sustain a competitive advantage. However, innovation is also a crucial aspect that not only manufacturers have to manage when planning their business strategies to build a competitive advantage. This present study investigates the problems of flexibility in manufacturing companies via different points of view among electrical engineering companies in the Czech Republic. The aim of this paper is to identify the impact of innovative flexibility on innovation performance by small and medium-sized manufacturing companies.

Methodology: To fulfill the research objective, a questionnaire in the form of the Likert scale was prepared to gather information. A total of 112 SMEs from the Czech Republic participated in the survey from July to October 2019. This is the first empirical research focused on this area held among electrical engineering companies in the Czech Republic.

Findings: Innovative flexibility is positively associated with innovation performance in small and medium manufacturing companies.

Research implications: Our study shows a great deal of interesting information related to flexibility in manufacturing companies. The findings of the research contribute to an understanding of the relationship between innovation flexibility and innovation performance. Results of the research show that there is a positive relationship between innovation flexibility in products and innovation performance and innovation flexibility in accompanying services and innovation flexibility as well.

Value: This research study provides insights into the complex relationship between innovation flexibility and innovation development. There is still little information concerning understanding of flexibility in manufacturing companies.

Keywords: innovation flexibility, innovation performance, electrical engineering companies, Czech Republic

JEL Codes: M31, L94, L25

Introduction

Innovation, a crucial aspect, needs to be taken into account when companies developing their strategies to build and sustain competitive advantage (Du Plessis, 2007). Service innovation can take businesses in different ways, such as focusing on new business markets, spreading service offering, improving flexibility and service quality, decreasing labor cost, innovating old services, decreasing environmental harm and reducing energy and used materials (Tether, 2003). Du Plessis (2007, pp. 22) defines innovation as "the creation of new knowledge and ideas to facilitate new business outcomes, aimed at improving internal business processes and structures and to create market-driven products and services; innovation encompasses both radical and incremental innovation". Innovation and flexibility are very important not only for tangible products, but also for services, which are included in the manufacturer's offer. These two aspects could also be a main competitive advantage in today's fierce markets. Tomášková and Kaňovská (2019) presented that there is no direct impact of flexibility and innovation in services on customers, thorough flexibility and innovation perceived by customers are still affecting.

The aim of this paper is to find out the impact of innovative flexibility on innovation performance by small and medium-sized manufacturing companies. This topic has not been studied a great deal in the Czech Republic, even though the industry is still very important here.

The novelty of this paper is that it shows the relationship between innovation flexibility and innovation performance, and this innovation flexibility is examined in the breakdown between products and accompanying services. Some authors focused on very related topic, i.e. innovation and its affects to knowledge management processes (Obeidat et al., 2016), service flexibility (Brozovic et al., 2016), performance measurement approach for innovation capability in SMEs (Saunila, 2016) or manufacturing flexibility and business performance (Wei et al., 2017), but no author solved it from the view of innovation flexibility and accompanying services. This paper has the following structure: Literature review, methodology, results, discussion and conclusion.

1. Literature Review

According to Simetinger (2019) the new approaches in management and leadership are openness to the innovation and changes, and overall higher flexibility. Beraha et al. (2018) notice that strategic flexibility configurations (production flexibility, marketing flexibility and HR inventory) have a significant role in product innovation. The issue regarding to the importance of small and medium companies in economic growth has been well described

(Kaminski et al., 2008). The competitive advantage of SMEs is found in developing knowledge specialization, which would help them to acquire greater innovation flexibility in dynamic business environments. Today, companies must look for ways to reduce uncertainty and recognize customer demand effectively. And this is precisely the case for SMEs that need to be able to respond quickly to customer requirements in order to be able to stay on the market at all (Liao and Barnes, 2015). Innovation is a key consideration that a company must continually consider when developing its business strategies that seek to build and maintain a competitive advantage (Du Plessis, 2007). Du Plessis (2007, pp. 22) marks innovation as "the creation of new knowledge and ideas to facilitate new business outcomes, aimed at improving internal business processes and structures and to create market-driven products and services; innovation encompasses both radical and incremental innovation".

Palacios et al. (2009) claim that innovation has the following three options: a) product / service innovation that seeks to provide a different, improved or new product / service on the market and can be done in the form of a significant or gradual innovation; b) process innovation, where a firm seeks to provide a better manufacturing or service process than the current one; (c) managerial innovation, which seeks to incorporate new managerial regulations, systems, procedures and methods to increase efficiency in management. It is possible to see that innovation has positive impact on business performance. These assumption were confirmed by Chattopadhyay and Shah (2014) or Hult et al. (2004).

Innovation flexibility relating to product is increasingly seen as a key element in creating a sustainable competitive advantage in more and more turbulent markets (Liao et al., 2010). It is perceived as flexibility oriented outside the company environment and towards customers where value can be achieved by customers. Innovation flexibility relating to product is defined as the ability of a company to adapt to the process of product innovation and the effective introduction of a new product that reflects changes in the business environment. It provides a number of appropriate methods of action, response and adaptation in a coherent business environment. Through flexibility in product innovation, companies can go after an innovative way that is possible to accept a stronger risk of design modifications, achieve better proposals to meet customer needs and technologies, and adapt to evolving design necessities, enabling all companies to better customize their products to active market conditions (Billington & Johnson, 2005).

Large companies have a better ability to allocate the resources needed to implement action to respond to plan changes. SMEs must seek to find a source of flexibility outside their company (Liao and Barnes, 2015). Carlsson (1989) also said that flexibility need not only be mentioned for SMEs. Rather, the flexibility of SMEs is based on their ability to handle the possibility of

using variable factors as their source of flexibility. SMEs are more likely to achieve flexibility through relationships and cooperation in the supply chain over large companies. So far, this research has not paid much attention, which may lead to very limited implementation opportunities for SMEs who would like to focus on the flexibility strategy in product innovation (Liao and Barnes, 2015).

This paper focuses on the issue of innovation flexibility in manufacturing companies, and in particular on the impact of innovation flexibility (related to product and to accompanying services) on innovation development. The following hypothesis were formulated to fulfill the objective of this article:

H1: Innovation flexibility is positively associated with innovation performance in small and medium manufacturing companies.

H2: Total innovation performance depends on innovation flexibility items.

2. Methodology

The quantitative research was prepared to more deeply understand the problems of flexibility in manufacturing companies from different views. The research is a follow-up to the previous research, which was attended by 60 manufacturing companies. The research used an online questionnaire and consisted of seven parts with suitable questions focusing on external (customers and suppliers) and internal cooperation flexibility, innovation flexibility (relating to both products and accompanying services), innovation development and performance development. The last part of the questionnaire asked for general information about the respondents, including a request about their interest in smart service provision. The items relating to flexibility were based on Tomášková (2005), Liao and Barnes (2015), Obeidat et al. (2016). The items relating to innovation performance were based on Liao and Barnes (2015) and Obeidat et al. (2016). Business performance items typically measure the use of marketing performance items (items 1-3) and financial performance items (items 4 & 5). The items relating to smart service provision were inspired by Grubic and Peppard (2016), Bjerke and Johansson (2015), Tomášková (2005) and Chaudhiri et al. (2018).

The questionnaire has a Likert scale form; the range of the Likert scale was from 1 (No, I don't agree) to 5 (Yes, I agree). All parts were tested by using Cronbach alpha.

The level of reliability for external cooperation flexibility for customers was 0.792, for external cooperation flexibility for suppliers 0.812, for internal cooperation flexibility 0.814, for innovation flexibility is 0.919 (the level or reliability is her, it shows that consistence of items is very good), for innovation flexibility relating to product 0.832, for innovation

flexibility relating to accompanying services 0.890, for innovation development 0.677 and for performance development 0.673. The levels of reliability were good for all parts of the questionnaire except innovation development and performance development where the level of reliability is questionable.

Respondents, directors or managers of SMEs from the Czech Republic which produce electric equipment and electronic components in the Czech Republic were contacted by email and asked to fill out a questionnaire, which was web-based. Incomplete questionnaires were discarded. The data was collected from July to October 2019. Manufacturers participating in the research comply with the Czech industry classification, namely CZ-NACE 26 (Manufacturer of computer, electronic and optical products) and CZ-NACE 27 (The Production of Electrical Equipment). There are 278 companies in CZ-NACE 26 and 575 companies in CZ-NACE 27 with 10 – 250 employees according to Czech Statistical Office. Totally there are 853 companies (data are from December 2019). Small and medium manufacturers were selected from the Amadeus database. Total number of SME in CZ-NACE 26 and CZ-NACE 27 was 730, but 22 emails were sent back. These companies have already ceased to exist or are in liquidation or contact emails were missing and the companies were no longer traceable. In total, 112 full-filled questionnaires were received back. The data analysis was done by the software package SPSS, Version 17. For the measurement of the correlation of two variables Spearman's rank-order correlation coefficient and multiple regression analysis were used.

To fulfill the aim of the paper to identify the impact of innovative flexibility on innovation performance by small and medium manufacturing companies only the items relating to innovation flexibility and the items of innovation performance were chosen from the questionnaire.

3. Results

The results from the research focused on innovation flexibility are presented in Tab. 1 below.

Tab. 1: Results from the research focused on innovation flexibility

Innovation performance	We can introduce a high number of new products into production each year.	We are one of the first to market with innovative new products.	We are perceived by our customers to be more innovative than our competitors.	We are able to develop new products with low-average cost.	New products are profitable.
Innovation flexibility in products					
We can quickly respond to changes in customer requirements and modify existing products.	.134 .160	.252** .007	.297** .001	.143 .134	.280** .003

The firm incorporates technologies into new products.	.204* .031	.261** .006	.379** .000	.320** .001	.208* .027
We have the ability to design an extensive variety of new products.	.154 .106	.154 .104	.125 .188	.086 .336	.329** .000
We are able to develop new products in a short time.	.354** .000	.311** .001	.169 .075	.212* .025	.328** .000
We introduce new products in a short time.	.375** .000	.362** .000	.281* .003	.294** .002	.326** .000
Innovation flexibility in accompanying services					
We can quickly respond to changes in customer requirements and modify existing services.	.120 .206	.313** .001	.180 .058	.143 .132	.120 .209
The firm incorporates technologies into new services.	.275** .003	.370** .000	.397** .000	.308** .001	.169 .075
We have the ability to design an extensive variety of new services.	.186* .050	.245** .009	.126 .184	.209* .027	.323** .001
We are able to develop new services in a short time.	.297** .001	.269** .004	.267** .004	.427** .000	.207* .029
We introduce new services in a short time.	.202* .033	.234* .013	.209* .027	.352** .000	.119 .211

The first value is Spearman's rank correlation: Spearman's rho, the second value is p-value. If **p < 0.05** then we reject the null hypothesis (H_0: items are independent), i.e. accept that the sample gives reasonable evidence to support the alternative hypothesis (H_A: items are dependent).

Source: Authors.

The findings presented in Table 1 show that three items, "The firm incorporates technologies into new products", "We introduce new products in a short time" and "We are able to develop new services in a short time" have a positive correlation with all five items in Table 1 (p < 0.05). Furthermore, the four items "We are able to develop new products in a short time", "The firm incorporates technologies", We have the ability to design an extensive variety of new services" and "We introduce new services in a short time" have a positive correlation with four items (out of five possible items) in Table 1 (p < 0.05).

From another point of view, innovation performance, one item, "We are one of the first to market with innovating new products", has a positive correlation with nine items (out of ten

possible items) in Table 1 ($p < 0.05$). There is no positive correlation only in one item, "We have the ability to design an extensive variety of new products".

In addition, multiple regression analysis was used, where the dependence of innovation performance is monitor on the components of innovation flexibility. First, all the items of innovative flexibility in the model were included. Table 2 below shows which items contribute to the explanation of innovation performance (Sig. <0.05) and which do not (Sig.> 0.05). Items that are meaningful in the model are marked in italics, i.e. they are statistically significant.

Tab. 2: The items contributing to explain innovation performance

Coefficients[a,b]	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
We can quickly respond to changes in customer requirements and modify existing products.	.054	.082	.066	.654	.514
The firm incorporates technologies into new products.	.125	.103	.142	1.209	.229
We have the ability to design an extensive variety of new products.	.254	.085	.259	2.980	*.004*
We are able to develop new products in a short time.	-.068	.110	-.071	-.613	.541
We introduce new products in a short time.	.303	.116	.307	2.611	*.010*
We can quickly respond to changes in customer requirements and modify existing services.	.217	.093	.256	2.346	*.021*
The firm incorporates technologies into new services.	.055	.137	.061	.399	.691
We have the ability to design an extensive variety of new services.	-.208	.109	-.199	-1.911	.059
We are able to develop new services in a short time.	.726	.205	.715	3.544	*.001*
We introduce new services in a short time.	-.547	.201	-.539	-2.722	*.008*

a. Dependent Variable: Innovation Performance.
b. Linear Regression through the Origin.
Source: Authors.

The insignificance of most items is due to the high correlation between items. Correlating items from the model are excluded. Only significant items are included in the next model. In Table 3, it can be seen that all included items in the model are statistically significant (Sig. <0.05).

Tab. 3: Statistically significant items of the model

Coefficients[a,b]	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
We have the ability to design an extensive variety of new products.	.157	.065	.160	2.428	.017
We are able to develop new products in a short time.	.350	.087	.355	4.039	.000
We can quickly respond to changes in customer requirements and modify existing services.	.294	.075	.346	3.930	.000
We are able to develop new services in a short time.	.642	.192	.633	3.353	.001
We introduce new services in a short time.	-.508	.199	-.501	-2.549	.012

a. Dependent Variable: Innovation Performance.
b. Linear Regression through the Origin.
Source: Authors.

The overall F-test of the model confirms the suitability of the model (Sig. <0.05).

Tab. 4: Model confirms the suitability of the model

ANOVA[a,b] Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1169.811	5	233.962	442.627	.000[c]
	Residual	56.029	106	.529		
	Total	1225.840	111			

a. Dependent Variable: Innovation Performance.

b. Linear Regression through the Origin.

c. Predicators: We have the ability to design an extensive variety of new products. We are able to develop new products in a short time. We can quickly respond to changes in customer requirements and modify existing services. We are able to develop new services in a short time. We introduce new services in a short time.

Source: Authors.

The model explains 95.4% of the variability of the dependent variable. The model is of good quality.

Tab. 5: Model Summary

Model	R	**R Square**	Adjusted R Square	Std. Error of the Estimate
1	.977[a]	**.954**	.952	.72703

Source: Authors.

According to the standardized coefficients of innovation flexibility items (Table 3), it can be said which item has a greater and lesser impact on innovation performance. The biggest influence on the innovation performance is the item "We are able to develop new products in a short time" and then "We are able to develop new services in a short time." However, the

coefficients have the opposite sign. This means that item „We are able to develop new services in a short time" increases innovation performance and item "We introduce new services in a short time" reduces it. The smallest impact on innovation performance is " We have the ability to design an extensive variety of new products. "

4.   Discussion

The results show that the relationship between the items related to innovation flexibility and the items related to innovation performance are very often positive. The part focused on innovation flexibility in products has 18 positive correlations (from 25 possible ones). The part focused on innovation flexibility in accompanying customer services also has 18 positive correlations (from 25 possible ones). Totally, it means 36 items (from 50 possible ones) have a positive correlation. The findings identify positive correlations between the items related to innovation flexibility and the items related to innovation performance. The hypothesis H1 was confirmed, because is positively associated with innovation performance in small and medium manufacturing companies as was mentioned above. The biggest influence on the innovation performance has the item "We are able to develop new products in a short time" and then "We are able to develop new services in a short time." Item „We are able to develop new services in a short time" increases innovation performance and item "We introduce new services in a short time" reduces it. The smallest impact on innovation performance is " We have the ability to design an extensive variety of new products."

The hypothesis H2 related to total innovation performance is confirmed, but only for some items of innovation flexibility. Our findings indicate a positive and significant relationship between flexibility and innovation performance of SMEs, in line with the majority of previous studies in this field (Georgsdottir and Getz, 2004; Cingöza and Akdoğan, 2013 and Liao and Barnes, 2015). Li (2015) stresses that there is positive relationship between new technology implementation, flexibility of new technology and innovation performance. Georgsdottir and Getz (2004) and Cingöza and Akdoğan (2013) noticed that flexibility is a key element in the innovation process. Our results show that it is possible to see the positive relationship between innovation flexibility at products and innovation performance and innovation flexibility at accompanying services as well.

The originality of this paper is in the finding that there is a positive relationship between innovation flexibility in accompanying services and innovation performance. This relationship has not yet been proven. This result is useful for theory and for manufacturing companies as

well. Both innovation flexibility in product and innovation flexibility in accompanying services are important for innovation performance.

Manufacturers often perceive services only as a supplement to a product and do not realize their importance for business. However, these results show that companies should pay attention to both product and to accompanying services as well.

To sum up, the hypothesis H1 is confirmed, because innovation flexibility is positively associated with innovation performance in small and medium manufacturing companies. The hypothesis H2 is confirmed, but only for some items of innovation flexibility.

Conclusion

Our study shows a great deal of interesting information related to innovation flexibility in manufacturing companies. The findings of the research contribute to an understanding of the relationship between innovation flexibility and innovation performance. We believe that our findings have a valuable potential impact both on theory and practice.

Implications for theory: The items related to innovation flexibility and the items related to innovation performance very often have a positive relationship with each other. Thus the findings contribute to the theory that the same positive relationship exists between innovation flexibility in products and innovation performance and between innovation flexibility in accompanying services and innovation performance.

Implications for practice: Our study is considered to be the first empirical research in this area carried out among manufacturing companies in the Czech Republic. These companies pay attention to innovation flexibility related to products and innovation flexibility related to services come second. Results show that item „We are able to develop new services in a short time" increases innovation performance and item "We introduce new services in a short time" reduces it.

The limitations of this paper can be seen in the research, which was addressed only to the limited number of small and medium companies in one industry and only in the Czech market.

Our study opens up several concrete opportunities for future research. Future research should expand the investigative scope by examining other industries to confirm our findings gained or highlight differences.

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THE INFLUENCE OF PERCEIVED BRAND VALUE ON BRAND LOYALTY FOR SUSTAINABLE AND CONVENTIONAL BRANDS

Nindya Kinanti – Yeshika Alversia

Abstract

Purpose: The purpose of this study is to examine the influence of perceived brand value on brand loyalty amongst two cosmetic brands categories which are sustainable brand and conventional brand mediated by brand trust and brand affect. Another purpose of this study is to examine the influence of perceived brand value on brand trust and brand affect moderated by sustainability knowledge and fashion consciousness.

Design/methodology/approach: The data for this study is collected through an online questionnaire survey method and gathered a total of 232 responses from Indonesian females who use cosmetic products. The survey was conducted from September to November 2019. The hypotheses were tested using Structural Equation Modelling (SEM).

Findings: The results of this study indicate that perceived brand value significantly affect brand trust and brand affect which then affect brand loyalty in two brand categories (sustainable brand and conventional brand). The results also show that sustainability knowledge and fashion consciousness do not significantly strengthen the relationship between perceived brand value on brand trust and brand affect.

Research/practical implications: The results of this study give suggestions through its marketing communication for sustainable cosmetic brand and also for cosmetic brands as a whole.

Originality/value: This study attempts to modify the study by Park and Kim (2016) by applying them in Indonesia especially for the cosmetics industry and also by using willingness to pay premium, word of mouth, and repurchase intention as dimensions of brand loyalty.

Keywords: perceived brand value, brand loyalty, brand trust, brand affect, sustainability

JEL Codes: M31, L66

Introduction

There is an increase of sustainable products consumption across the globe (Nielsen, 2018). The increasing consumption of those products is due to the growing awareness among global consumers about environmental issue. Sustainability consists of environmental, social, and economics dimensions which often called as triple bottom line (Sahota, 2014). The growing interest about sustainability makes it a challenge for industries to meet consumers' demand to start paying attention to environmental and social issue. Cosmetics industry is one of the industries that also face the sustainability issues in its business practices. Animal testing and plastic waste from its packaging are the examples of environmental issues, whereas unfair trade such as child labor is one of the social issues within this cosmetics/skin care business (Sahota, 2014; Guardian, 2016).

Cosmetics is one of the growing industries in Indonesia as there is a 20% growth in 2018 and also projected to keep growing in the future years (The Ministry of Industry of the Republic of Indonesia, 2017; Euromonitor, 2018). In regards of the consumption of sustainable products, the Ministry of Industry also stated that consumers in Indonesia has a growing interest in products that are made by natural ingredients which indicated that there will be more demand for natural cosmetics and skin care. D'Souza (2006) stated that companies must design their strategy to create a sustainable competitive advantage and it could not be achieved by using the low-cost leadership or differentiation strategy alone. Green marketing is one of the marketing strategy examples that could be used by companies that pursue sustainability. Because there is a different effort each brand has, consumers could perceive each brand differently which could result in forming a different level of brand loyalty. Based on these differences, this study is aimed to examine the influence of perceived brand value on brand loyalty between sustainable brands and conventional brands with brand trust and brand affect as mediation variables. Based on the sustainable concerns among consumers, this study also aimed to examine the role of consumers' sustainability knowledge and fashion consciousness on the relationship between perceived brand value and brand trust/brand affect. The implications of this study will provide suggestions on building brand loyalty by shaping customers' perceived value through marketing communication.

1.   Literature Review

1.1   Perceived brand value, brand trust, brand affect, and brand loyalty

Previous studies already examined the antecedents of brand loyalty where it was found that perceived value is the main antecedents of brand loyalty (Bolton & Drew, 1991). Perceived value is an evaluation carried out by consumers based on an interpretation of what they received by comparing its benefits and costs (Kotler and Armstrong, 2001). Previous studies found that

perceived value is one of the behavioural factors in maintaining long-term customer relationship or to be loyal to a brand when the consumers have perception that the benefit they get is worth of value (Yang & Peterson, 2004). Brand loyalty is indicated by a repetition in using or consuming a particular brand and only prioritize the brand during purchase decisions (Oliver, 1999). In this study the brand loyalty is consisted of willingness to pay premium, word of mouth, and repurchase intention.

Brand trust is a result of considerations made by consumers about the brand's ability to keep their promises and claims (Chaudhuri & Holbrook, 2001; Erdem & Joffre, 2004). Chaudhuri and Holbrook (2001) stated that an important aspect of consumers in evaluating a brand depends on consumers' trust in brand's honesty, safety, and reliability.

Brand affect is a brand's ability to elicit an emotional response from consumers (Chaudhuri & Holbrook, 2001). These emotions arise during the consumption process of a product in the form of happiness, joy, and affection (Dick & Basu, 1994). This research categorized cosmetics/skin care products into two categories: sustainable and conventional brands. Consumers could have a different level of perceived values which could lead to a different level of trust and affection and in the end could form a different level of loyalty. According to Park & Kim (2016), sustainable brands tend to have a stronger brand trust whereas conventional brands tend to have a weaker brand trust. It is also stated that conventional brands have stronger brand affects and sustainable brands have weaker brand affects.Therefore, the hypotheses of this study are as follows:

H1: Perceived brand value positively affects brand trust.

H2: Perceived brand value positively affects brand affect.

H3: Brand trust positively affects brand loyalty.

H4: Brand affect positively affects brand loyalty.

H5: For sustainable brands, perceived brand value strongly associated with brand trust than with brand affect.

H6: For conventional brands, perceived brand value strongly associated with brand affect than with brand trust.

1.2   Sustainability knowledge

Awareness and concern for sustainability among consumers had made companies begin to introduce a variety of ethical product. Ethical product is a product where its production process considers sustainability whether it is from environmental or social aspects (First & Khetriwal, 2010; Ha-Brookshire & Norum, 2011). Consumers' knowledge for sustainability issues such

as eco-friendly fashion or the sweatshop issue within the fashion industry affected their support for sustainable brands (Park & Kim, 2016; Shen et al., 2012). From this research it could be concluded that consumers who have more knowledge about cosmetics/skin care products that are environmental friendly and socially responsible will strengthen the effect of perceived brand value on brand trust and brand affect on sustainable brands. Therefore, the research hypotheses are as follows:

H7a: For sustainable brands, consumers' sustainability knowledge strengthen the influence of perceived brand value on brand trust.

H7b: For sustainable brands, consumers' sustainability knowledge strengthen the influence of perceived brand value on brand affect.

1.3   Fashion consciousness

Fashion consciousness is an awareness each individuals have considering their physical appearance. The awareness of individual's physical appearance is not limited to fashion, but also including beauty products (Kim, Park, & Glovinsky, 2018). Iyer and Eastman (2010) stated that consumers who have fashion consciousness tend to shop more often and price sensitive as they will compare brands and choose the cheaper price. Consumers who have fashion consciousness don't intend to buy products from sustainable brands because they have perceptions that the product is not fashionable and does not follow the latest trend (Meyer, 2001; Kang & Kim, 2013). Those findings indicated there was an inverse relationship between sustainable products and one's consciousness over their physical appearance. Thus, consumers who have high fashion consciousness tend to prefer brands that follow the latest trends. Therefore, the hypothoses of this reasearch are:

H8a: For conventional brands, high fashion consciousness will strengthen the influence of perceived brand value on brand trust.

H8b: For conventional brands, high fashion consciousness will strengthen the influence of perceived brand value on brand affect.

Fig. 1: Research Framework
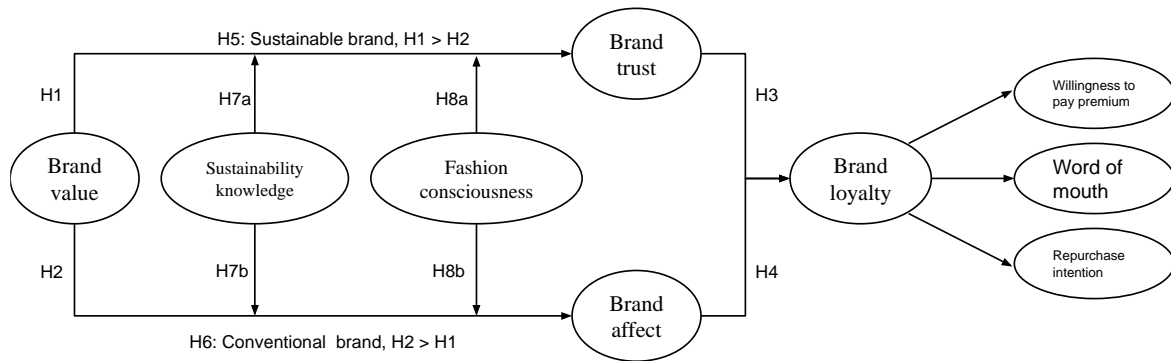
2. Methodology

2.1 Data collection method

The data was collected through an online questionnaire which consisted of several sections; (1) screening question that contains 8 brands the respondents must choose based on which brand they use the most, (2) measurement items using 6-point Likert scales, and (3) demographic information.

Tab. 1. Measurement items

Construct	Measures	Source
Perceived brand value	I am happy with the value for the money I get at brand [XYZ].	Harris and Goode (2004)
	Cosmetics and skin care products from brand [XYZ] are excellent value for the money	
	[XYZ] brand has excellent benefits for every cent.	
	[XYZ] brand have quality products that are worth every cent.	
Brand trust	[XYZ] brand delivers what it promises.	Chaudhuri and Holbrook (2001)
	[XYZ] brand's claims are believable.	
	Over time, my experiences with [XYZ] brand have led me to expect it to keep its promises, no more and no less.	
	[XYZ] brand has a name you can trust.	
	[XYZ] brand doesn't pretend to be something it isn't.	
Brand affect	I feel good when I use brand [XYZ].	Chaudhuri and Holbrook (2001)
	[XYZ] gives me pleasure.	
	[XYZ] makes me happy.	
Willingness to pay premium	I am likely to pay a bit more on [XYZ] brand.	Jones and Taylor (2007)
	I am likely to spend more money on [XYZ] brand.	
	I am willing to set aside my money to buy from [XYZ] brand.	
	I am willing to buy from brand [XYZ] even though it is more expensive than other brands.	
Word of mouth	I recommend brand [XYZ] to others.	Molinari, et al. (2008)
	I say positive things about [XYZ] to others.	
	I encourage other people to buy from [XYZ].	
	I tell my experience of using [XYZ] to others.	
	I say good things from [XYZ] to others.	
Repurchase intention	If I need cosmetics/skin care, I will buy from [XYZ] again.	Sullivan and Kim (2018)
	I will buy cosmetics/skin care from [XYZ] again in the future.	

Construct	Measures	Source
	[XYZ] is my first choice when I want to buy cosmetics/skin care.	
	I will buy cosmetics/skin care from [XYZ] in the near future.	
Sustainable brand image	[XYZ] brand adopts environmentally friendly business practices (eco-friendly).	Park and Kim (2012)
	[XYZ] brand does not conduct animal testing.	
	[XYZ] brand adopts fair-trade system.	
Sustainability knowledge	I am knowledgeable about the social issue in cosmetics/skin care business.	Shen, et al. (2012)
	I know more about socially-responsible cosmetics/skin care business than the average person.	
	I am informed about the environmental issue in the cosmetics/skin care business.	
	I understand the environmental impact in the cosmetics/skin care business.	
	I am knowledgeable about cosmetics/skin care brands that sell environmentally friendly products (eco-friendly).	
Fashion consciousness	I often try new cosmetics/skin care brands before others do.	Kim and Lee (2000)
	I usually have one or more cosmetics/skin care that are the latest.	
	I like to try new cosmetics/skin care brand just to see what they are.	
	When I must choose between appearance and comfort, I usually choose appearance.	
	I often try the latest cosmetics/skin care brand.	

1.1 Brand selection and grouping method

The list of brands for the screening questions were selected based on a survey reported in ZAP Beauty Index (2018). The survey found that there were 6 brands Indonesian women most frequently use: SK II, Laneige, The Body Shop, Innisfree, Nature Republic and Wardah. These brands were then categorized into sustainable and conventional brand. The criterias were based on brand's commitment to pursue sustainability in its business practices from the beginning (Parker & Dickson, 2009). Based on the criteria, the grouping of brands is as follows.

Tab. 2. The grouping of sustainable and conventional cosmetics/skin care brands

Sustainable brand	Conventional brand
The Body Shop	SK II
Innisfree	Laneige
L'Occitane	Nature Republic
Sensatia Botanicals	Wardah

The researcher then added two other brands that also fit the criteria for a sustainable brand based on brand history: L'Occitane and Sensatia Botanicals. L'Occitane was founded based on values that maintain a balance between "men and the environment" and are sustainably-sourced. Sensatia Botanicals is a brand of natural skin care that was established as a profit-sharing cooperation with local Balinese communities. To test that these brands were

perceived differently by respondents, independent sample t-test was conducted with the same sample data by using sustainable brand image variable (Table 1). The results showed that there is a significant difference in sustainable brand image for both brand categories.

2.2   Respondents profile

This study used non-probability sampling technique specifically convenience sampling. Women over 18 years old who were the users of cosmetics and skin care products became the criteria for sample selection. The respondent must choose one brand they used most often among 8 brands in Table 2. If the respondent has never used one of those brands, then they cannot be included as a research sample.

The data were collected from September to November 2019. Among 232 respondents, 105 respondents chose sustainable brands and 127 respondents chose conventional brands. The majority of respondents were aged 23-27 (71.6%), residing in Jakarta (39.7%), earned Bachelor degree (79.7%), and have occupation as private corporate employees (37.5%). Most of the respondents bought cosmetics/skin care products 3-4 times in the last 6 months (34.9%), allocated 10-19% of their monthly income to be spent on cosmetics/skin care products (35.3%). Through this demographic profile, it is also shown that cosmetics/skin care products that suitable for their skin is the main reason of them purchasing from the chosen brand (87.1%).

3.   Results

3.1   Confirmatory analysis and Goodness of Fit

Confirmatory factor analysis (CFA) was done through goodness of fit of measurement model, validity test, and reliability test using SPSS AMOS version 24. The results showed that all measurements in this study are valid with standardized loading factor (SLF) ≥ 0.50. The measurements in this study are also reliable with CR $\geq 0,70$ and VE $\geq 0,50$. The goodness of fit of structural model resulted in a good fit (RMSEA=0.047; CFI=0.917; IFI=0.918; TLI=0.910; CMIN/df=1.503).

3.2   Hypothesis testing

The hypothesis testing was carried out through a multi-group analysis method among sustainable brands (n=105) and conventional brands (n=127). From the hypothesis testing it was found that H1 to H4 are supported where there were positive and significant influence of perceived brand value on brand trust and brand affect in both brand categories (Table 3).

Tab. 3: Hypothesis testing results (H1-H4)

Path	Sustainable brand				Conventional brand			
	SLF	*t-value*	P	Result	SLF	*t-value*	P	Result
Core model								
Perceived brand value → Brand trust	0.872	7.392	< 0.001	H1 supported	0.786	7.833	<0.001	H1 supported
Perceived brand value → Brand affect	0.740	8.124	<0.001	H2 supported	0.840	9.551	<0.001	H2 supported
Brand trust → Brand loyalty	0.494	4.235	<0.001	H3 supported	0.393	3.636	<0.001	H3 supported
Brand affect → Brand loyalty	0.442	4.275	<0.001	H4 supported	0.554	4.823	<0.001	H4 supported

To test H5, a chi-square comparison was conducted on the sustainable group data. The comparison is done by comparing the chi-square value in the constrained model and the unconstrained model. The result indicated that the influence on perceived brand trust is not significantly stronger than the influence of perceived brand value on brand affect (Δx^2=1.192; *p-value*=0.275), therefore H5 is rejected. The same procedure was also applied to test H6. The result indicated that the influence of perceived brand value on brand affect for conventional brand is also not significantly stronger than the relationship of perceived brand value on brand trust (Δx^2=0.723; *p-value*=0.395), therefore rejecting H6.

Tab. 4: Hypothesis testing results for moderating effects

Path	Sustainable brand				Conventional brand			
	SLF	*t-value*	P	Results	SLF	*t-value*	P	Ket.
Sustainability knowledge on Perceived brand value → Brand trust	-0.095	-1.412	0.158	H7a rejected				
Sustainability knowledge on Perceived brand value → Brand affect	-0.006	-0.086	0.931	H7b rejected				
Fashion consciousness on Perceived brand value → Brand trust					-0.115	-1.816	0.069	H8a rejected
Fashion consciousness on Perceived brand value → Brand affect					-0.057	-0.936	0.349	H8b rejected

The moderating effects of sustainability knowledge and fashion consciousness were tested. From the hypothesis results it was indicated that for sustainable brands, consumers' sustainability knowledge does not significantly strengthen the influence of perceived brand value on brand trust and brand affect, thus rejecting H7a and H7b. For conventional brands, the

results also indicated that fashion consciousness does not significantly strengthen the influence of perceived brand value on brand trust and brand affect, thus rejecting H8a and H8b (Table 4).

4.   Discussions

The results from the core model indicated a positive and significant relationship between perceived brand value and brand trust in both sample groups (sustainable and conventional brands). These results are consistent with previous studies by Park and Kim (2016) and Chen and Chang (2012). Perceived value, especially in green products, has influence in building green trust which makes perceived brand value an important factor in maintaining a long-term customer relationship. It is concluded that the trust level customers have on a brand will increase if the brand could give additional value or benefit in comparison of costs or efforts. Perceived brand value has a positive and significant influence on brand affect in both sample groups. This means that when a brand could give more benefits in comparison of its costs and efforts, it could elicit a good feeling and happiness from consumers.

Brand trust and brand affect have a positive and significant influence on brand loyalty in both groups supporting Park and Kim (2016) and Song et al. (2019). Trust is one of the main factors in maintaining long-term relationships with customers which result in customers' brand loyalty. Brand loyalty in this study is consisted of willingness to pay premium, word of mouth, and repurchase intention. The results showed that customers' brand loyalty for sustainable brands was shown through word of mouth where they tell their experience of using the chosen brand to other people. This could indicate that consumers could encourage others to do good by consuming sustainable products. For conventional brands, customers' brand loyalty was shown through repurchase intention.

For the moderating effects, the result showed that sustainability knowledge does not significantly strengthen the relationship between perceived brand value and brand trust/brand affect for sustainable brands. The data shown that the respondents have enough sustainability knowledge in cosmetics/skin care business. Meanwhile, the independent sample test shown that there is no significant difference of sustainability knowledge between two sample groups. Thus, consumers' knowledge about sustainability issues is not their primary consideration for choosing cosmetics/skin care brands.

For conventional brands, the result indicated that fashion consciousness does not significantly strengthen the influence of perceived brand value on brand trust and brand affect. It indicated that although cosmetics/skin care products are related to enhance physical appearance, there are factors that make fashion consciousness does not strengthen the relationship between

perceived brand value and brand trust/brand affect. To justify this result, the collected data showed that the average of respondents do not have a high level of fashion consciousness and it was also shown that majority of respondents choose cosmetics/skin care products that suit their skin type. It could be concluded that consumers still prioritize products that suit their skin type when choosing a cosmetics/skin care brand, not because the brand pursues sustainability approach in its practices or because the brand has variant of products that has the latest trends.

Conclusions

This study examined the influence of perceived brand value on brand loyalty which was observed among sustainable and conventional cosmetics/skin care brands. The result showed that perceived brand value has a significant influence on brand trust and brand affect. Brand trust and brand affect also has a significant influence on brand loyalty, which was shown through word of mouth for sustainable brand and through repurchase intention for conventional brands.

The study gave a result that brand trust has a role for maintaining customers' brand loyalty for sustainable brands. Brand managers could enhance customers' perception through integrated marketing communications by consistently communicating their contributions through content marketing.

For conventional brand and also for cosmetics/skin care brands in general, brand loyalty could be maintained by considering the emotional response that customers elicit ('feeling good' and 'happy'). Brand managers could consider the visual aspects in its marketing communication strategy. For example, brands could use models who have various body types and skin colors that could truly represent women, especially Indonesian women. This strategy is hoped to enhance happiness for consumers and give positive and good feeling when they use the products from the chosen brand.

For entrepreneurs who want to create a beauty brand should start with knowing what values that drive their customers through survey, for example. After knowing the value then the recommendations mentioned before could be taken as consideration in communicating their visions as a new beauty brand. These strategies are hoped to convince company's stakeholders if executed effectively. For example, it helped investors to believe that there is more beyond product quality as customers also have different values that drive their consumption, or it also could drive transparency from its suppliers to make sure its materials are sustainably sourced.

This study still has some limitations. The first limitation lies in the screening process where the list of brands was limited to 8 brands as researchers have limitation in grouping every

brand to sustainable and conventional brand categories. The limited selection of brand could also indicate that the higher usage frequency does not mean it is a favorable brand. Future studies could consider to give another alternative to brand selections to gather a lot more participants, using an experimental method, and apply the models in other industries.

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BUSINESS INCUBATION IN DEVELOPING ECONOMIES: A CASE STUDY OF PARAGUAY

Augustinus van der Krogt - Cecilia López

Abstract

Purpose: This research evaluates the contribution of business incubators supporting entrepreneurship to meet the challenges the sector faces in Paraguay.

Design/methodology/approach: The research applies a case study approach covering data on the operations and outcomes of all 25 business incubators active in 2018 in Paraguay. The findings of the case study are compared with secondary data on business incubation in other developed and developing economies, taken from international academic articles and studies.

Findings: The study finds that the focus of the Paraguayan incubator programs on the pre-incubation phase aligns with the need to develop stronger basic entrepreneurial skills and business idea generation in developing countries. The research also indicates that the Paraguayan incubator ecosystem is successful in the creation of innovative start-ups and micro-enterprises but that a lack of data on companies that have left the incubators limits evidence on the mid and long term impact on revenues and job creation. Similar to other countries, longer term effectiveness and expansion of incubator programs are limited by the lack of funding resources.

Research/practical implications: The study contributes to the important discussion on the choices policy makers and practitioners in the incubation sector need to make: to support innovative and scalable start-ups or micro-enterprises that arise out of necessity in developing economies. The research furthermore indicates a need to conduct comparative and quantitative research on the longer-term impact of business incubators on value creation and employment in developing economies, clearly distinguishing between the impacts generated by start-ups and micro-enterprises.

Originality/value: The study provides a first analysis of the incubator sector in Paraguay and contributes to the discussion on the importance of supporting scalable and innovative start-ups or micro-enterprises in developing economies.

Keywords: business incubators, start-ups, subsistence entrepreneurship, pre-incubation, developing economies

JEL Codes: L26, M13

1.   Literature Review

Various researchers have tried to explain key factors that support entrepreneurship and self-employment. Dvouletý et al. (2018) found that country specific factors such as a less favourable business environment and bureaucracy, that hampers new ventures, affect entrepreneurship and self-employment. High levels of unemployment can lead to self-employment out of necessity but do not necessarily generate new and innovative businesses (Al-Mubaraki & Busler, 2013). In this context, business incubators were born with the goal of establishing successful start-ups, which upon graduation from the incubation program are financially stable and sustainable, can create jobs, facilitate technology transfer and thus have a positive impact on the economy (Al-Mubaraki & Busler, 2013). Although incubator programs tend to contribute successfully to the rise in self-employment, research evidence is still not conclusive on the impact in terms of the wider generation of additional revenues and job creation compared to companies not supported by business incubators (Lukeš et al., 2019).

To better understand the impact of business incubators in a particular country such as Paraguay, this study first analyzes the incubation process and the types of business and services that can be supported by the business incubator sector.

Business incubation phases

The business incubation process covers three basic phases: pre-incubation, incubation and acceleration. The pre-incubation stage can be defined as the period of time where prospective entrepreneurs check their business model and plan in a safe space (Voisey et al., 2013). During this phase, they work on business feasibility, acquire technical knowledge and develop the soft skills needed to move forward with their venture. Particularly in developing countries, where general entrepreneurial conditions are more limited in terms of the overall business environment, entrepreneurial capacity and conditions for starting new businesses, there is a need for an elaborate and integrated business pre-incubation process.

Incubation is defined as a combination of processes and resources aimed to help fledgling ventures grow by supporting them in their early development days (Bruneel et al., 2012). Services offered by the incubators include business support services, office space, networking opportunities and access to funding (Lukeš et al., 2019; Bruneel et al., 2012). Incubation times may vary between one and three years (International Business Innovation Association, 2017). Ventures that complete the incubation program must be financially viable and have the potential to create employment and strengthen the economy (Bruneel et al., 2012). To speed up the incubation process, pre-accelerator programs have emerged in some countries that support

business ideas that are more quickly scalable with the same incubator services but work on the basis of a highly intensive three to six months program (Bone et al., 2017).

Finally, accelerator programs seek to accelerate the growth of start-ups in terms of revenues and employment. Acceleration programs provide start-ups with seed funding, mentoring and conclude with an event where companies present investors their product (International Business Innovation Association, 2017).

Start-ups and micro-enterprises

According to Schoar (2010), transformational entrepreneurship relates more to the traditional type of start-up where individuals start a business with the objective of establishing *innovative and scalable start-ups* that develop innovative products and services, in particular related to technology, and have the potential to create business value and employment opportunities at national level. We find that most studies focus on the incubation process of these scalable and innovative start-ups.

On the other hand business incubators in many developing economies also support subsistence entrepreneurship. In this case individuals start *micro-enterprises* out of necessity, with the objective of generating income for themselves to survive. Schoar describes the micro entrepreneur as a person who runs small-scale operations that do not grow into larger firms and will not create employment opportunities for other actors in the economy. In most developing economies the vast majority of entrepreneurs are subsistence entrepreneurs that operate micro-enterprises (Schoar, 2010). As a result, policy makers and practitioners have an important choice to make when deciding on whether they should focus on the support of innovative and scalable start-ups or of micro-enterprises.

On the basis of the earlier definitions, the following model is presented, it shows the three incubation phases and outputs in terms of the type of companies and is used as a basis to describe the outputs of the incubator sector in Paraguay.

Figure 1: Incubation phases and outputs
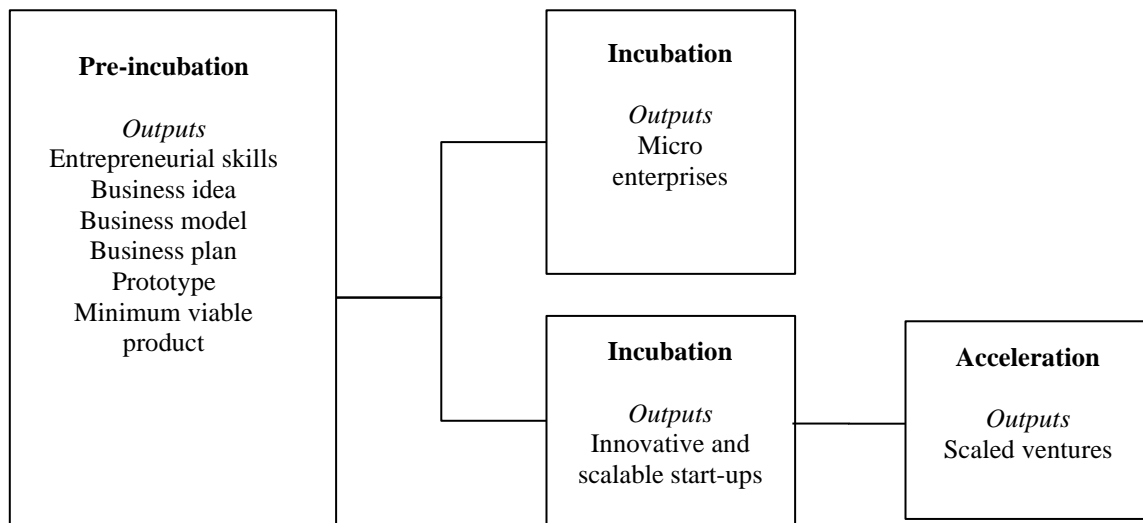
Source: Authors.

Incubator services

The literature on incubation indicates there was an evolution in the types of services offered during the different incubation phases in order to ensure successful business incubation. In the beginning, services were limited to offering infrastructure and shared resources to promote economies of scale among a group of entrepreneurs; this was expanded with coaching services and training of entrepreneurs by the incubator during the incubation process. More recently (see Table 1) the incubators have also sought to provide seed funds and access to mentors and an external network of advisors providing technological, legal and financial expertise and advice (Bruneel et al., 2012). A recent study on incubator services in the Netherlands and South Africa found that networks and partnerships with peers, management, local businesses, universities and government are most important for incubator success, followed by mentorship, coaches and skills training (Meyer, Meyer, & Kot, 2016).

Table 1: Business incubation services offered in the different incubation phases

Phase	Services
Pre-incubation	Business competences, idea generation, business model development, business planning, development prototype or MVP.
Incubation	Mentoring & advice on human resources, finance, sales, marketing and technology, local level networking, seed capital
Acceleration	Mentoring & tailor-made advice on human resources, finance, sales, marketing, technology, advice on organization and change management, advice on internationalization, international level networking with peers, providers, clients and investors, access to venture capital

Source: Bruneel, et al (2012) and authors.

2.   Research Method and Research Questions

The purpose of this study is to answer the following two research questions:

1. How important are incubation programs in supporting entrepreneurship in Paraguay?
2. What are the key challenges of business incubators in Paraguay?

This study uses a case study approach as defined by Yin (2015) as "an empirical method that investigates a contemporary phenomenon within its real life context, especially when the boundaries between a phenomenon and context are not clear and the researcher has little control over the phenomenon and context" (p. 15). This research method allows for flexibility and a better understanding of practical findings and comparison with findings of studies on incubation programs in other countries.

This study is based on a collection of data on business incubators in Paraguay by researchers from the Universidad Paraguayo Alemana (UPA) in collaboration with the Ministry of Industry and Commerce of Paraguay. The study garnered data on the activities and outputs of all 25 business incubators active in Paraguay in 2018, thereby allowing a fully representative multiple case selection, permitting a strong data analysis and understanding of the functioning of business incubators in Paraguay. The study used as a primary source data collected on the basis of questionnaires and interviews with representatives of different institutions offering services of pre-incubation, incubation and/ or acceleration. These interviews were between one and two hours long and were carried out between August and November of 2019. Each of the questionnaires and interviews were analysed to serve as a basis for the search for a logic that can be compared with generic findings on business incubators found in studies on other countries.

3.   Business incubation in Paraguay

Answer Research Question 1: How important are incubation programs in supporting entrepreneurship in Paraguay?

Paraguay is an upper-middle income country with a GDP per capita of US\$ 5821 and a highly unequal income distribution as indicated by a Gini index of 48.8 in 2018 (World Bank, 2020). As in most economies, the economic structure in Paraguay is strongly dependent on self-employment, with microenterprises making up over 96% of the total number of companies. Out of these, almost 61% are not registered, 71% do not have a bank account and 37% are registered as one-person company (Dirección General de Estadística, Encuestas y Censos, 2011). This makes Paraguay strongly dependent on its entrepreneurial conditions.

The entrepreneurial environment in Paraguay in general is strongly lagging behind others, as demonstrated in its latest ranking at 125 out of 160 countries in the Doing Business study of the World Bank (World Bank, 2020). The study indicates that there is a lack of promotion of creativity, self-sufficiency and initiative, as well as basic teaching of market and entrepreneurship principles in basic education. It is very difficult to start a new company, to import and export products and services, and to fulfill tax regulations and to overcome bankruptcy. There is insufficient availability of regular bank credits, government subsidies and alternative finance to support new firms. Compared to many countries in the region, there is a lack of effective programs and support for new and growing business incubators.

Output and impact of business incubators

Given the limiting entrepreneurial conditions, business incubators can have an important contribution in promoting and supporting entrepreneurship in a developing economy such as Paraguay. The incubator ecosystem in Paraguay has grown rapidly from 10 business incubators active in 2017 to 25 operational business incubators in 2018. The incubator sector includes a highly varied group of institutions including four public institutions, four NGOs, five private companies and eleven universities with eighteen incubators based in the capital city of Asuncion and seven incubators operating in smaller rural cities. The incubators usually have a very small number of administrative staff and can have a network of between ten and hundred mentors and advisors. Considering the limited size of the Paraguayan economy and number of businesses, this number compares positively with other countries such as Italy (24), Slovakia (32), Belgium (33), Czech Republic (52), Spain (109) or the United Kingdom (300) (European Commission, 2018).

Table 2: Pre-incubation, incubation and acceleration programs in Paraguay 2018

	Programs for micro-enterprises	Programs for scalable and innovative start-ups
Pre-incubation	10	12
Incubation	3	7
Acceleration	1	3

Source:Authors.

Furthermore, given the limited entrepreneurial capacities in Paraguay, there is an important role for pre-incubation programs that provide entrepreneurial education and support the development of business ideas and business plans. This need is reflected by the high number

of business incubators (22 out of 25) that offer a pre-incubation program in Paraguay and the high output of these programs (see Table 2). Eight of the business incubators, representing 30% of all incubators, operate programs in rural areas outside the capital of Asuncion.

The majority of these programs are focused on the pre-incubation phase, offering entrepreneurial education and the generation of business ideas and business planning. In 2018 the incubators supported over 2700 entrepreneurs in the pre-incubation phase. This confirms the growing importance of developing basic entrepreneurial skills to generate successful entrepreneurship in developing economies (Voisey et al., 2013).

Table 3: Outputs business incubator programs in Paraguay 2018

	Pre-incubation	**Incubation**	**Acceleration**
Innovative and scalable ventures	1202	54	33
micro-enterprises	1530	947	204
Total	2732	1001	237

Source: Authors.

Given the recent development of the incubator ecosystem, we found in 2018 that just 10 organisations offering incubation programs were able to generate over 1000 new ventures in 2018 (table 3). Although it is difficult to find accurate data on the number of companies incubated, these numbers may be considerable when compared with data on the United Kingdom and Spain with respectively 12000 and 1783 incubated companies in 2018 (European Commission, 2018).

This represents a conversion rate of business ideas developed into implemented businesses of 36%. Although few data exist on the conversion rate, this percentage appears to be high when compared to findings in other countries. A study on Business Innovation Centers in five countries in Europe found an average conversion rate of 11% (European Commission, 2018). In addition, the four acceleration programs in Paraguay were able to support the acceleration of a total of 237 micro-enterprises and scalable and innovative business ventures in 2018. While this is still a limited number, a start is being made in Paraguay on supporting entrepreneurs in their acceleration process.

Despite the promising number of incubated and accelerated micro-enterprises and scaleups, the study found that most incubators do not monitor the performance of companies that have graduated from incubator or accelerator programs. Therefore their impact and

contribution to the generation of revenue and jobs cannot be evaluated. In line with earlier findings in the study by Lukeš et al. (2019), it is likely that both micro-enterprises and start-ups contribute primarily to the self-employment of participating entrepreneurs, with a limited initial revenue growth perspective (Lukeš et al, 2019).

Support to start-ups and micro-enterprises

Most incubation programs in Paraguay support innovative and scalable start-ups, which confirms findings in the literature about the focus on harnessing technology and innovation for economic development in developing countries (Lalkaka, 2003). However, the study on Paraguay indicates that business incubators support far the micro-enterprises than scalable and innovative start-ups. While there is no proof of a deliberate policy of the incubators in Paraguay, this may respond to the elevated presence of the micro-entrepreneurs that operate out of necessity in Paraguay. This is in line with Lalkaka (2003), who indicated that the focus of business incubators on microenterprises is something born out of the necessity of supporting underprivileged segments, especially in rural areas. Further explanation of the strong representation of micro-enterprises may also be a result of the fact that eight out of the 25 business incubators to be found in rural areas outside the capital city of Asuncion, which allows participation in the incubator programs by micro entrepreneurs in these marginalized rural areas.

The role of universities

The study also shows that Paraguayan universities play an important role in the incubator ecosystem. Out of the pre-incubation of scalable and innovative ventures in Paraguay, over 96% of these ventures are pre-incubated through 11 universities' programs. The number of universities involved in pre-incubation is high compared to other countries where data are available, such as the Czech Republic (8) or Slovakia (4) (European Commission, 2018). The involvement of universities in the entrepreneurship ecosystem responds to the need to establish a linkage between academia and entrepreneurship, and gives academics the opportunity of developing their business ideas and plans and testing them without immediately opening a company (Wirsing et al., 2002). Even if these programs do not directly generate new businesses, the development of basic business and entrepreneurial skills and attitudes contributes in the longer term to the overall improvement of the entrepreneurial environment.

Answer Research Question 2: What are the key challenges for business incubators in Paraguay?

The study collected detailed data on the services provided to entrepreneurs in the different incubation phases by all 25 business incubators in Paraguay. Most incubators provide the key services that are provided by pre-incubation programs, including entrepreneurial skills and the development of a business model, business plan and a minimum viable product (see Table 4). A number of incubator programs fail to offer essential services in the incubation phase such as advice on human resources, financial and legal matters, property rights, office space and networking. We also found a limited development of key support services such as networking with investors and internationalization during the acceleration phase.

Table 4: Services provided by incubation programs 2018

Phase	Type of Service	% of incubators that offer this service
Pre-incubation	Entrepreneurial Skills	85%
	Business Model and/or Plan	100%
	Minimum Viable Product and/or Prototype	71%
Incubation	Strategy	85%
	Property / Copyright	50%
	Human Resources	68%
	Finances & Legal advice	68%
	Commercialization	85%
	Office Space	62%
	Networking with suppliers and clients	50%
	Elevator pitch	53%
Acceleration	Networking with investors	38%
	Internationalization	25%

Source: Authors.

According to other studies, access to funding to cover administration and services is one of the primary obstacles to the successful operation of business incubators in both developed

and developing countries (Lalkaka, 2003; Meyer et al., 2016). Paraguay is no exception and the business incubators interviewed consider the lack of financial resources as their biggest challenge. Most institutions receive limited funding from their sponsoring institution (e.g: universities, local government), do not charge for services and do not participate in the revenues or profits of the business ventures supported.

As a result most incubators are not able to provide an integrated package of services that a business incubator should offer to support successful business ventures. This is particularly the case in the phase of business incubation, where only a minority of the incubator programs in Paraguay offer more specialized advice on intellectual property rights, financial and legal challenges, networking and office space. In the acceleration phase, most incubators do not support internationalization and networking with peers, providers and investors, which can directly affect the success of the business incubator during the acceleration phase (Meyer et al., 2016).

The study also shows that the lack of financial resources of incubators affects the quality of the mentors and advisors that assist the incubation process. Many of the incubators rely on pro-bono mentors that do not possess national and international business experience. The lack of mentors and coaches can directly affect the effectiveness of the incubators, as shown by other studies on business incubators in Italy and South Africa (European Commission, 2018; Meyer et al., 2016).

Finally, only one third of the incubator programs provide seed capital to incubated ventures. The lack of seed capital is particularly difficult in the case of a developing country like Paraguay, where 71% of entrepreneurs do not have access to bank credit (Dirección Nacional de Estadística, Encuestas y Censos, 2011). This limits both the initial investment in a new micro enterprise or start-up, and strongly limits the chances of scaling up ventures in the longer term.

Conclusions and discussion

In Paraguay, the incubation ecosystem started only recently, but has grown from 10 incubators in 2015 to 25 business incubators in 2018. The initial success of the incubation programs can be confirmed by the relatively high number of incubated and accelerated businesses and a conversion rate of business ideas into operational business ventures of 36%, which is higher than in other countries.

The pre-incubation phase is the primary focus of incubator programs in Paraguay with a strong contribution from universities. This corresponds to the trend in other developing

economies where a need has been found to develop stronger basic entrepreneurial skills and idea generation before focusing on incubation and acceleration.

Despite the initial results, the research indicates, similar to other countries, that the lack of funding resources is a main challenge for most incubators in Paraguay. This directly affects the provision of an integrated package of mentoring and advisory services, hampers the hiring of experienced mentors and advisors and limits the provision of seed capital to incubated and accelerated ventures. These obstacles prevent incubator programs from sustaining their activities and securing longer term support and monitoring of the local and national economic impact of incubation in Paraguay.

Furthermore, a lack of data on graduated companies still limits evidence about the mid- and long- term impact on revenues and job creation by business incubators in Paraguay. We therefore recommend conducting future comparative and quantitative research on the actual contribution of the incubator sector to the generation of revenues and employment in Paraguay and in other countries.

Finally, the study contributes to the discussion on the choice between supporting start-ups or micro-enterprises in developing economies with a limited development of their entrepreneurial conditions, such as Paraguay. The focus of most research and incubator programs is on the incubation of innovative and scalable start-ups that seek to create value and employment on national and international level. However, in developing countries such as Paraguay, we see that incubators have been able to support many micro-enterprises which can contribute to self-employment and have an impact on local development. It is possible that micro ventures in developing economies contribute more to economic development than start-ups. Therefore, it is important to conduct future comparative research on the economic impact of incubators on both start-ups and micro-enterprises. These findings can assist policy makers and practitioners in developing economies to set better priorities in their business incubator programs.

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PERSONAL BANKRUPTCIES AND THEIR RECOVERY RATE

Jan Kubálek

Abstract

Purpose: The paper focuses on personal bankruptcies which are analysed from the creditors' point of view. The aim is to determine the recovery rate in the Czech Republic. There are two main groups of creditors: secured and unsecured. Recovery rates specify the level of satisfaction of creditors' claims.

Design/methodology/approach: The recovery rates will be calculated and provided separately for secured and unsecured claims. The data sample is obtained from an online available insolvency register. The analysed insolvency cases are extracted according to the most frequent surnames and first names in the Czech Republic. Insolvency proceedings documents are manually processed. Data were analysed using summary statistics and ANOVA testing.

Findings: The results show that unsecured claims are more frequent than secured claims in the cases of personal bankruptcy. However, secured claims achieve higher absolute values. The recovery rates are surprisingly comparable for both groups (72% for secured group and over 68% for unsecured one). The observed values tend to be much higher than in corporate defaults and, in the case of unsecured claims, they exceed significantly the minimum legal requirement.

Research/practical implications: This paper has practical implications for possible legal changes in this area, and for corporate risk systems used for mitigation of default consequences. This paper creates bases for the further international comparison. It should be emphasized that this paper focuses only on one factor. Future research could focus on other relevant aspects of insolvency proceedings, such as time frame, creditor structure, dependencies between variables. Explanatory variables might include gender, education, age, region, income, type of income and the dependent variables would be time and recovery rate.

Originality/value: The original contribution is based on the unique process of extracting cases from the insolvency register which should ensure a near-representative sample, although the number of insolvency cases cannot be considered as statistically significant.

Keywords: debt relief, recovery rate, creditors' satisfaction, Czech Republic

JEL Codes: G33, K35

Introduction

Personal bankruptcies comprise the insolvency of non-self-employed individuals. Individuals in the Czech Republic can file for insolvency according to Act No. 182/2006 Coll. on Insolvency and its Resolution (generally called Insolvency Act) if they have at least two creditors and they are unable to pay off their debts. Debt relief may be resolved by means of a repayment schedule, monetization of assets, or a combination thereof. Despite the difficult and painful process, people get a chance to discharge the remaining debts after the insolvency proceedings are finished. These people do not have incentives to escape into grey economy. It influences the quality of the business environment from different points of view. Firstly, they stay motivated employees, secondly, they can repay the part of their debts as responsible debtors, thirdly, they will spend their future incomes as classical consumers, fourthly, creditors may behave within the law and with the vision of repayment. Traczynski (2019) points out that bankruptcy law influences the decisions of entrepreneurs and small- business credit markets. Staszkiewicz and Morawska (2019) follow that Polish insolvency proceedings are insufficient and therefore creditor protection is crucial for attracting investments.

This paper focuses on the results of insolvency proceedings. It analyzes the recovery rate achieved from the creditors' point of view. The aim of the paper is to quantify the percentage of claims satisfied to affected creditors. Filling for insolvency has negative consequences. In the case of personal insolvencies, these consequences are detectable especially for creditors: unpaid claims mean the loss of their wealth and inability to restore it from these same entrepreneurial opportunities. This paper determines if a significant proportion of claims remains unpaid and if there are differences between secured and unsecured claims. The answer to this question is essential for any possible modification of the insolvency law. Legal norms should not be changed without an account of the current state of affairs and without knowing the reasons behind the results observed. Contrariwise, Nakajima (2017) proves that the reform of insolvency law may improve welfare and smooth consumption. The Czech insolvency law is in line with current trends and the patterns applied in the most developed economies. However, the Czech Republic differs in its institutional and cultural framework. It seems that the results of corporate insolvencies are especially affected by these reasons. The Czech results should be compared with international experience in the future. The paper follows the structure of a standard academic research publication.

1.   Literature review

Personal bankruptcies and related debt relief can be analysed from different points of view. Although according to Draghici (2015) they are mostly the issue of legal framework, other authors have taken microeconomic (Fišerová and Paseková, 2016), macroeconomic (Kubálek, et al., 2017), or social perspectives (Paseková and Bařinová, 2013). As stated in the Introduction, this paper focuses on the microeconomic consequences of personal bankruptcies on affected creditors. Succurro (2012) points out the macroeconomic relationship of the efficiency of insolvency system and the share of investment on GDP.

Personal bankruptcies are triggered by significant changes occurring in individuals' lives or by insufficient individual financial literacy. The relationship between financial literacy and social standing was confirmed internationally by Jappelli (2010). Paseková and Bařinová (2013) found that the most affected debtor group in the Moravian-Silesian Region were people with primary education and the lowest level of financial literacy. Belas et al. (2016) caution that there is significant room for improvement of financial literacy among students in the Czech Republic and Slovakia. Lucas and Moore (2019) focused on students' learning how to optimize student loans.

The issue of personal bankruptcies still remains underresearched. Despite some pioneering research works, the attention is considerably lower than in the case of corporate defaults. As the first Czech authors, Paseková and Bařinová (2013) analysed the structure of debtors according to age, gender, education, and source of income. A similar account was provided by Hospodka et al. (2015), who added a comparison between regions in the Czech Republic. Randáková and Bokšová (2015) carried out research on the structure of debtors as well and even calculated the recovery rate. The recovery rate was also determined by Paseková et al. (2015a, 2015b). The main limitations of these findings are based on questionable sample representativeness and the time of insolvency proceedings analysed. Personal bankruptcies have been allowed since 2008 in the Czech Republic. The recovery rate can only be calculated when an insolvency proceeding has been concluded. A maximum payment schedule of 60 months is foreseen by the relevant law. In the first years of the Insolvency Act, the number of proceedings was small because of uncertainty and ignorance (Kubálek et al., 2017).

Research does not need to focus solely on the structure of debtors and their microeconomic characteristics (Fišerová and Paseková, 2016). Fraisse (2017) discusses how to ensure the French household debt restructuring. It can also analyse the structure from the perspective of creditors (Bokšová et al., 2014). Creditors involved in insolvency proceedings

consist of three groups: banks and financial institutions, non-financial organizations, and individuals. Companies need to mitigate their risk connected to uncovered claims. Enterprises have to manage their unpaid receivables from the business and accounting perspective (Smrčka and Čámská, 2017a). There are different methods how to recover receivables, as described in detail by Smrčka and Čámská (2017c). Insolvency proceedings are the classic example of collective recovery.

2.   Materials and methods

This section describes the materials used, the data sample, and the methods applied to data processing and obtaining final results. The publicly available electronic insolvency register is the essential data source. The register provides documents and other relevant data about individual ongoing and within five years to completion.

2.1   Materials

The first weakness of previous findings is connected with debt relief as a new, unknown, uncertain concept. The present research has been carried out on current data and later (data collection February – August 2018) than the pioneering works, at a time period when debt relief became much more frequent, as the data demonstrates. The second weakness is based on representativeness. There are thousands of insolvency proceedings which are not summarized and their documents are not available for computer processing (more than 100,000 concluded insolvency cases). On the other hand, the documents are accessible for free via the electronic insolvency register. Unfortunately, these documents have to be processed manually. It takes approximately 30 minutes to process one insolvency case. Given the volume of the data sources (number of documents per insolvency proceeding and number of proceedings in total), this prevents the processing of a statistically significant sample. The preferred sampling procedure should ensure representativeness even on a small sample of data without attempting statistical significance.

As insolvency cases can only be retrieved on an individual basis, it is necessary to know the debtor's surname or case number. The insolvency register is not designed for the general queries. The cases can be extracted generally according to date of birth, date filling for insolvency or date of publishing the final report. These options do not allow for representativeness. This paper is based on an alternative procedure which allows to approach representativeness.

Insolvency cases were extracted according to the most frequent surnames in the Czech Republic. The Czech Statistical Office published the most common names and surnames by

regions. This research aggregated the list for all regions of the Czech Republic. The list of references contains an example source for one particular region (Czech Statistical Office, 2018). These data are based on the statistics provided by Ministry of the Interior of the Czech Republic. The cases obtained involved surnames (ordered alphabetically) such as Beneš, Benešová, Čermák, Čermáková, Černá, Černý, Doležal, Doležalová, Dvořák, Dvořáková, Fiala, Fialová, Hájek, Hájková, Horák, Horáková, Jelínek, Jelínková, Kolář, Kolářová, Krejčí, Kučera, Kučerová, Marek, Marková, Navrátil, Navrátilová, Němcová, Němec, Novák, Nováková, Novotná, Novotný, Pokorná, Pokorný, Pospíšil, Pospíšilová, Procházka, Procházková, Růžička, Růžičková, Sedláček, Sedláčková, Svoboda, Urbanová, Vaňková (note: these surnames are more frequent among women), Veselá, Veselý, Zeman, and Zemanová. The surnames were accompanied by the most frequent first names: Jan, Jana, Jiří, Eva, Hana, Petr, Pavel, Marie, and Josef.

Unfinished insolvency proceedings had to be excluded because they do not provide information for recovery rate calculation. The most frequently used documents were the final reports provided by insolvency administrators and the claims registration at the beginning of the insolvency proceedings. The final data sample consists of 151 cases involving 170 insolvency proceedings and 186 debtors. The discrepancy is caused by the existence of community property in married couples.

2.2 Methods

The above-defined documents were processed manually. It was necessary to go online, open each selected insolvency case individually and find the documents needed. First, the document listing the registered receivables and ones recognized by the insolvency administrator was needed. Second, the document containing the final report written by the insolvency administrator was found. The final report provides data about paid amounts. This data processing had to be processed manually because there is no unified template of the documents described above. The required data were recorded in an Excel spreadsheet and analysed statistically. The data items included the number of secured and unsecured creditors, the value of their individual receivables, the total sum of receivables, and the amount which was paid to creditors during the insolvency proceeding. Recovery rates were calculated as ratios whose numerator contains the amount paid and the denominator consists of the amount of claim recognized by the insolvency administrator. Different recovery rates were calculated (for secured, unsecured, and total claims). The applied statistical methods included frequency

analysis and standard descriptive statistics such as mean or median. These methods were applied to summarize the individual results describing each insolvency case separately.

3.   Results

The insolvency cases can be analysed and described from many points of view. This paper selected one aspect represented by registered claims and their recovery rate. Table 1 presents the claim structure. The insolvency proceedings are divided according to the total value of related claims and the claims are differentiated by the existence of collateral (un/secured claims).

Tab. 1: Claim structure

Value of claims per proceeding (in CZK)	Unsecured claims (151 proceedings)	Secured claims (30 proceedings)
0 – 99,999	10	3
100,000 – 249,999	26	6
250,000 – 499,999	46	3
500,000 – 999,999	44	9
1,000,000 – 2,000,000	23	7
More than 2,000,000	2	2
Mean of claims (in CZK)	564,970	847,228
Median of claims (in CZK)	418,359	755,167
Average value of one claim (in CZK)	60,762	577,656

Source: Own processing based on data extracted from Insolvency register (Ministry of Justice, 2019).

All cases (151) have unsecured claims. Contrary, secured claims were detected only for 31 cases (20%). A majority of the insolvency cases has unsecured claims of total value between CZK 250,000 and 1 million. The values connected to the secured claims are significantly higher. The mean is higher by almost 300,000 CZK and the same occurs in the case of the median (CZK 418 thousand versus 755 thousand). The secured claims tend to be higher also in terms of the average value of one particular claim.

Secured claims have one serious advantage for their holders: creditors should be repaid from sold collateral. Higher recovery rate of secured claims could be expected than in the case of unsecured claims. There are two main sources of unsecured claims repayment, namely the traditional monthly payment schedule which can be accompanied by asset monetization. Table 2 describes the full data sample analysed and presents the total value of the claims

registered and claims recovered. Recovery rate is defined as the claims recovered divided by the claims registered. Again, the groups of secured and unsecured claims are distinguished.

Tab. 2: Recovery rate – personal bankruptcies

	Claims registered (CZK million)	Claims recovered (CZK million)	Recovery rate (%)
Secured	85.31	61.42	72
Unsecured	25.42	17.46	68.7

Source: Own processing based on data extracted from Insolvency register (Ministry of Justice, 2019).

The total value of all claims connected with the 151 insolvency cases exceeds CZK 146 million. This seems as a significantly high number. The expectation that the secured claims reach a considerably higher recovery rate than unsecured ones was not fulfilled as the difference between 72% for secured claims and 68.7% for unsecured claims seems to be extremely low. As a next step, recovery rate of cases with and without secured claims were compared (presented in Figure 1 and expansion provided by Table 3 displaying ANOVA analysis). Both samples have the same mean of 0.68 and they differ in standard deviation (0.30 without and 0.23 with secured claims).

Fig. 1: Box plot graph – comparison of cases with and without secured claims
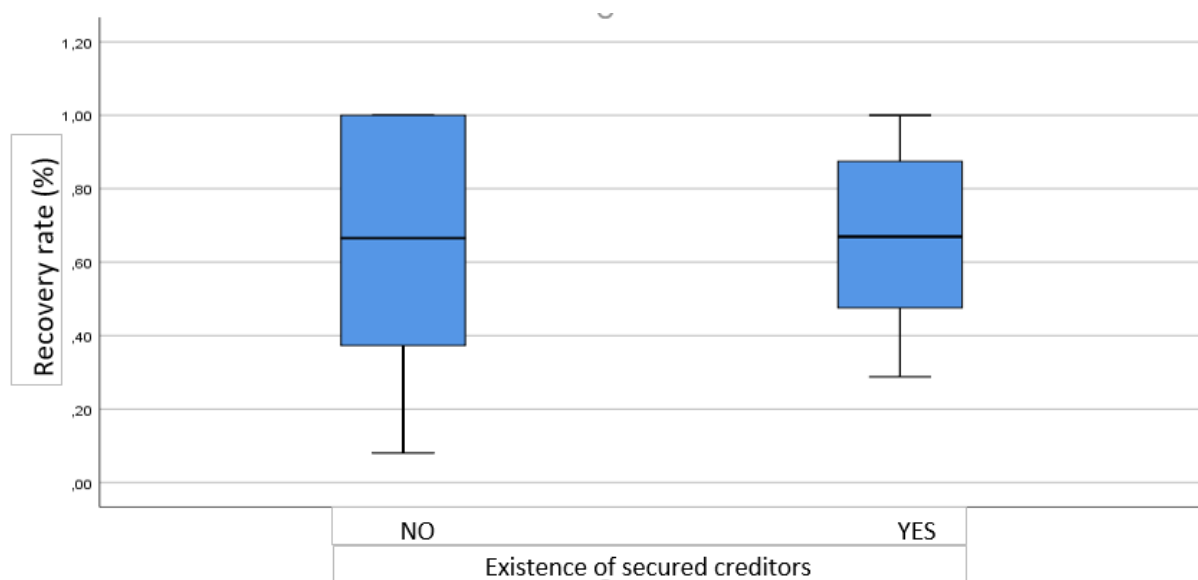
Source: Own processing based on data extracted from Insolvency register (Ministry of Justice, 2019).

Tab. 3: ANOVA analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between groups	0.0000	1	0.000	0.003	0.958
Within Groups	12.608	149	0.085		
Total	12.608	150			

Source: Own processing based on data extracted from Insolvency register (Ministry of Justice, 2019).

The existence of secured claims does not affect the mean values of recovery rate, as proved by a t-test for equality of means whose p-value equals 0 (crucial values: F 22.561; t 0.053 for equal variances assumed, t 0.062 for equal variances not assumed). Contrariwise, there is extreme variance in the cases without secured claims. Legal rules of debt relief require satisfying at least 30% of claims. Already the first quartile is higher than the minimum requirement and many cases reached full recovery. The reason will be formulated in the Discussion section.

4.   Discussion

The results obtained seem to be quite unexpected. First, there is the negligible difference between the recovery rates for secured and unsecured claims. Second, debt relief results can be compared with those describing corporate insolvency proceedings. The research topic of corporate bankruptcies is much more developed and therefore the comparable data can be gained from the literature. The recovery rates achieved for a sample of corporate insolvencies are included in Table 3.

Tab. 3: Recovery rate – corporate bankruptcies

	Claims registered (CZK million)	Claims repaid (CZK million)	Recovery rate (%)
Secured	5,077.9	1,435.8	28.2
Unsecured	23,365.3	899.3	3.8

Source: Smrčka et al. (2017b).

Secured creditors receive twice more in the case of personal bankruptcies. It shows that the market (or monetized) value of collateral assets in the case of enterprises is extremely low in comparison to the value of secured claims. The recovery rate for unsecured creditors in individual insolvency proceedings is almost 18 times higher. This represents a significant risk

of corporate defaults. Whenever possible, the creditor should prefer an individual debtor instead of an enterprise. (It must be mentioned that the absolute values of corporate credits and loans exceed the absolute values of individual debts.) The last surprising fact is that the average unsecured recovery rate for debt relief far exceeds the minimal legal requirement. Debtors are required to be able to repay at least 30% of their liabilities. It does not matter if asset monetization or repayment schedule are used. The minimum is exceeded more than twice.

Corporate defaults and personal bankruptcies seem to be two different groups whose participants have different attitudes to responsibility and to liability. Companies have mainly limited liability and therefore do not tend to repay their obligations. Individuals provide higher recovery rates because they view the repayment as their responsibility.

Conclusion

The paper highlighted the research topic of personal bankruptcies which seems still underdeveloped in the Czech Republic. The main aim was to calculate the recovery rates for secured and unsecured creditors. The recovery rate reached 72% for secured claims and 68.7% for unsecured ones. When these results are compared with each other, with the results for corporate insolvencies, or with the minimum requirement, the findings are surprising. The recovery rates obtained are high and they confirm that personal bankruptcies work appropriately on average.

The research study is limited because the number of the analysed insolvency cases is not statistically significant. First, it is impossible to process such a large data set of more than 200,000 insolvency proceedings that started in the Czech Republic since 2008. Unfinished insolvency proceedings had to be excluded because they do not allow recovery rate calculation yet. This paper worked with an original approach promising sample representativeness based on the most frequent surnames and first names. The carried-out research focused only on one characteristic of the success of the insolvency proceedings (recovery rate). Suggestions for future research are based on working with additional variables and their cross-dependencies. The potential explanatory variables include gender, education, age, region, income, type of income, or type of a creditor. The success of insolvency proceedings does not depend only on the achieved recovery rates but also on the time duration of the full insolvency proceeding. Factors could be detected which determine the success or failure of the insolvency proceedings.

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IMPROVEMENT OF R&D PERFORMANCE MANAGEMENT – A CASE STUDY APPROACH

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Abstract

Purpose: New technologies, innovations and sustainable solutions are essential for achieving companies' strategic objectives. Meanwhile, the requirements for efficient allocation of resources to knowledge, innovations and, in particular, research and development (hereinafter only "R&D") are becoming ever more demanding. The aim of this paper is to modify the Balanced Scorecard (hereinafter only "BSC") framework to improve the R&D performance management in a selected company using a case study approach.

Design/methodology/approach: Qualitative research methods consisting of a case study and semi-structured interviews were implemented in accordance with a reference framework to fulfilment the paper´s aim.

Findings: Cooperation and collaboration in the R&D networks is essential for small and medium-sized enterprises (hereinafter only "SMEs") to achieve the required financial performance. This paper suggests a BSC framework for R&D management in the case company that respects both the business character and also the strategic objectives and priorities of the selected company.

Research/practical implications: This paper is delivering recommendations how to manage R&D performance with a respect to the character of business activity and strategic objectives. This paper is also offering recommendations on managing R&D activities using the example of a SME conducting bio-economy-related R&D activities.

Originality/value: Expanding population and production create growing pressure on biological resources the consumption of which is already pressing capacity limits. With new challenges, demands on R&D management systems are ever-increasing. At company level, a current challenge for managers is to choose an adequate R&D management methods.

Keywords: research and development, performance management, Balanced Scorecard

JEL Codes: O32, M10, M20

Introduction

New technologies, innovations and sustainable solutions are essential to fulfil the goals of the European Green Deal (EU, 2019). Meanwhile, the requirements for efficient allocation of resources to knowledge, innovations and, in particular, to R&D are becoming ever more demanding (Khoshnevis & Teirlinck, 2018). With expanding population and production, there is growing pressure on the use of biological resources the consumption of which is already reaching its capacity limits. Therefore, the European Commission has updated its priorities and measures for R&D support in the bioeconomy area (EU, 2018). With new challenges, there are ever-increasing demands on R&D management systems. It is therefore a current and important task for managers to choose and implement appropriate R&D management system according to the character of R&D (basic research, experimental development etc.; including the particular type of R&D projects); the implemented R&D management system shall support a smooth coordination with all other business activities and also support implementation of strategic objectives (Chiesa et al., 2009; Khoshnevis & Teirlinck, 2018). Although a lot of studies dedicated to R&D management methods there are available (Guo, Wang & Wei, 2018; Chiesa et al., 2009; Khoshnevis & Teirlinck, 2018), there are notable issues of R&D performance management that are not sufficiently covered by the literature (Salimia & Rezaeib, 2018). The aim of this paper is to modify the Balanced Scorecard (hereinafter only "BSC") framework to improve the R&D performance management in a selected company using a case study approach.

1.   Reference framework

Chiesa et al. (2009) recognise four levels of R&D performance management; each level can be distinguished by specific management tools (see Fig. 1). If there is a need to manage R&D performance in the context of the innovation cycle level, it is recommended to use the control systems as described by Simons (1994) and by McCarthy & Gordon (2011). The tools of strategic managerial accounting are designed to R&D performance management at the market level (Tuomela, 2005; Jorgensen & Messner, 2010). BCS is one of the most sophisticated and highly recommended tools to R&D performance management at the enterprise level (Tuomela, 2005; Yawson & Sutherland, 2010). For project management the literature recommends a system of budgets and costing (Jorgensen & Messner, 2010).

Fig. 1: R&D management levels and tools used

1. Innovation cycle – Control systems
2. Market – Strategic managerial accounting
3. Enterprise – BSC
4. Project – Budgets, costing
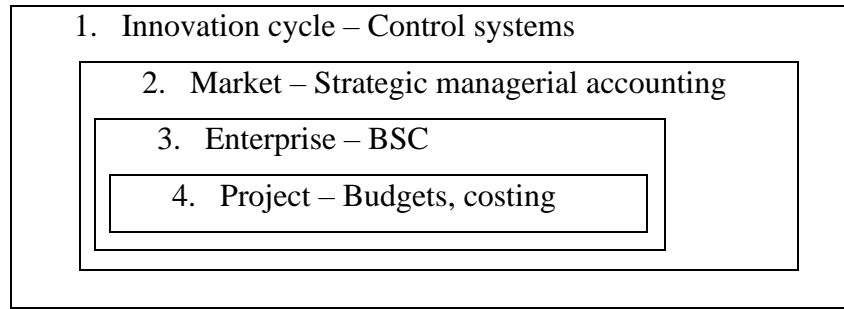
Sources: Adapted from Simons (1994), Tuomela (2005), Chiesa et al. (2009), Jorgensen & Messner (2010), Yawson & Sutherland (2010), McCarthy & Gordon (2011)

Within the scope of this paper, we direct our attention to the enterprise level. Business entities have various goals in the R&D area differing from one another also with regard to the core business of individual company. The selected methods of R&D management should take into account the character of the company's business activity, its strategic objectives and its priorities (Salimia & Rezaeib, 2018). BSC enables to monitor value generators using a balanced system of financial and non-financial indicators from the perspective of financial performance, customers, internal processes, and learning and growth (Kaplan & Norton, 2004). BSC allows managers to take into account the long-term innovation process, success in new markets, customer satisfaction and loyalty, as well as motivation and qualification growth of employees.

Salimia & Rezaeib (2018) investigated relation between the strategic objectives of an enterprise and system of R&D management in the group of SMEs. Qualitative research used by the authors in the context of investigating SMEs is recommended for research directed to innovation processes (Koners & Goffin, 2007). Qualitative methods enable to analyse the phenomena, systems and structures that are not known a priori. Case studies and structured and semi-structured interviews are important qualitative methods: case studies can show the dynamics between management systems and strategies (Jorgensen & Messner, 2010), structured and also semi-structured interviews allow creating and improving theories (Berg & Lune, 2011; Hargaden & Ryan, 2015). In line with the reference framework and paper´s aim the following research question was set: "Can BSC improve R&D management to correspond the business and strategic objectives of a particular company?"

2.   Methodology

In line with the provided reference framework qualitative research methods of case study and structured interviews are implemented to deliver the set paper´s aim. BSC is one of the most sophisticated management tool (Tuomela, 2005; Yawson & Sutherland, 2010), therefore BSC was selected as a basis for the recommendation to improve the system of R&D performance management in the case company. Hargaden & Ryan (2015) recommend semi-structured interviews when a new management system is being investigated.

To conduct the case study, we chose a SME (hereinafter referred to as the "Company") whose long-time business activity and also R&D activities are oriented to the bio-economy and bio-energy field. The Company is a member of the Czech Biogas Association. In the period from 2006 till 2013, the Company installed 95 biogas station (with the production level from 250 kW to 2 MW), most of which are agricultural biogas installations. The Company provides comprehensive services, and the services portfolio includes all areas of biogas technologies, including advisory and design, handling the EIA administration process, building a complete turnkey installation, subsequent service during operation, and biological supervision provided by its own laboratory.

The case study consisted of the following steps:

- Desk research of web pages included one – page presentations of research projects on the sub domain pages.
- Management of the company was acquainted with the aim of the research.
- Semi-structured interviews were carried out with representatives of the top management with the aim of identifying strategic objectives of the Company and the method for managing R&D activities. In total three interviews were provided, one with the owner and statutory representative, two with R&D manageress. Interviews were carried out in the month of October 2019, each interview lasted about 40 minutes. The interviews were recorded and data analysed in open coding to categorize them (as shows Tab. 1).

- Recommendations for R&D management were formulated and a BSC proposal for the area of R&D was prepared following the approach recommended by Kaplan & Norton (2004); management indicators were provided for both R&D activities and also cascaded to the individual R&D project level.

3.   Results and discussion

Strategic objectives of the Company and key approaches to R&D management resulted from the semi-structured interviews, these are summarised in Tab. 1.

Tab. 1: Priorities and methods of R&D management

Data category	Result of data analysis
Strategic objectives	• create opportunities for farmers to enter the energy sector quickly and at reasonable cost • utilize end products of primary animal and plant production, mobilize previously unexploited possibilities for resources to produce energy from biogas and support the bio-economy
R&D activities	• in-house R&D department with 7 employees; in 2018 the Company spent CZK 9 million on R&D (the Company dispose only of limited sources for R&D) • the Company has not set a specific strategy for R&D
Priorities	• evaluate the impact of R&D on financial performance of the Company; the R&D projects shall never decrease profitability of the overall business activities • evaluate the ultimate benefit (economic and technological) for the customers – the aim of R&D projects is to bring technological innovations to the customers and enable them to use their financial resources effectively (primarily through reducing operating costs); customer satisfaction is an important parameter, but the Company does not use any indicators for monitoring customer satisfaction (only communication with customers is ongoing) • assess the impact of R&D on the Company's ability to innovate and acquire new knowledge in order to strengthen customers' competitiveness and increase benefits to customers (assessing the impact of R&D on internal processes is not considered important by the Company)
Indicators used in R&D management	• Total costs of R&D • Change in number of R&D employees • Total number of projects successfully completed • Average costs to develop one product • Number of newly concluded partnerships and cooperation
R&D projects and management tools	The Company undertakes projects oriented towards development of new products and technologies. For their management, the Company uses: • Preliminary costs and revenues calculations (before starting the project) • Evaluation of budget spending • Final calculations of costs and revenues (after project is accomplished) • Evaluation of actual returns (benefits) of the project • Profit generated by R&D • Return on investment into R&D (R&D projects are tracked on individual subsidiary accounts while calculating costs and potential profits from developed products and technologies)

Source: Own research.

The following conclusions necessary to use in applying BSC emerged from the research:

- The financial performance is the most important for the Company. Based upon the implemented indicators, it seems that the Company has a very detailed overview in this

area. At project level, with one exception, there is no need to enlarge the number of monitored indicators. The exception is return on project costs. It is important for the Company to measure profitability of investments into R&D. Therefore, we recommend to do this also at project level by evaluating expected return before starting each project and upon completing it. At both times, this would be measured as revenues/costs, an indicator expressing CZK of revenues per CZK 1 spent on costs). This will enable to monitor changes of this indicator across the entire project period. If the Company will monitor profitability of individual projects and at the same time create guidance values at the level of R&D activity (for example, establishing that profitability of R&D investments should not fall below a certain %), then such indicator may be used to eliminate projects threatening the overall required profitability.

- Customers are an important stakeholder group. The Company aims to provide new technological solutions in order to reduce operation costs for the customers. The Company declares that it endeavours to boost customer satisfaction but has no tools in place to monitor the level of satisfaction. Although it is important for the Company to deliver technological solutions to its customers, the total numbers are not monitored or evaluated. We therefore suggest a new R&D management indicator *Number of new products* (or *technological solutions*) introduced to the market. Furthermore, the Company will monitor also the *speed* at which these products (or technological solutions) are launched into the market and the reactions of their customers to them (whereby the customer satisfaction also will be monitored). The core business in oriented to the bio-economy, we recommend to pay a special attention to new technical solutions that improve environmental impact of production.

- The Company considers effect of R&D to the innovation capability being important, however, the impacts of R&D on innovativeness and acquiring new knowledge are currently not monitored. We therefore recommend to monitor the development of employees and growth in their competencies at the level of R&D projects. Many of the Company's projects are carried out in partnerships with other research organizations, and the employees are in regular contact with researchers from other organizations. Solving R&D projects therefore enables also growth of employees' competencies.

- Evaluating the impact of R&D on the improvement of internal processes is not any key issue for the Company; the Company is, however, able to learn from mistakes made in project management. Therefore, we consider that it would be helpful to incorporate the indicators *Speed of introducing a new solution* and *Quality of project outcomes* into the

BSC framework under the customers' perspective and the *Employee development and their growth* under the perspective of learning and growth.

The proposed final form of BSC for management of R&D activities in the Company is shown in Tab. 2.

Tab. 2: BSC for management of R&D activities in the Company

BSC areas	R&D management indicators	Indicators for R&D project management
Financial	• Total costs of R&D • Changes in number of R&D employees • Total number of projects successfully completed • Average costs to develop one product • Profit generated by R&D activities • *Profitability of R&D investments*	• Preliminary costs and revenues calculations (before starting the project) • Evaluation of budget utilization • Final calculations of costs and revenues after project completion • Evaluation of actual returns (benefits) of the R&D project • <u>Profitability of the project (revenues/costs)</u>
Customers	• *Customer satisfaction with new products* • <u>Number of new products on the market</u> • <u>Number of environmentally improved technical solutions</u>	• Number of new products related to a specific R&D project • Speed of introduction into the market • <u>Project output quality in relation to customer satisfaction</u> • <u>Environmental improvement as a project output</u>
New knowledge and innovations	• <u>Employee development and growth in their competencies</u> • Number of new partnerships and cooperation • <u>Contributions of specific partners (across all BSC fields)</u>	• <u>Employee development and growth in their competencies</u> • Number of newly concluded partnerships and cooperation

Note: modified indicator, <u>new indicator</u>
Source: Own research.

Conclusion

The presented Company has no fully elaborated strategy. Hence it has no tools for evaluating the impact of R&D activities on the development of the Company and it faces the issue of reconciling long-term objectives of R&D projects with the objectives of the Company and linking the activities of the R&D department to other internal processes.

So far as individual areas are concerned, the most important for the Company is financial performance. Based on the information obtained, it seems that the Company has a very detailed

overview in this area and that at the project level there is no need to enlarge the number of monitored indicators. The Company regards as important to evaluate the impact of R&D on the ability of the Company to innovate and acquire new knowledge, but results in this area are neither monitored nor evaluated. Therefore, we recommend monitoring employees' development and growth in their competencies at the level of R&D projects. At the Company level, then, it is possible to link this area to the system of remuneration and employee motivation. The proposed BSC enables more accurate R&D performance management, the indicators for R&D project management reflect the character of the Company´s business. We can conclude that BSC can improve R&D management and it corresponds with the business character of the Company.

The new European strategy for the bio-economy field and the Green Deal may constitute a great opportunity for the Company. The financial instruments in preparation (especially Horizon EUROPE) can bring additional financial resources and contribute to the development of the Company. We therefore recommend also to monitor (as part of the proposed BSC) strategic partnerships and growth in employee competencies that new partners can bring and also the environmentally improved solutions. The Company falls into the category of SMEs; SMEs face shortages in disponible financial resources for R&D activities, financial managers in the SMEs are forced to reach high efficiency (Khoshnevis & Teirlink, 2018). Cooperation in partnership networks can improve financial performance of R&D activities in SMEs; however, cooperation requires a good management of R&D activities and project (Chiesa et al., 2009). BSC dispose of indicators that can support management of R&D activities on the project and also company level (Tuomela, 2005; Chiesa et al., 2009).

The main limitation of realised research is the chosen method. A case study was conducted in a selected SME, the conclusions cannot be generalized however our findings may be important for other companies to manage R&D more effectively.

The reference framework links the perspective taken in approaching the R&D management and performance evaluation with specific management tools. We have focused at the enterprise level and the level of individual R&D projects. In future research, we recommend to examine other tools that may be useful for R&D projects management primarily at the innovation cycle and market level as recommended also by McCarthy & Gordon (2011). The provided reference framework can be used as a basis for further research.

Acknowledgement

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STRATEGIC PHILANTHROPY: THE PERSPECTIVE OF CORPORATE PHILANTHROPY DRIVERS

Klára Kubíčková

Abstract

Purpose: This paper aims to provide evidence of strategic philanthropy practices in the Czech Republic through an empirical study of the drivers of corporate philanthropy and to undermine special features of corporate philanthropy in the Czech Republic.

Design/methodology/approach: The target group of Czech private companies engaged in corporate philanthropy was contacted through e-mail with a hyperlink to the online questionnaire. In total, 296 companies participated in this study. Secondary data were collected from the Albertina database, Anopress IT database and 2016-2018 annual reports. Descriptive statistics, correlations, and multiple regression analysis were used to analyze the data. The analysis was conducted for three years 2016-2018.

Findings: Slack resources and visibility were found to be statistically significant predictors of the level of corporate philanthropy in 2017. Significant differences between industries were found as well as between the company sizes. The results indicate no statistical significance of the variable age.

Research/practical implications: This article provides evidence that philanthropy in the Czech Republic is carried out with a strategic motive by finding relationships between corporate philanthropy and factors demonstrating this strategic motive. Future research might address different approaches to strategic philanthropy.

Originality/value: This paper contributes to the body of knowledge on strategic philanthropy. Although the strategic philanthropy literature is growing, the literature on philanthropic activity in post-communist economies is very scarce.

Keywords: strategic philanthropy, corporate philanthropy, Czech Republic

JEL Codes: M14

Introduction

For many years, "doing good" and "doing well" have been separate concepts (Bonini & Emerson, 2005). This means that private companies were profit-oriented entities seeking to maximize economic value, while public interest entities were non-profit organizations maximizing social or environmental value. However, modern approaches combine these concepts to "doing good by doing well." Strategic philanthropy is one of these approaches. Through engagement in strategic philanthropy, a firm achieves social benefits and at the same time addresses concerns over the wealth of shareholders (Liket & Maas, 2016).

Corporate philanthropy can be characterized as a charitable transfer of cash or other assets to a beneficiary (Godfrey, 2005). Strategic philanthropy is focused on the positive effects that philanthropy has, directly and indirectly, on both the profitability of firms and the betterment of society (Buchholtz et al., 1999; Liket and Maas, 2016). Many authors see strategic philanthropy behind the motives of corporate philanthropy, others beyond altruism. Objectives achieved through strategic philanthropy include corporate reputation improvement (Brammer & Millington, 2005), employee commitment or gaining legitimacy (Chen et al., 2008) and ultimately a positive impact on shareholder wealth (Godfrey, 2005). To investigate the possibility that corporate philanthropy is carried out strategically, the authors test the relationships between the size or level of corporate charitable contributions and the various factors that represent these strategic motives of philanthropy (Gan, 2006).

Regarding the increasing importance of strategic philanthropy, this paper aims to provide an empirical study of the determinants of corporate philanthropy in the Czech Republic and to undermine special features of corporate philanthropy in the Czech Republic. Although the strategic philanthropy literature is growing, the literature on philanthropic activity in post-communist economies is scarce. Philanthropy in these countries may differ from philanthropy in developed capitalist countries (Hanousek et al., 2010). The main reason is the difference in the tradition of corporate donation, which can affect not only the size of donations provided, the number of companies involved, but also the development of new strategies in this area. The available study that analyzed selected determinants of corporate donation in the Czech Republic (Hanousek et al., 2010) focused on the impact of the tax rate, firm size, ownership structure, industry, geographical level of operation, and location. The study showed that some determinants may influence philanthropy in the Czech Republic differently than in foreign studies. However, the influence of many determinants has not been tested, so there is still much scope for further investigation in this area.

1.   Determinants of corporate philanthropy

Probably the best-known assumption in corporate philanthropy is that large companies donate more, regardless of their profitability (Buchholtz at al., 1999; Seifert et al., 2003; Amato & Amato, 2012). The economic interpretation of the positive relationship between company size and philanthropy includes greater availability of resources (Buchholtz et al., 1999; Brammer & Millington, 2008), higher visibility (Brammer & Milligton, 2008; Marquis & Lee, 2013), greater stakeholder control (Brammer & Millington, 2008) or more sophisticated administrative processes that improves the company's ability to respond to societal challenges.

The assumption about the impact of company visibility, another frequently mentioned determinant of corporate philanthropy, is based on the motive to manage stakeholders and create more positive perception of the company (Brammer & Millington, 2005). If the media pays higher attention to the organization, the public becomes interested in its activities. This may put pressure on companies to focus more on social issues (Meznar & Nigh, 1995) and subject them to greater scrutiny (Gan, 2006). Under the condition of high public scrutiny, corporate philanthropy can play a prominent role in cultivating a positive, socially responsible image. The assumption is also based on the motive to manage legitimacy (Meznar & Nigh, 1995). Companies perceived as benefiting the society are considered legitimate and can continue in their operations. Therefore, it can be assumed that more visible companies donate more.

Research also suggests that companies donate more in the region of their headquarters and where demand is higher (usually in the capital) (Hanousek et al., 2010). The greater the number of hospitals, art organizations or educational institutions, the higher the rate of corporate donations. Based on Hanousek et al. (2010), who observed that firms located in Prague donate more than firms in other regions, this paper follows the same assumption.

Another determinant is the age of the company, which serves as a proxy for the maturity of internal organizational processes. Younger firms may donate relatively less because they may suffer from a lack of resources and capabilities or face greater economic uncertainty and instability (Burke et al., 1986). Moreover, older organizations are likely to be more integrated into existing philanthropic networks (Marquis and Lee, 2013). Burke et al. (1986) concluded that older firms exhibit a higher level of philanthropy and this research assumes the same.

Another widely accepted relationship in corporate philanthropy literature is that corporate philanthropy depends on profitability or available (slack) resources (Buchholtz et al., 1999; Seifert et al., 2003; Amato & Amato, 2012). According to the theory of slack resources, companies are involved in socially responsible activities, including corporate philanthropy,

when available resources allow this activity (Amato & Amato, 2012). However, if corporate philanthropy is carried out strategically, it should be influenced by factors other than the slack resources.

It has been also shown in various studies that corporate philanthropy differs across industries (Brammer & Millington, 2008; Hanousek et al., 2010; Amato & Amato, 2012). Research shows that firms in industries that are more dependent on public perception (Brammer & Millington, 2008), have greater public exposure and are more labour-intensive (Brammer & Millington, 2005; Gan, 2006; Amato & Amato, 2012) tend to donate more. According to these findings, this paper assumes that corporate philanthropy differs across industries.

2. Empirical approach and data

The target group consists of companies engaged in corporate philanthropy in the Czech Republic. The author compiled a list of company donors from 2016-2018 annual reports of non-profit organizations registered in the Catalogue of Czech non-profit organizations, forming a database of 4026 companies contributing to non-profit organizations. The Albertina database provided further information about companies including e-mail addresses. The target group was contacted by e-mail containing a hyperlink to the online questionnaire. In total, 296 companies participated in this study (response rate 7,4 %). Secondary data was collected using the Albertina database, Anopress IT and 2016-2018 annual reports downloaded from the Business Register. Regression analysis was used to process the data. For the categorical variables, the category with the largest shares of observations serves as the reference category.

The dependant variable corporate philanthropy appears in studies either as an absolute amount of philanthropic expenditure or its natural logarithm (e.g. Buchholtz et al., 1999; Seifert et al., 2003; Gan, 2006; Marquis & Lee, 2013) or in relative terms as a ratio of philanthropic expenditure to total revenue (e.g. Amato and Amato, 2012) or earnings before interest and taxes (EBIT) (e.g. Liket & Maas, 2016). In this paper, the measures of philanthropic expenditures to EBIT (model 1) and the natural logarithm of philanthropic expenditures (model 2) are used.

The measures of independent variable firm size include assets (Meznar & Nigh, 1995; Brammer & Millington, 2008), sales (Buchholtz et al., 1999; Hanousek et al., 2010), market capitalization (Liket & Maas, 2016) and number of employees (Meznar & Nigh, 1995; Hanousek et al., 2010). In this paper, the European Commission's User Guide to the SME definition is used to determine the size of a company (European Commission, 2015). It is based on the number of employees and the size of turnover or balance sheet as a) micro (< 10 employees, annual turnover ≤ 2 million EUR/annual balance sheet total ≤ 2 million EUR),

b) small (< 50 employees, annual turnover ≤ 10 million EUR/annual balance sheet total ≤ 10 million EUR), c medium-size (<250 employees, annual turnover ≤ 50 million EUR/annual balance sheet total ≤ 43 million EUR) and large.

Based on the studies by Meznar and Nigh (1995), Brammer and Millington (2005) and Gan (2006), the independent variable corporate visibility is measured through the number of occurrences of the company name in the media, identified by using Anopress IT.

The independent variable headquarters' location has two possible values: YES - the company is registered in the capital city of Prague, and NO - the company is not registered in the capital city of Prague.

Regarding the independent variable age, Marquis and Lee (2013) used the number of years since the company was established. In this paper, the variable has been divided into four categories according to the number of years on the market: a) <5 years, b) 5 - 10 years, c) 10 - 20 years, d) > 20 years.

For the independent variable slack resources, this paper uses the indicator of cash flow minus capital expenditure (FCFE (free cash flow to equity) - net profit after taxes plus depreciation, minus capital expenditure), based on Buchholtz et al. (1999) and Seifert et al. (2003). This measure serves as a proxy of free cash flow getting at the notion of cash flow over what is needed to fund projects (Seifert et al., 2003).

The independent variable industry is classified according to CZ-NACE and logically grouped into nine categories: trade; manufacturing; information and communication; finance; professional, scientific and technical activities; construction; health and social care; culture and recreation; other.

3.   Results

Two measures of corporate philanthropy were used – the ratio of declared philanthropic expenditure to EBIT (model 1), which is frequently used in corporate philanthropy studies, and natural logarithm of philanthropic expenditures (model 2), which avoid practical problems such as the absence of financial figures or positive profit figures (for loss-making companies). The number of cases is smaller for model 2, as many companies reported zero philanthropic contributions in some of the analyzed years.

Regarding the independent variable firm size, its values are represented as follows: micro – 24.0 %, small - 32.4 %, medium-size 23.0 % and large 20.6 %. 55.9 % of companies in the sample are headquartered outside Prague and 44.1 % in Prague. The variable age is distributed as follows: > 20 years - 57.8 %, 10 - 20 years - 28.7 %, 5 - 10 years - 8.1 % and < 5 years - 5.4 %. Representation of companies by industry categories is: trade - 19.6 %, manufacturing - 15.9 %, information and communication activities - 8.4 %, finance - 7.8 %, professional, scientific and technical activities - 18.9 %, construction - 9.1 %, health and social care - 6.8%, culture, recreation - 5.7 % and other - 7.8 %. The number of occurrences of the company name in the media is 0 – 14,518 in 2016, 0 – 13,955 in 2017 and 0 – 12,575 in 2018.

The correlation matrix shows further information about the independent variables. Especially the relationship between company size and visibility is interesting to analyze, as company size is often used as a proxy measure for visibility in corporate philanthropy studies (Meznar and Nigh, 1995, Brammer and Millington, 2008). Statistically significant correlations were found in all the analyzed years (Table 1).

Tab. 1: Correlation table: Independent variables

2016					
	Size	**Visibility**	**Headquarters**	**Age**	**FCFE**
Firm size	1.000				
Visibility	0.217** (N=244)	1.000			
Headquarters	-0.026 (N=279)	0.154* (N=244)	1.000		
Age	-0.079 (N=296)	-0.083 (N=244)	0.004 (N=279)	1.000	
FCFE	0.085 (N=240)	-0.284** (N=240)	0.082 (N=240)	0.088 (N=240)	1.000
Industry	0.028 (N=296)	0.046 (N=244)	0.043 (N=276)	0.132* (N=296)	0.001 (N=240)
2017					
	Size	**Visibility**	**Headquarters**	**Age**	**FCFE**
Firm size	1.000				
Visibility	0.212** (N=244)	1.000			
Headquarters	-0.026 (N=279)	0.161* (N=244)	1.000		
Age	-0.079 (N=296)	-0.071(N=244)	0.004 (N=279)	1.000	
FCFE	0.148* (N=234)	-0.032 (N=234)	0.018 (N=234)	0.018 (N=240)	1.000
Industry	0.028 (N=296)	0.044 (N=244)	0.043 (N=276)	0.132* (N=296)	0.034 (N=234)
2018					
	Size	**Visibility**	**Headquarters**	**Age**	**FCFE**
Firm size	1.000				
Visibility	0.232** (N=244)	1.000			
Headquarters	-0.026 (N=279)	0.154* (N=244)	1.000		
Age	-0.079 (N=296)	-0.085 (N=244)	0.004 (N=279)	1.000	
FCFE	0.222* (N=162)	0.939** (N=162)	0.007 (N=162)	-0.084 (N=162)	1.000
Industry	0.028 (N=296)	0.049 (N=244)	0.043 (N=276)	0.132* (N=296)	0.075 (N=162)

Note: * Result is significant at the level 0.05, ** result is significant at the level 0.01,

Source: Authors' calculations in IMP SPSS Statistics, version 26.

The results of the regression analysis show differences between both models and between the analyzed years (Table 2). Model 2 in the year 2016, models 1 and 2 in 2017 and model 2 in 2018 were found to be statistically significant (F-test). Variables slack resources and visibility were found to be statistically significant predictors of the level of corporate philanthropy (model 1), however only in 2017. Significant differences between industries relative to the reference category trade were found as well as between micro and small companies in 2017 (model 1). The results indicate no statistical significance of the variable age. Furthermore, the collinearity was tested. The data did not show critical tolerance levels, nor critical VIF values.

Tab. 2: Regression results: Determinants of corporate philanthropy

	2016		2017		2018	
	1	**2**	**1**	**2**	**1**	**2**
Firm size (ref. category small)						
Micro	0.000 (0.037)	-0.984 (0.500)	-2.706 (1.332)*	-0.690 (0.382)	0.624 (0.582)	-0.984 (0.500)
Middle-size	0.062 (0.034)	0.057 (0.441)	-0.333 (1.222)	0.275 (0.348)	-0.138 (0.521)	0.057 (0.441)
Large	0.005 (0.038)	0.688 (0.464)	0.183 (1.315)	0.678 (0.376)	-1.050 (0.542)	0.688 (0.464)
Visibility						
Occurrence in media	-4.245E-6 (0.000)	0.000 (0.000)	0.004 (0.000)**	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Slack resources						
FCFE	-2.580E-9 (0.000)	-2.036E-8 (0.000)	-1.128E-6 (0.000)**	7.650E-8 (0.000)	-7.018E-8 (0,000)	-2.063E-8 (0,000)
Location of headquarters						
Headquarter in capital	0.56 (0.27)*	-0.087 (0.341)	0.781 (0.941)	-0.154 (0.269)	0.429 (0.395)	-0.087 (0.341)
Age (ref. category > 20 years)						
10 - 20 years	-0.037 (0.029)	0.416 (0.348)	1.004 (1.003)	0.159 (0.285)	0.757 (0.401)	0.416 (0.348)
5 - 10 years	-0.013 (0.050)	1.257 (0.767)	2.735 (1.771)	0.054 (0.532)	-0.054 (0.845)	1.257 (0.767)
<5 years	-0.028 (0.064)	-0,381 (0.763)	2.296 (2.213)	0.042 (0.652)	0.392 (0.838)	-0.381 (0.763)
Industry (ref. category Trade)						
Manufacturing	0.44 (0.039)	0.243 (0.485)	0.264 (1,406)	0.052 (0.384)	-0.271 (0.571)	0.243 (0.485)
Information and communication activities	-0.012 (0.050)	0.399 (0.705)	-0.312 (1.797)	0.139 (0.603)	0.305 (0.710)	0.399 (0.705)
Finance	0.010 (0.056)	0.793 (0.652)	-0.705 (1.977)	0.795 (0.562)	0.419 (0.737)	0.793 (0.652)
Professional, scientific and technical activities	-0.004 (0.041)	-1.473 (0.524)*	-2.278 (1.446)	-1.193 (0.428)*	0.376 (0.593)	-1.473 (0.524)*
Construction	-0.001 (0.053)	-0.526 (0.643)	0.095 (1.872)	-0.257 (0.519)	-1.179 (0.756)	-0.526 (0.643)
Health and social care	0.006 (0.58)	-0.511 (0.736)	0.799 (1.975)	-0.371 (0.548)	0.385 (0.861)	-0.511 (0.763)
Culture, recreation	0.185 (0.062)*	1.603 (0.917)	0.733 (2.376)	2.603 (0.678)**	0.072 (0.992)	1.603 (0.917)
Other	0.015 (0.054)	0.834 (0.664)	-3.455 (1.834)	1.632 (0.511)*	-0.946 (0.744)	0.834 (0.664)
Number of cases	217	205	214	202	147	141
Constant	-0.016 (0.035)	5.056 (0.456)	ʹ0.329 (1.286)	4.999 (0.364)	-0.494 (0.541)	5.067 (0.456)
R^2	0.100	0.309	0.522	0.296	0.166	0.309
Adjusted R^2	0.022	0.211	0.480	0.231	0.056	0.211

Note: * Result is significant at the level 0.05, ** result is significant at the level 0.01, standard errors are reported in parentheses.

Source: Authors' calculations in IMP SPSS Statistics, version 26.

Conclusion

The literature on strategic philanthropy is growing. But, as stated by Gan (2006), despite the extensive descriptive literature on strategic donations, the studies have often failed to test or measure the strategic rationale behind corporate philanthropy. Some authors provided evidence that philanthropy is carried out with a strategic motive by finding relationships between corporate philanthropy and factors demonstrating this strategic motive (e.g. Gan, 2006; Amato & Amato, 2012). This article contributes to this line of strategic philanthropy research.

Corporate philanthropy is very widespread in the USA and developed Western European countries, however, it can have higher impact especially in countries where the market is not saturated with social initiatives. If Czech firms master the engagement in strategic philanthropy, they can distinguish themselves with their philanthropic programmes and gain an important competitive advantage. Although available studies confirmed the analysed factors as drivers of corporate philanthropy, the results of this study do not support all the assumptions, especially regarding the firm age and size. The results could imply that neither professionalization connected especially to larger firms and firms operating longer on the market nor the legitimacy strategy motive connected to larger firms or firms operating in "dirty" industries (Liket & Maas, 2016) may play such a key role in the Czech philanthropic programmes as it does in other countries.

However, the analysis has several limitations. There is not a register of private companies engaged in corporate philanthropy in the Czech Republic and the official data about philanthropic contributions is not available. The data on the amount of philanthropic contribution was obtained through a questionnaire survey which is not as reliable and accurate source of information as social responsibility and sustainability reports widespread in developed capitalist countries (Chen et al., 2008). Furthermore, some authors (e.g. Liket & Maas, 2016) state that even the existing research on the determinants of philanthropic expenditures does not provide empirical evidence for strategic philanthropy. They see the measurement of the impact of philanthropic activities on society and business as the signal of a firm's strategic approach to philanthropy. This line of thinking presents a wide opportunity for further research in the field of strategic philanthropy.

Acknowledgment

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LIQUIDITY GAP IN BANKRUPTCY COMPANIES IN THE CZECH REPUBLIC

Michal Kuděj – Luboš Smrčka

Abstract

Purpose: The objective of this study is to analyse liquidity gaps in bankruptcy companies and their potential as a corporate finance management tool employed to timely identify financial problems. The study responds to situations where companies and their management boards do not respond early enough to financial distress, which significantly decreases the possibility of effective remediation over time and an insolvency procedure thus becomes the only solution.

Design/methodology/approach: Our analysis is based on a sample of companies whose financial situation led to bankruptcy over one, two and three years before declaring it. The sample includes financial statements (between 2006 and 2018) of companies that later went bankrupt - a total of 982 financial statements. Each company in the sample has been checked for the occurrence of a liquidity gap and its mean & median values in the said periods. We have also analysed the relations between the liquidity gap occurred and selected financial characteristics of the sampled companies.

Findings: Most of the sampled companies had a liquidity gap already three years before declaring bankruptcy, and the situation gradually got worse as the bankruptcy approached. The average liquidity gap level is over 68%, and the occurrence of liquidity gaps above the tolerance limit is more than 78%. The sampled companies struggled with substantial liquidity gaps, i.e. they found it very difficult to pay their dues already three years before declaring bankruptcy.

Research/practical implications: The analysis has shown that the liquidity gap is a suitable financial management tool, primarily to indicate financial distress and a threat of bankruptcy where applicable. Company managers should integrate the liquidity gap concept into their sets of continuously monitored financial health indicators while also assessing the liquidity gap ex ante in making major decisions, e.g. substantial investments, distribution of profits, etc.

Originality/value: The originality of this study lies primarily in analysing a so far unexplored financial indicator that is part of the existing insolvency legislation. The key added value of the study is that it analyses an all new solvency assessment criterion that was implemented into the insolvency legislation in mid-2017, but no similar research has been done towards this end so far.

Keywords: liquidity gap, financial distress, bankruptcy, financial indicators

JEL Codes: G33, G32

Introduction

Liquidity gap is a financial criterion in assessing insolvency-based bankruptcy. Its principle lies in comparing due liabilities and cash on hand. The liquidity gap concept consists of two components, the situation/condition of the company concerned (static part) and the way such company is expected to further develop (dynamic part), i.e. an outlook of the expected near future the objective of which is to assess the company´s ability to close the liquidity gap, if any, within a very short span of time in response to the expected further development of its financial situation, based on relevant facts that have a direct impact on the company´s financial situation in the future. It is a tool that shows whether a company is in systemic insolvency or is going through a temporary deterioration of its solvency (temporary delay in payments), i.e. a kind of shock in the company´s financial management that can be overcome within a very short span of time.

One of the substantial benefits of the liquidity gap concept is its presence in the existing legislation.[4] The process of determining a liquidity gap is governed by an independent Decree of the Czech Ministry of Justice.[5] This significantly increases its importance as a financial (bankruptcy) criterion, because there is no doubt as to how it should be set up and which particular parameters are included in determining it. The power of evidence in the event of its application e.g. in order to identify factual bankruptcy is thus higher than, for example, with some ratio-based indicators in which case we might have a discussion about the types of parameters to be included in the indicator concerned.

The objective of this study is to present our liquidity gap analysis conducted in companies whose crisis reached the stage of bankruptcy and led to insolvency proceedings. The focus of this analysis is on the occurrence of liquidity gaps and their extent one, two and three years before declaring bankruptcy. Further, our analysis explores relations between the liquidity gap and other financial indicators. Therefore, the key question asked in this analysis is whether the respective management board and owners could use the liquidity gap (as one of the criteria) in deciding whether their company was endangered or in financial distress in order to take early remedial action, which, actually, is a due-care obligation that arises from the law and also bears relevance to the liability of members of corporate bodies in any business corporation facing

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[4] See Section 3, paragraph 3 of the Insolvency Act no. 182/2006 (2006)
[5] See Decree of insolvency of entrepreneurs no. 190/2017 (2017)

bankruptcy[6]; this liability, among other things, is based on the expectation that the members of such business corporation bodies knew or should have known and could have known that their corporation was facing a threat of bankruptcy and, in conflict with their due-care obligation, failed to take all necessary and reasonably expectable measures to avert that bankruptcy.

1.   Background

In terms of financial indicators, the liquidity gap can fall under the category of liquidity indicators, because it has the same basis, i.e. the proportion between a certain part of active components of working capital (cash on hand in this case) and short-term liabilities (due and overdue short-term liabilities in this case). While under the Insolvency Act to be insolvent means to have, inter alia, liabilities that are more than 30 days overdue and to fail to meet such liabilities over more than three months, the liquidity gap concept does not reflect any overdue time; on the contrary, the process of determining a liquidity gap is based on all liabilities that are currently due and overdue, and that is one of the key differences from the legal definition of insolvency.

The liquidity gap concept comes with a tolerance limit of one tenth of the difference between the volume of due liabilities and that of available funds. This converts the originally absolute indicator into a relative one that shows the proportion between the absolute liquidity gap and the due liabilities. In its relative form, the liquidity gap then makes it possible to perform inter-company comparisons as well as to identify the depth of the company´s problem. This tolerance limit is the threshold for differentiation between companies facing temporary liquidity problems (payment delays) and companies suffering from systemic insolvency. Therefore, the economic essence of the liquidity gap concept lies primarily in differentiating between systemic insolvency and a temporary delay in payments.

However, liquidity gap is not only an insolvency criterion under Section 3, paragraph 3) of the Insolvency Act where it is implemented as a "negative presumption of insolvency" which debtors can use for defence against creditors´ insolvency petitions; its factual and practical applicability is substantially more extensive. As mentioned above, one of the other possible applications is in cases of assessing the liability of statutory bodies and managers for failure to meet their obligation to avert bankruptcy and their accountability in a situation where the company managed by them actually goes bankrupt. This concept has two facets: one of

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[6] See Section 68 of the Business Corporations Act no. 90/2012 (2012)

them is based on the Business Corporations Act which tends to (in contrast with the Insolvency Act that makes the statutory body liable in the event of failure to meet their legal obligation to file an insolvency petition) avoid or prevent bankruptcy. This is based on the presumption that the members of the statutory body concerned knew or should have and could have known that their company was facing a danger of bankruptcy but, in conflict with their due-care obligation, failed to take all necessary and reasonably expectable measures in order to avert it. This involves e.g. financial distress as a potential consequence of investment decisions that might be outside the company´s financial capabilities or a decision to optimise the company´s capital structure by increasing the component of long-term third-party funding resources in a situation where the company is not able to generate enough funds to service the respective debt. As an independent scenario, a dividend payment may drain (regardless of the distributable profit) so much cash that the company is then unable to meet its liabilities. The other facet is the Insolvency Act under which any debtor is obliged to file an insolvency petition without undue delay after they learn or, with due care in place, after they should have learned about their bankruptcy. If the respective statutory body, in conflict with the aforementioned provision, fails to file such insolvency petition, it is liable to creditors for any damage that it may cause by violating this obligation. Therefore, if the company concerned had a persistent liquidity gap in the past (and if it did, it is obvious that it was not able to close it), it is self-evident that the company was systemically insolvent and that its statutory body was obliged to take measures to avert such situation or file a debtor´s insolvency petition. A persistent liquidity gap exceeding the tolerance limit is one of the facts indicating to the statutory body that the company has financial difficulties or facing a danger of bankruptcy. (Alexander, Havel, Kuděj, Louda, & Schönfeld, 2017).

So far, liquidity gap-related topics have not been covered extensively in Czech literature, because it is a new concept that was implemented into the respective legislation in mid-2017, based on a concept used in the German insolvency context where liquidity gap is part of the court practice.[7] In Czech literature, liquidity gap-relevant items only appeared recently (in 2014) in connection with the liquidity gap concept/solution proposed for the Czech context (Kuděj & Alexander, 2014; Kuděj & Louda, 2015) and then in connection with its implementation into the Czech insolvency legislation (Alexander et al., 2017; Schönfeld, 2018) or (Kuděj, Louda, & Alexander, 2015). The context of financial characteristics of companies in

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[7] BGH (Bundesgterichtshof), 24.05.2005 - IX ZR 123/04

crisis is described in some recent works (Schönfeld, Kuděj, & Smrčka, 2018, 2019). On the other hand, both local and international literature deals with business failures, warning signs of coming crises and bankruptcy prevention possibilities fairy extensively. For example, the recent reform of the Italian insolvency law included the implementation of a bad debt restructuring process aimed at improving companies´ financial health, and the success of this process depends exclusively on the timeliness of the respective intervention. Towards this end, a new scoring formula has been developed (derived from ratio indicators) for predictions of the legislation-defined state of financial emergency (De Luca & Meschieri, 2017). Recent works also include a study that deals with the impact of key financial indicators on the decision-making process in SMEs – the said key financial indicators are used as early warning signals (Pîrlog & Balint, 2016), as well as a paper whose objective is to highlight the importance of credit risk modelling for SMEs - in this connection, SMEs are divided into three categories, medium, small and micro companies, and the authors´ ambition is to show, in each of the segments, the actual prediction capabilities of several bankruptcy models, including some popular and extensively applied bankruptcy models such as Altman´s Z-score, Ohlson´s O-score, Zmijewski´s model, Taffler´s model and the IN05 model (Plíhal, Sponerová, & Sponer, 2017). Other sources analyse the impact of the company size on the likelihood of bankruptcy in the SME segment (El Kalak & Hudson, 2016), company failure processes, failure risk components (Lukason & Laitinen, 2019).

2. Data and methodology

Our analysis was conducted using a sample of 982 financial statements of bankruptcy companies (between 2006 and 2018) over a period of one/two/three years before declaring bankruptcy. The data for the analysis were obtained from the Bisnode Magnusweb database (Bisnode Česká repbulika, a.s., 2019) and further detailed based on data available in the Commercial Register Documents Collection (Czech Ministry of Justice, 2019). Data obtained from the financial statements were then used to identify/determine liquidity gaps and other financial characteristics. The characteristics of the data file generated through the said process are as follows.

Tab. 1: Financial statements of the sampled companies – by industry

	Frequency	Percent	Valid Percent	Cumulative Percent
A - Agriculture, forestry, fishing	21	2.1	2.1	2.1
B – Mining and extraction	4	0.4	0.4	2.5
C – Processing industry	304	31.0	31.0	33.5
D – Production and distribution of electricity, gas, heat and conditioned air	1	0.1	0.1	33.6
E – Supply of water, waste management	7	0.7	0.7	34.3
F – Construction industry	158	16.1	16.1	50.4
G – Wholesale and retail, maintenance and repairs of motor vehicles	239	24.3	24.3	74.7
H – Transportation and warehousing	58	5.9	5.9	80.7
I – HoReCa (hotels, restaurants, catering)	16	1.6	1.6	82.3
J – Information and communication industry	17	1.7	1.7	84.0
L – Real estate industry	51	5.2	5.2	89.2
M – Research, scientific and technological operations	67	6.8	6.8	96.0
N – Administrative and support operations	19	1.9	1.9	98.0
Q – Healthcare and social care	5	0.5	0.5	98.5
R – Culture, entertainment and recreation	3	0.3	0.3	98.8
S – Other activities/operations	12	1.2	1.2	100.0
Total	982	100.0	100.0	

Source: Authors.

Tab. 2: Financial statements of the sampled companies – by turnover

	Frequency	Percent	Valid Percent	Cumulative Percent
1. Turnover of less than CZK 5 mil.	252	25.7	25.7	25.7
2. Turnover between CZK 5 mil. and 10 mil	109	11.1	11.1	36.8
3. Turnover between CZK 10 mil. and 50 mil.	269	27.4	27.4	64.2
4. Turnover between CZK 50 mil. and 100 mil.	104	10.6	10.6	74.7
5. Turnover between CZK 100 mil. and 500 mil.	160	16.3	16.3	91.0
6. Turnover between CZK 500 mil. and 1 billion	47	4.8	4.8	95.8
7. Turnover over CZK 1 billion	41	4.2	4.2	100.0
Total	982	100.0	100.0	

Source: Authors.

On the methodological side, the liquidity gap was calculated as the difference between overdue liabilities and cash reported in the Balance Sheet, using the formula below:

$$LG = OL - C \tag{1}$$

where

LG = liquidity gap

OL = overdue liabilities

C = cash reported in the Balance Sheet

Based on (Alexander et al., 2017, p. 10)

This, in fact, is a kind of modification of the definition found in the insolvency legislation, because detailed data on the items that are subsequently used as inputs in determining the liquidity gap or, on the contrary, are excluded from such determination process, are not available. These include, primarily, unused overdraft loans or liabilities for which the respective creditors have accepted to postpone the due date. That, however, does not substantially change the relevance of the further analysis, because the said items occur fairly exceptionally, bankruptcy companies are usually reasonably expected not to have had any unused overdraft loans and creditors´ willingness to accept due date postponements without any additional requirements is usually very low.

Where the value determined through Formula (1) was positive, i.e. a liquidity gap was detected, the next step was to determine the liquidity gap rate as the proportion between the said difference and overdue liabilities, using the formula below:

$$LGR = \frac{LG}{OL} \tag{2}$$

where

LGR = liquidity gap rate

Based on (Alexander et al., 2017, p. 10)

The next step was to create a dichotomic variable to indicate whether the liquidity gap was over the tolerance limit. We therefore created such dichotomic variable for each company in the file, using which it was possible to decide whether the liquidity gap in the particular company was within tolerance or did not exist or whether the company had a liquidity gap over the tolerance limit, which then categorised the bankruptcy companies into two groups (liquidity gap within the tolerance limit or none and liquidity gap over 10%).

As the next step, we created indicators that characterise the primary operations of each company while only containing components that are really relevant to such primary operations. These indicators include, for example, primary EBITDA that only covers production and labour costs, operating EBITDA that also covers other operating costs and revenues, an indicator of primary non-cash working capital components and, predominantly, the difference between active and passive primary non-cash components of working capital which, apart from stock, only contains business receivables, business liabilities and HR cost liabilities which, more or less, corresponds with the aforesaid primary EBITDA. All of the applied indicators are then checked for polarity, i.e. whether they reach positive or negative values. This way we prepared

(for the sake of further analysis) a set of dichotomic variables to show whether or not each of the effects concerned actually occurred.

The core of the analysis is a set of descriptive statistics, primarily relative frequencies identified in contingency tables using which we analysed selected relations among the previously created dichotomic variables using line-specific relative frequencies.

The next step was an analysis of liquidity gap means and medians. The mean and median are used primarily to determine the basic liquidity gap levels which, as opposed to the frequency, show the depth of the problem. To eliminate potential faraway or extreme values, besides the standard mean we also used a 5% trimmed mean that does not contain 5% of the extreme values.

Then we analysed the relation between the occurrence of liquidity gaps, i.e. liquidity gaps over the tolerance limits, and the polarities of other selected financial characteristics. We compared two groups, one where liquidity gaps are not present or are below the tolerance limit and one where liquidity gaps are above the tolerance limit. Since the variables subjected to this comparison are dichotomic, we used non-parametric tests to compare the said groups, namely the Mann-Whitney test for assessing whether two independent groups (samples) come from the same distribution (Řezanková, 2017).

The relations between the liquidity gap and other selected financial characteristics were analysed using line-specific relative frequencies in contingency tables and also the odds ratio, a special parameter used to analyse dependencies of dichotomic variables in a four-pole table. Besides the odds ratio, the analysis also includes a confidence interval using which a dependency is identified in cases where the values of this interval do not include "1" (Řezanková, 2017).

As the last stage, we analysed liquidity gap-related and similar tools developed by other experts – known bankruptcy indicators. Like in the aforesaid analysis of the relation between the liquidity gap and selected financial characteristics, also this analysis compared two groups and the relative occurrence of liquidity gaps and other bankruptcy indicator categories.

This quantitative analysis was conducted in IBM SPSS Statistics, Version 25.

3.   Results

3.1   Liquidity gap occurrence and extent in bankruptcy companies over time

The following analysis shows the occurrence of liquidity gaps in bankruptcy companies over time on one hand, i.e. one, two and three years before declaring bankruptcy, and, on the other hand, the liquidity gap extent, i.e. the overall depth of the problem with payments of due liabilities.

Tab. 3: Liquidity gap occurrence in individual pre-bankruptcy periods

	Liquidity gap within tolerance or none	Liquidity gap of over 10%	Observations (N)
1 year before bankruptcy	13.3%	86.7%	982
2 years before bankruptcy	21.8%	78.2%	982
3 years before bankruptcy	28.8%	71.2%	982

Source: Authors.

The frequency of liquidity gaps over the tolerance limit shows that a vast majority of bankruptcy companies had a liquidity gap already three years before declaring bankruptcy, i.e. their management could have identified financial distress three years beforehand and take corrective actions to avoid going bankrupt.

Tab. 4: Liquidity gap mean and median

	1 year before bankruptcy	2 years before bankruptcy	3 years before bankruptcy	Observations (N)
Mean	0.75	0.66	0.57	982
5% trimmed mean	0.78	0.67	0.58	982
Median	0.93	0.86	0.76	982

Source: Authors.

The analysis shows that the bankruptcy companies had, on average, substantial liquidity gaps (high liquidity gap rate) in all of those three years before declaring bankruptcy, substantially above the tolerance limit of one tenth (10%) of due liabilities. The liquidity gap then grows as the bankruptcy declaration approaches, which indicates that the bankruptcy companies concerned had substantial difficulty to meet the due dates of a majority of their liabilities already three years before bankruptcy and that already three years before bankruptcy they would not have avoided declaring such bankruptcy by means of the process set forth in Section 3, paragraph 3) of the Insolvency Act. Moreover, one of the conclusions that might be drawn in connection with these companies is that they in fact *were* bankrupt three years beforehand and continued operating in a state of bankruptcy over those three years until formally declaring bankruptcy.

The mean and median analysis makes it self-evident that the liquidity gap is an important indicator of solvency problems at the sampled bankruptcy companies and that financial distress and a road to bankruptcy could have been identified in most of them already three years before they actually declared bankruptcy.

3.2 Relations between the occurrence of a liquidity gap and the polarity of selected indicators

The following analysis relates the polarity of selected indicators and the existence of a liquidity gap. As mentioned above, the term "polarity" refers to whether the financial characteristics concerned are of positive or negative values, i.e. it shows whether the company in question generates profits, losses or cash-needed deficits cash or whether its short-term liabilities as passive non-cash components of working capital are higher than the active components.

Tab. 5: Inter-group comparison – occurrence of a liquidity gap and polarities of profit generation indicators

Hypothesis Test Summary			
Null Hypothesis	**Sig.**	**Decision**	**Observations (N)**
The distribution of the added value polarity is the same across the categories of liquidity gap polarity.	0.093	Retain the null hypothesis.	982
The distribution of the primary EBITDA polarity is the same across the categories of liquidity gap polarity.	0.000	Reject the null hypothesis.	982
The distribution of the operating EBITDA polarity is the same across the categories of liquidity gap polarity.	0.000	Reject the null hypothesis.	982
The distribution of the EBITDA polarity is the same across the categories of liquidity gap polarity.	0.000	Reject the null hypothesis.	982
The distribution of the EBIT polarity is the same across the categories of liquidity gap polarity.	0.000	Reject the null hypothesis.	982

Source: Authors.

Having compared the groups by means of the Mann-Whitney test, we are rejecting, at a 5% significance level, the null hypothesis for all polarities of profit generation indicators, except for added value.

Tab. 6: Relations between the liquidity gap and the polarity of profit generation indicators

		Liquidity gap within tolerance or none	Liquidity gap of over 10%	Observations (N)
Added value polarity	Positive added value	22.4%	77.6%	982
	Negative added value	17.3%	82.7%	
Primary EBITDA polarity	Positive primary EBITDA	27.2%	72.8%	982
	Negative primary EBITDA	16.8%	83.2%	
Operating EBITDA polarity	Positive operating EBITDA	27.7%	72.3%	982
	Negative operating EBITDA	16.6%	83.4%	
EBITDA polarity	Positive EBITDA	27.8%	72.2%	982
	Negative EBITDA	16.0%	84.0%	
EBIT polarity	Positive EBIT	30.3%	69.7%	982
	Negative EBIT	15.8%	84.2%	

Source: Authors.

The analysis of relations between the liquidity gap and the polarity of profit generation indicators shows that most of the companies with polarity of profit generation indicators have a liquidity gap, regardless of the nature of this polarity. However, it is also obvious that where the selected indicators are negative, the liquidity gap is even higher. The key finding is that the liquidity gap prevails substantially even in cases where the values of these selected indicators are positive.

Tab. 7: Inter-group comparison – occurrence of a liquidity gap and working capital indicator polarities

Hypothesis Test Summary			
Null Hypothesis	**Sig.**	**Decision**	**Observations (N)**
The distribution of the cash-needed polarity is the same across the categories of liquidity gap polarity.	0.000	Reject the null hypothesis.	982
The distribution of the polarity of primary NCWC[8] balance is the same across the categories of liquidity gap polarity.	0.013	Reject the null hypothesis.	982
The distribution of the polarity of total NCWC is the same across the categories of liquidity gap polarity.	0.112	Retain the null hypothesis.	982

Source: Authors.

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[8] Non-cash components of working capital

Having compared the groups by means of the Mann-Whitney test, we are rejecting, at a 5% significance level, the null hypothesis for the cash-needed polarity and the polarity of the balance of primary non-cash components of working capital. We are not rejecting the null hypothesis for the total non-cash components of working capital.

Tab. 8: Relations between the liquidity gap and the polarity of working capital indicators

		Liquidity gap within tolerance or none	Liquidity gap of over 10%	Observations (N)
Cash-needed polarity	Cash-needed surplus	63.0%	37.0%	982
	Cash-needed deficit	7.8%	92.2%	
Polarity of the primary NCWC balance	Positive primary NCWC	23.7%	76.3%	982
	Negative primary NCWC	17.0%	83.0%	
Polarity of the total NCWC balance	Positive NCWC	24.0%	76.0%	982
	Negative NCWC	19.7%	80.3%	

Source: Authors.

The situation around the cash-needed surplus and deficit is different. This, no doubt, is a result of the cash-needed format which was set based on a requirement to be at 15%[9] of the immediate (cash) liquidity indicator. Almost all of the companies that had a cash-needed deficit had a liquidity gap above the tolerance limit, i.e. most of their short-term liabilities were overdue. The postulate for companies with a cash-needed surplus and a liquidity gap is that although their volumes of short-term liabilities were lower, most of such liabilities were overdue. The situation with primary and total non-cash components of working capital, i.e. the polarity of their balance, is similar to the situation with the polarity of profit generation indicators, i.e. most of the companies with polarity of the balance of primary and total NCWC have liquidity gaps, regardless of the nature of such polarity.

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[9] This level was selected as the minimum, taking into account that the focus of the analysis is on bankrupt companies

Tab. 9: Inter-group comparison – occurrence of a liquidity gap and the polarities of capital structure indicators

Hypothesis Test Summary			
Null Hypothesis	Sig.	Decision	Observations (N)
The distribution of the polarity of the difference between long-term capital and FA is the same across the categories of liquidity gap polarity.	0.000	Reject the null hypothesis.	982
The distribution of the equity polarity is the same across the categories of liquidity gap polarity.	0.000	Reject the null hypothesis.	982

Source: Authors.

Having compared the groups by means of the Mann-Whitney test, we are rejecting, at a 5% significance level, the null hypothesis for the polarities of capital structure indicators, i.e. the polarity of the difference between long-term capital and FA, as well as the equity polarity.

Tab. 10: Relations between the liquidity gap and the polarity of capital structure indicators

		Liquidity gap within tolerance or none	Liquidity gap of over 10%	Observations (N)
Polarity of the difference between long-term capital and FA	Positive difference between long-term capital and FA	38.3%	61.7%	982
	Negative difference between long-term capital and FA	12.2%	87.8%	
Equity polarity	Positive equity	28.0%	72.0%	982
	Negative equity	13.8%	86.2%	

Source: Authors.

The polarities of capital structure indicators also show higher associations on negative indicator levels. It is obvious that most of the companies with negative equity have liquidity gaps over the tolerance limit, just like the companies whose long-term capital is lower than their fixed assets. Nevertheless, the occurrence of a liquidity gap is also high in the companies where the values of the aforesaid indicators are positive.

3.3 Interdependences between the liquidity gap and the polarity of selected financial indicators

Tab. 11: Dependences of the liquidity gap on the polarity of profit generation indicators

	Value	95% Confidence Interval		Observations (N)
		Lower	Upper	
Odds ratio for added value polarity (positive added value/negative added value)	1.381	0.946	2.016	982
Odds ratio for primary EBITDA polarity (positive primary EBITDA / negative primary EBITDA)	1.843	1.354	2.510	982
Odds ratio for operating EBITDA polarity (positive operating EBITDA / negative operating EBITDA)	1.915	1.406	2.608	982
Odds ratio for EBITDA polarity (positive EBITDA / negative EBITDA)	2.030	1.488	2.769	982
Odds ratio for EBIT polarity (positive EBIT / negative EBIT)	2.311	1.694	3.154	982

Source: Authors.

As for profit generation indicator polarity, the odds ratio indicates some dependence across all these levels, except for the polarity of added value (where the confidence interval includes "1"). However, it should be pointed out that where the added value is negative, it is obvious that the other profit generation indicator polarities are negative, too. The highest odds ratio is that of the EBIT polarity, i.e. total pre-tax and pre-interest profit. This means that a liquidity gap identified by the management should be a signal for the management that they may be having a problem with profit generation (EBIT) as one of the root causes of deteriorated solvency.

Tab. 12: Dependences of the liquidity gap on the polarity of working capital indicators

	Value	95% Confidence Interval		Observations (N)
		Lower	Upper	
Odds ratio for cash-needed polarity (cash-needed surplus/ cash-needed deficit)	20.161	13.848	29.352	982
Odds ratio for the polarity of primary NCWC (positive primary NCWC / negative primary NCWC)	1.513	1.089	2.102	982
Odds ratio for the polarity of total NCWC (positive NCWC / negative NCWC)	1.290	0.942	1.768	982

Source: Authors.

As for working capital indicator polarity, the odds ratio indicates some dependence of the cash-needed deficit and the polarity of primary non-cash components of working capital, and the by

far highest odds ratio value is that for the cash-needed deficit, which corresponds with the previous findings regarding relations analysed by means of line-specific relative frequencies. Nevertheless, financial distress represented by the existence of a liquidity gap may also be caused by the structure of non-cash working capital components. The existence of a liquidity gap can thus be an indication for the management that there are some deficiencies and problems in terms of working capital management that can be eliminated (if identified early enough) e.g. by alternative financing of receivables, etc.

Tab. 13: Dependences of the liquidity gap on the polarity of asset and capital structure indicators

	Value	95% Confidence Interval		Observations (N)
		Lower	Upper	
Odds ratio for the polarity of the difference between long-term capital and FA (difference between long-term capital and FA / negative difference between long-term capital and FA)	4.443	3.220	6.131	982
Odds ratio for the equity polarity (positive equity / negative equity)	2.440	1.762	3.378	982

Source: Authors.

As for asset and capital structure indicator polarity, there are indications of some dependence in both cases stated above. The higher odds ratio value is that of the polarity of the difference between long-term capital and fixed assets, which makes us believe that in terms of liquidity gap, financing fixed assets by means of short-term capital poses a higher risk. The existence of a liquidity gap can thus indicate also problems in the company´s capital and asset structure. Nevertheless, measures taken in this area (e.g. changing the capital structure) tend to be of strategic nature.

3.4 Comparison: liquidity gap and other bankruptcy indicators

Compared to other bankruptcy prediction tools such as bankruptcy and solvency models, the liquidity gap is a single-factor tool. The liquidity gap concept comes with the factor of liquidity, which is a status factor, in contrast with e.g. Altman´s z-score, Kralicek´s Quick test or the Neumaiers´ IN05 Index which come with both status factors and factors independent of the instantaneous status, i.e. they reflect not only the current condition of the company concerned, but also its internal trends and performance. Basically, this means that a liquidity gap may not exist in the next period or, on the contrary, its non-existence in one particular period does not necessarily mean that the financial condition of such company is good. Its interpretation, however, is clear, and its occurrence in multiple consecutive periods (e.g. months) shows the

trend over time; a liquidity gap persistently over the tolerance limit is a serious sign of potential financial distress, or, on the contrary, a sporadic occurrence of liquidity gaps does not indicate real financial distress. Nevertheless, in terms of interpretation, a persistent liquidity gap indicates a situation where the respective company is clearly not able to duly (timely) pay its liabilities, and if other legal criteria have been met, primarily the multiplicity of creditors and the company´s inability to pay its liabilities over more than three months, the company is exposed to a substantial risk of bankruptcy (as a consequence of the creditors´ insolvency petition).

In this connection, we have compared the liquidity gap and the aforementioned bankruptcy models. As the first step, we compared the distribution within the group in which liquidity gaps are above the tolerance limit and the group in which liquidity gaps do not occur or are below the tolerance limit. Like in the previous case, we used (for the same reason) the Mann-Whitey test, and then we analysed the relative occurrence of liquidity gaps and the categories of the aforesaid bankruptcy models.

Tab. 14: Inter-group comparison – liquidity gap and synthetic indicator categories

Hypothesis Test Summary			
Null Hypothesis	**Sig.**	**Decision**	**Observations (N)**
The distribution of the Kralicek quick test category is the same across the categories of liquidity gap polarity.	0,000	Reject the null hypothesis.	982
The distribution of the Altman´s Z-score category is the same across the categories of liquidity gap polarity	0,000	Reject the null hypothesis.	982
The distribution of the Index IN05 category is the same across the categories of liquidity gap polarity.	0,000	Reject the null hypothesis.	982

Source: Authors.

Having compared the groups by means of the Mann-Whitney test, we are rejecting, at a 5% significance level, the null hypothesis for all of the analysed synthetic indicators.

Tab. 15: Liquidity gap occurrence in individual synthetic indicator categories

		Liquidity gap polarity		Observations (N)
		Liquidity gap within tolerance or none	Liquidity gap of over 10%	
Kralicek Quick Test category	3.01+ (Bankruptcy companies)	17.8%	82.2%	982
	2.00 - 3.00 (Grey zone)	41.5%	58.5%	
	<= 1.99 (Solvent companies)	48.1%	51.9%	
Altman´s Z-score category	<= 1.230 (Bankruptcy companies)	13.2%	86.8%	982
	1.231 - 2.899 (Grey zone)	25.9%	74.1%	
	2.900+ (Solvent companies)	40.6%	59.4%	
Index IN05 category	<= .900 (Bankruptcy companies)	16.6%	83.4%	982
	.901 - 1.599 (Grey zone)	27.7%	72.3%	
	1.600+ (Solvent companies)	43.5%	56.5%	

Source: Authors.

The analysis of the occurrence of liquidity gaps in the individual synthetic indicator categories has shown that more than a half of the companies that, according to the analysed synthetic indicators, are categorised as solvent companies, have liquidity gaps over the tolerance limit. Further, it has become obvious that also the companies that fall under the grey zone category have substantial liquidity gaps. The reason may be the fact that the liquidity gap concept is a single-factor criterion that reflects a specific perspective of liquidity. It is therefore likely that the other factors that are part of the synthetic indicators have outweighed the liquidity factor (that is also one of the components). Nevertheless, the key postulate in terms of declaration of bankruptcy and financial management is that if a company struggles with a persistent liquidity gap while also showing other signs of bankruptcy (see above), the risk of going bankrupt on the grounds of insolvency is high. The aforesaid prevalence of the other synthetic-indicator factors does not change this postulate, because e.g. the fact that the company concerned may be reaching satisfactory profitability levels is not relevant in terms of declaring bankruptcy under the Insolvency Act.

Conclusion

Our analysis has shown that most of the sampled bankruptcy companies had a liquidity gap already three years before declaring bankruptcy, i.e. most of these companies already had difficulty to pay liabilities by due dates three years before declaring bankruptcy. We can therefore conclude that it was already three years before declaring bankruptcy that these

companies had a problem to generate enough cash, the most likely reason being that they did not generate enough profit and did not manage their working capital appropriately. As for the liquidity gap, i.e. its occurrence and scope, it can be concluded that these companies "kept surviving" rather than lived and that it was only a matter of time before this situation became unsustainable.

We can see that liquidity gaps occurred extensively also in companies that had positive values of polarity of the selected indicators, although the occurrence of liquidity gaps was higher in cases where such polarity was negative. This makes us believe that although the companies did not generate losses, their (operating) profitability was too low to generate enough cash flow. This shows that the liquidity gap concept can be used as a suitable finance management tool.

The interdependency analysis, in particular, has shown that liquidity gaps result from insufficient operating-level performance that is mainly measured through the primary EBITDA polarity (plus the polarities of other levels which, however, are derived from this indicator). Further, we can see a substantial effect of the cash-needed polarity and the related polarity of the balance of primary NCWC. Equally relevant is the influence of the indicators of asset and capital structures – financing long-term assets by means of short-term resources, as well as (in consequence of the negative level of primary EBITDA) generating equity losses has a substantial effect in terms of liquidity gap management.

In view of the above, if the managers involved had monitored and assessed the liquidity gap, they would have inevitably arrived at a conclusion, at least three years before declaring bankruptcy, that they needed to take measures to improve the financial situation of their company while preventing a situation where they might be held liable for failure to exercise all due care. Thanks to the power of evidence of the liquidity gap concept resulting from its presence in the existing legislation, any managers thus might prove more effectively in critical situations that their company´s financial distress or bankruptcy was caused e.g. by some substantial and exceptional circumstances that they could not foresee. Although it was not until 2017 that the liquidity gap concept was implemented into the insolvency legislation, it does not change the fact that it is a liquidity and solvency criterion and that even before its implementation into the respective legislation there were enough tools available for assessing this criterion. However, in the future and, in particular, in the current situation where it is part of the insolvency legislation, the liquidity gap concept should be an important aspect and the occurrence of a liquidity gap should trigger ideas as to how to improve the financial health of the company concerned.

We can therefore conclude that the liquidity gap concept is a suitable finance management tool, a signal of potential financial distress and a trigger point for starting to think about a timely adoption of corrective actions.

One of the interesting challenges in further research might be, for example, to analyse liquidity gaps in individual industries, i.e. reflect the character of each such line of business in terms of working capital demands and the average maturity of liabilities (primarily business liabilities). Also interesting might be an analysis of companies financed by means of bank loans, because banks require companies to provide continuous financial management reports in credit financing projects, including liability age structures and liability payment summaries. Such kind of research might find out whether companies that are required to meet certain credit financing criteria perform better in terms of payment discipline. Another possible liquidity gap-related research project might be a company management analysis that monitors owner-managed companies and family businesses on one side and companies managed by professional managers on the other side, because owner-managed companies and family businesses (primarily in the SME segment) often lack appropriate controlling processes and adequately sophisticated financial management mechanisms.

Acknowledgements

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SUSTAINABLE ETHICS OF A LUXURY FASHION QUARTET – A MESSAGE IN LVHM, KERING, PRADA AND TOD´S CODES

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Abstract

Purpose: The principal reason of this paper is to explore a message expressed or implied by the Codes of Ethics or Codes of Conduct of four leading luxury fashion businesses – LVHM, Kering, Prada and Tod´s. These Codes are holistically and comparatively analyzed and their attitude to ethics and CSR is critically extracted, compared and confronted. The ultimate aim is to identify patterns of these proclamations, compare them and discuss their discrepancies.

Design/methodology/approach: Four Codes of top luxury fashion businesses are intrinsically as well as extrinsically analyzed while using content quantitative methods focusing on automatic key words frequency and content qualitative methods employing the manual Delphi approach. A particular attention is paid to the six CSR categories and to four ethical principles – the principles of personality, of solidarity, of subsidiarity and of environment protection. Via holistic and comparative Meta-Analysis, patterns are extracted, compared and confronted.

Findings: The principal message from the Codes from four leading luxury fashion businesses can be perceived as a unified endorsement of all selected ethical principles and CSR categories. However, a critical and comparative Meta-Analyses shows that these Codes have contradictions in terms, a bi-polar attitude to employees and the environment and a lack of interest for R&D.

Research/practical implications: There are serious inconsistencies regarding certain ethical principles and CSR categories. Sustainable ethics by the luxury fashion quartet have cracks and they need to be fixed before they become fatal ruptures. Further research should assess if the same applies to other businesses, and not only from the luxury fashion industry.

Originality/value: This paper is a pioneering endeavour combining economic, legal and philosophic perspectives and dealing with the dynamics of ethical and CSR proclamations by top luxury fashion businesses which are expected to be the leading force using sustainable ethics as the competitive advantage. It brings forth a brand new insight about sustainable ethics.

Keywords: code of ethics, CSR, luxury, sustainability

JEL Codes: K20, M14, Q01

Introduction

Half a century ago there emerged the concept of sustainability based on environmental, social and economic pillars and focusing on the reconciliation of available resources as an increasing world population emerged (Meadows et al., 1972). This concept of sustainability reflects the value judgments about justice in the distribution and use of resources (Marinova & Raven, 2006). The original distinction between (i) sustainability in the narrow sense, with rather systematic and visionary features and designed for soft law and self-regulation, and (ii) corporate responsibility, with rather normative and moral features and designed for national law regulation, have converged in the CSR (Bansal & Song, 2017).The United Nations ("UN") became active in this field and issued three fundamental documents: the Brundtland Report 1987; the UN Resolution 2005 and UN Agenda 2030 with it its 17 Sustainable Development Goals. These three documents are the outcome of International Law and are not per se enforceable. States have seemed to be rather slow to transfer these provisions into the mandatory parts of their national laws (MacGregor Pelikánová, 2019a).

Sustainability is a central challenge of the fashion industry (Cerchia & Piccolo, 2019) where key values and competitive advantage determinants (MacGregor Pelikánová, 2019a) are linked to their luxury brands protected as trademarks (MacGregor Pelikánová & MacGregor, 2019) and other Intellectual Property ("IP") assets (MacGregor Pelikánová, 2019c). It is about the scarcity, exclusivity and overflowing resources pointed to the top goals and priorities, such as CSR. Consequently, luxury fashion businesses need to come across as standing up for ethics and CSR and being open for cross-sector partnerships (Van Tulder et al, 2016) aiming at systemic change (Van Tulder & Keen, 2018), at least based on the expectations of their customers (Olšanová et al, 2018) and their potential investors (Morgan Stanley, 2017).

The principal reason of this paper is to explore and comparatively assess a message expressed or implied by the Codes of Ethics or Codes of Conduct ("Codes") of four leading luxury fashion businesses – LVHM, Kering, Prada and Tod´s. It will be achieved based on the literature and legislative review (1.) while using data and methods (2.) leading to the holistic, critical and comparative analysis of four Codes (3.) and implied discussion over results (4.) and conclusion.

1.   Literature and Legislative Review

Following the Kantian argument that the rightness of an action is determined by the character of the principle that a person chooses to act upon (Kant, 1785), the nature of ethical and legal principles is absolutely pivotal. Further, this focus on the nature of principles needs to be

appreciated in the light of our modern preoccupations with expression, rights, and the subjectivity of human thought which are rather assets than liabilities (Taylor, 2018). Consequently, the current drive for self-realization is not necessarily evil and destructive, instead if this drive respects key ethical principals, it can lead to the promise of our age, to the sustainable development via CSR. Indeed, CSR means the responsibility towards all stakeholders aka the entire society, including owners and investors (Cerchia & Piccolo, 2019), i.e. CSR is about the all-encompassing economic, social and environmental responsibility towards the society (Olšanová et al, 2018). The CSR consists of many types of social responsibility: economic, legal, ethical, etc. (Sroka & Szántó, 2018), i.e. it is a set of duties to adhere to in a certain manner because it is either morally or legally right or at least expected (MacGregor Pelikánová, 2019a). The CSR principles are a demonstration of moral obligations exceeding strict limits of the legal liability of the given business towards the entire society (Sroka & Lörinczy, 2015) and consequently, if a business wants to be perceived as reliable and attract employees, business partners and investors, it should (or perhaps must) demonstrate a high level of the institutionalization of sustainable and ethical principles and practices (Sroka & Szántó, 2018).

In the EU, CSR is a dialogue and interaction between businesses and their stakeholders for which the EU demands transparency via public corporate reporting of both financial and non-financial information, aka CSR reporting (MacGregor Pelikánová, 2019a), see Directive 2013/34/EU, Directive (EU) 2017/1132 and Regulation (EU) 2015/884. The general CSR evolution phases are: cultural reluctance, cultural grasp and cultural embedment (Olšanová et al, 2018), while the stakeholder theory linked to the value creation, reputation improvement and branding surpasses traditional theories which are skeptical to CSR focusing only on financial results (Olšanová et al, 2018). This is magnified by current trends of the importance of sustainability, ethics and CSR growing (Sroka & Szántó, 2018) and when Business ethics is regarded as a big factor increasingly impacting success and profits of modern businesses (Sroka & Lörinczy, 2015). Thus, society becomes much more concerned about ethics (Sroka & Szántó, 2018) and ultimately the quantity (to do any CSR or to do some reports about that), quality (what kind of CSR is done and reported), consistency and sincerity are becoming critical. Key internal stakeholders, especially top management, founders and leading shareholders influence the issuance and wording of various financial and non-financial reports as well as Codes, and this in regards to all well-established six CSR categories (MacGregor Pelikánová, 2019a).

For some European businesses, their commitment to the sustainability via CSR is a mere imposed formality and a negative burden, while for others the CSR is a vehicle for improvement

in all three spheres of the sustainability, a tool to achieve a competitive advantage and valuable information to be posted in reports (MacGregor Pelikánová, 2019b) and their internal constitutions – Codes. These Codes are products of a facultative self-regulation which has US roots going back to the Great Depression and reflecting most recent crises and scandals, such as 2002 events leading to the Sarbanes Oxley Act (Cerchia & Piccolo, 2019). They are multifunctional and might be rather general and abstract (Codes of Ethics) or more specific and practical detail oriented (Codes of Conducts). In either case, they represent and enhance a business´s culture, values, and brands (Cerchia & Piccolo, 2019) and are a tool to move from originally simplistic CSR to a truly strategic CSR. Indeed, it is established that ethical standards and even the order in which they are mentioned in Codes significantly affect business decisions and the entire business conduct (Fatemi et al, 2018). At the same, extensive empirical studies reveal that the content of Codes is still predominantly self-defensive and that Codes may lead to both positive and negative outcomes (Babri et al, 2019).

The term "luxus" means both prestigious and powerful beauty as well as an opulently extravagant display of wealth or status. The fashion luxury industry was traditionally linked to the allure of a limited access, heritage, sophistication, high desirability, excellent quality, high price and its extraordinary beauty (Olšanová et al, 2018) as well as excessive consumerism, opulence and guilty pleasures (Deloitte, 2019). However, recently, it seems that two new luxury fashion customer groups have appeared – the HENRYs (High-Earners-Not-Rich-Yet) and youngsters (Millennials and Gen Z) and these two groups are interested in ethical values and in CSR and take them into consideration when making their purchases (Deloitte, 2019). A similar interest has developed among investors while making their investment choices (Cerchia & Piccolo, 2019). Luxury fashion businesses have other reasons to develop their Codes, namely to answer already developed and published objections and criticism in re their prior failures such as inadequate labor standards, corruption and bribery matters, maltreatment of animals, pollution, etc. Since the internal constitutions of luxury fashion businesses, their Codes, are the primary source for such information, their interpretation and application are critical.

2.   Data and Methods

The data and methods used in this paper are determined by its purpose which is to explore a message expressed or implied by Codes of absolute top leading luxury fashion businesses – LVHM, Kering, Prada and Tod´s. The choice of these four businesses is obvious – they are the largest and most reputable luxury fashion businesses operating in the EU and present in the Czech Republic. Consequently, their Codes have the potential to provide a rather homogenous

message regarding the very top strata of the luxury fashion industry. Therefore, these Codes are intrinsically as well as extrinsically analyzed while using content quantitative methods focusing on automatic key words frequency and content qualitative methods employing a manual Delphi approach. Pursuant to well established recommendations and quasi-experimental methods, qualitative indicators prevail (Van Tulder et al, 2016). Particular attention is paid to the six CSR categories and to four ethical principles – the principles of personality, of solidarity, of subsidiarity and of environmental protection. Via holistic and comparative Meta-Analysis, these Codes are analyzed and their attitude to ethics and CSR is critically extracted, compared and confronted. The ultimate aim is to identify trends and patterns of these proclamations, compare them and discuss their discrepancies.

The data is obtained via a multi-disciplinary and a multi-jurisdiction research of primary and secondary data. The studied materials include legislative documents accessible from the EurLex database, academic writings accessible from the WoS and Scopus database, Codes of these businesses posted on their Internet domains and the author's own elaborated documents based on personal investigations, including interviews and mystery shopping experiences by the Authors in December, 2019. Selecting the top luxury fashion businesses was easy – the absolute top operating in the EU were included. They all have the legal form of a public limited company, aka shareholder company, and their other key features are summarized in Tab 1.

Tab. 1: Four top luxury fashion business – key features (2018)

Group	Company	Seat	Assets. (EUR bill.)	Revenue (EUR bill.)	Employ.
LVHM	LV, CD, Fendi, Bulgari	Paris, FR	128.550	46.826	145.247
Kering	Gucci, Bottega Veneta	Paris, FR	21.367	13.665	30.995
Prada	Prada	Milan, IT	4.678	3.910	12.414
Tod´s	Tod´s	St.Elpidio, IT	1.077	0.963	3.100

Source: Prepared by the authors based on data available on Domains of businesses.

The exploration and processing of such data from the Codes is done by using the text analysis aka content analysis (Kuckartz, 2014), which makes replicable and valid inferences about texts and is considered an established research method even with respect to business ethics and CSR issues (MacGregor Pelikánová, 2019b). The qualitative content analysis via a simplified Delphi method (MacGregor Pelikánová, 2019a) entails a manual ranking of data from these four Codes by three experts while focusing on four ethical principles and six CSR categories and while using (+) or (++) or (+++) and quoting. Namely, these three experts read

each and every one of these Codes and, pursuant to the Delphi method, followed the common guidelines and ranked the information as weak and general (+), moderately specific and strong (++) or very concrete and relevant (+++) and, via readjustment rounds, consolidated the resulting ranking. The quantitative content analysis is done by automatic scanning of the number of pages and frequency of key words (matching CSR categories labels – environment, employees, etc.) and again focusing on four ethical principles and six CSR categories.

The mentioned four ethical principles stream from metaphysic of morals (Kant, 1785) as adjusted to our era (Taylor, 2018) and reflect the critical importance of integrity (Fatemi et al, 2018) and the fact that CRS integrates into all activities and policy areas especially:

- the principle of personality to enhance autonomy and authenticity of the individuals;
- the principle of solidarity requires being and working together;
- the principle of subsidiarity against unreasonably distant decision-making leadership;
- the principle of the environmental protection to respect the world.

These four principles are studied separately but they do function together. In this study the mentioned ethical principles are identified, analyzed and compared in the four Codes to demonstrate that the social ethics principles are fundamental to CRS, namely to the well-established six CSR categories (MacGregor Pelikánová, 2019a):

- environment protection;
- employee matters;
- social matters and community concerns;
- respect for human rights;
- anti-corruption and bribery matters; and
- R&D activities (MacGregor Pelikánová, 2019c).

Regarding the literature and academic writing, the synthesis and teleological interpretation are employed. This holistic and comparative processing via critical Meta-Analysis reveals trends, compliance and/or discrepancies, both intrinsic (by Codes themselves) and extrinsic (Codes v. reality) and suggests who is ethical and pro-CSR and who merely appears so (Cerchia & Piccolo, 2019). Further, it brings a brand-new insight about their effectiveness, efficiency, consistency and veracity in this respect and points to critical deficiencies.

3.   Codes in the light of ethical principles and CSR categories

All four Codes look prima facia as representative and proclamatory constitutions shaped to convey appropriate information to all stakeholders. They all are freely available on the Internet domains of these businesses and reflect four ethical principles and six CSR categories, but the analysis below reveals that they are rather heterogenous and have very little in common.

3.1   Codes in the light of four ethical principles

The LVMH Code entails all four ethical principles and includes enforceable norms, rules and principles. It respects the principle of personality by respecting the individuals and their private life, appreciating responsible people with social awareness being at the heart of successful performance. It respects the principle of solidarity by promoting the culture of dialogue and enhancing a shared ethical framework that keeps together an ecosystem of common culture of excellence and creativity to satisfy the aspiration of the customers. It respects the principle of solidarity outwardly oriented by building responsible relations with partners and contributing to the corporate philanthropy. It respects the principle of subsidiarity by emphasizing „the autonomy of its Maisons, recognizing diversity of the business models" and preserving, nurturing and sharing expertise and various skills. The principle of the environmental protection is not just an imperative of the day but also a source of progress and aims at integrating the environmental dimension into their products. Talking about production, it uses the phrase „environmental performance". Winning the trust of customers is not just a matter of business but also of mutual communications and respect for the individual. It deals with building a culture of creativity, integrity, loyalty and personal responsibility, to promote not only a successful business but also to enable all involved individuals to fulfill their lives.

The Kering Code is an in-depth document which reflects in detail the principles of personality, subsidiarity and environmental protection. The hierarchical approach seems to prevail over the principle of solidarity. The Code describes in detail fundamental values (integrity, loyalty and responsibility) and particular situations in which ethics might be at risk and promotes training in ethics awareness programs. It gives consideration to the possible ethical dilemmas that cannot be predicted and regulated in advance by the rules of the Code and requires individual engagement with respect to the principles of ethics. The managers are urged to play a special role in following the Code by setting a personal example and enhancing individual responsibility of the employees. Confidentiality plays an important role in fulfilling the principle of personality among the employees as well as toward the customers and consumers. The principle of subsidiarity is represented by the encouragement of dialogue of all

committed players and the implementation of best practices to establish new business models to improve the environment protection. The principle of environment protection is covered too.

Prada's Code of Ethics includes all four mentioned principles. It even introduces a meta-ethical dimension as it declares that ethics is considered the basis of the (economic) success of the enterprise and the Code represents a fundamental component of support for the organization. However, there are at least two question marks in connection with the ethical principles. First, in 2.2, the employees and collaborators are considered precious and indispensable resources yet the principle of personality does not allow considering a person as a resource or a means to reach an end but persons must be always considered ends of every action to respect autonomy and authenticity of a person (Kant, 1785; Taylor 2018). Second, a relationship of trust is valued as important with third parties but trust is not considered in the relations among the directors and managers and even less is it considered in relations of its own employees and collaborators. Of course, the principle of personality that includes mutual trust does not necessarily diminish the dynamic of transparency of accounting and internal controls. The Code explicitly declares that the meaning of the ethics principles is not just a matter of a public proclamations but also the obligation of every employee (the principle of personality), which is properly declared in 5. Further it declares it's respect for the environment.

Tod's Group Code is characterized by a hierarchical approach of the Group Leader to the employees, collaborators, customers, and suppliers. The principles of subsidiarity and environmental protection are covered, but the principles of personality and solidarity are invisible. The Code is considered to be a supporting factor for the organizational and control model as well as an inspiring document to promote business success. The text of the Code declares that it contains the inspiring ethical principles but the particular articles of the Code are formulated in the spirit of obligation. It opens with a list of general provisions on money laundering, property protection and it mentions „respect for persons" in the next to the last position. The text does not give consideration to persons but „recognises importance to its human resources". It requires the commitment and loyalty of its employees but not of the Group Leaders. Trust is not mentioned in the context of the Leader--employee relations. The hierarchical approach is identifiable in the area of safeguarding the environment. Regarding third parties, trust is considered a necessary precondition of business success.

Tab. 2: Codes of Ethics v. 4 principles – quality (intensity)

Business	Principle of personality	Principle of solidarity	Principle of subsidiarity	Principle of the env.pr.	Partial enforceability
LVHM	+++	++	++	++	Yes, collaborative
Kering	++	+	++	+++	Hierarchical
Prada	+	++	++	+++	Yes
Tod´s	+	+	++	+++	Yes, hierarchical

Source: Prepared by the authors based on Codes available on Domains of businesses.

The LVMH Code of Conduct is typical for a collaborative mentality and great pragmatic respect of the individual on all levels. The Kering Code of Ethics deals with all four principles and develops the issues in the context of the principle of environmental protection. Prada's Code of Ethics includes both enforceable rules and inspirational principles. Tod's Code of Conduct is typical for hierarchical mentality and is mainly made of enforceable rules and orders.

3.2   Codes in the light of six CSR categories

LVHM's and Kering's Codes are rather homogenous, international and evenly address all 6 CSR categories, both by explicit statements and implied declarations. Between these 6, the strongest is the employee category, closely followed by the environment category, weakest is the R&D category. In contrast, Prada and Tod´s Codes are much more nationally oriented and refer to Italian legislation, Legislative Decree no 231 of 8 June 2001 regulating bodies' liability for unlawful administrative acts. Human rights category is missing, and among the remaining 5, the strongest is the employee category, closely followed by the environment category. The table below summarizes the processing of both quantitative aspects generated by automatic scanning (how many pages and how many times was a key word used, i.e. a CSR category label) and qualitative aspects generated by reading and manually reading based on the Delphi method.

Tab. 3: Codes v. CSR categories – frequency of key words/ quality of information

Business	Yr/pages	Environment	Employees	Social	Human Rights	Anti-Corru	R&D
LVHM	2017/32	52/++	71/+++	22/++	6/+++	22/++	2/+
Kering	2019/25	31/+++	52/++	6/++	13/++	4/++	1/+
Prada	2018/12	4/++	18/++	1/+	0/0	3/++	0/0
Tod´s	2018/24	16/++	23/++	11/++	0/0	5/++	0/++

Source: Prepared by the authors based on Codes available on Domains of businesses.

4.   Results and Discussion

These four Codes are prima facia very similar, and this especially based on quantitative criteria. Generally, they cover all or almost all four selected ethical principles and all six well established CSR categories, they are both inside and outside oriented, and they include a mixture of obligations, while some even lead to legally binding and enforceable duties. Based on the EU law, such as Unfair Commercial Practices Directive, they can even become a basis for consumers´ claims (Cerchia & Piccolo, 2019; MacGregor Pelikánová, 2019c).

A deeper study reveals an even more fragmented and colorful picture. These Codes are very different in their genuine adherence to ethical principles and the only common feature is that they all take seriously the principle of environment protection, while the principles of subsidiarity, solidarity and even personality (!) can be underplayed. However, at the same time, they all put as the top CSR category exactly the employee category and international Codes underplay the R&D category while national Codes underplay the human rights category.

This makes no sense and leads to endogenous antagonism. Logically, it seems totally not to be reconciled, the alleged preference for the CSR category "employees" with the lack of recognition of the ethical principles of personality, solidarity and subsidiarity. Even more confusing is the zealous support for environment, both on the level of ethical principles and CSR category, and basically overlooked R&D. The internal discrepancies of the messages from these four Codes, which paradoxically constitute a trend, are summarized in Table 4, below.

Tab. 4: Codes of Ethics v. CSR categories – frequency of key words/ quality of information

Business	Top ethical principle	Bottom ethical principle	Top CSR category	Bottom CSR category
LVHM	Pnp of personality	Pnp of subsidiarity	Employees	R&D
Kering	Pnp of the env.pr.	Pnp of solidarity	Employees	R&D
Prada	Pnp the of env.pr.	Pnp of personality	Employees	Hum.Rights
Tod´s	Pnp of the env.pr.	Pnp of personality	Employees	Hum.Rights

Source: Prepared by the authors based on Codes available on Domains of businesses.

This further expands prior findings about general Codes insufficiencies and shortcoming (Babri et al, 2019), clearly calls for a re-consideration and reconciliation and a move to four phases of the theory of change, i.e. initiation, planning and design, realization and sustaining (Van Tulder & Keen, 2018)

Conclusion

The principal message expressed or implied by Codes of Ethics or Codes of Conduct of leading luxury fashion businesses – LVHM, Kering, Prada and Tod´s, can be superficially and mistakenly seen as a unified endorsement of all 4 selected ethical principles and 6 CSR categories. Yet a critical and comparative Meta-Analyses shows that these Codes have contradictions in terms, especially concerning the bi-polar attitude to employees and the alleged top concern for environment and lack of interest for R&D. Arguably, the confusion regarding certain ethical principles, like the principle of personality, plus the hierarchical and formal corporate governance and management structure could lead not only to inefficiency, but even the ineffectiveness of these Codes and ultimately these businesses. Sustainable ethics by the luxury fashion quartet have cracks which need to be fixed before they become fatal ruptures. The same applies as well for other businesses, not just from the luxury fashion industry.

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ENTREPRENEURIAL MOTIVATION, ENTREPRENEURIAL INTENTION AND ENTREPRENEURIAL TRAINING: AN EMPIRICAL STUDY OF HIGHER EDUCATIONAL TECHNICAL INSTITUTES IN NORTH INDIA

Simpi Malhotra - Ravi Kiran

Abstract

Purpose: In view of increased focus on Entrepreneurial education in Higher Education Institution (HEI) there is a need to relate Entrepreneurial motivation with intention. There is also a need to examine whether entrepreneurial training mediates entrepreneurial Intention and entrepreneurial success.

Design/methodology: The study is based on primary data gathered from population of engineering Institutions of North India. Responses were sought through a structured questionnaire from 115 students from the engineering institutes of India from Jan 11, 2019 to Dec 15, 2019. For analysis Factor analysis, Regression analysis and Partial Least Square structural equation modelling (PLS-SEM) have been applied The study investigates relation among entrepreneurial motivations and entrepreneurial intention and designs a model analysing the mediating role of entrepreneurial training among entrepreneurial Intention and entrepreneurial success.

Findings: The results support that entrepreneurial motivation influences Entrepreneurial Intention and entrepreneurship Intention through training has a partial mediation effect on entrepreneurial success. The total effect of entrepreneurial Intention through Entrepreneurial Training is (1.10) is greater than the direct effect (0.212) and is significant.

Research/practical implications: The study is useful as it suggests that attitude and intention with proper training can help improve entrepreneurial success. It will help the Higher education institutions to provide training in requisite skills to assist emerging entrepreneurs to acquire the right training skills and be an integral part of the development process.

Originality: The present study highlights the relation among entrepreneurial, motivation, entrepreneurial intentions and entrepreneurial success. It also highlights that entrepreneurial intention through training promotes entrepreneurial Success.

Keywords: entrepreneurship, motivation, intention, training, success

JEL Codes: L26, O30

Introduction

Entrepreneurship plays an important role in the economic development of a nation. It is a process of discovery, evaluation & exploitation of opportunities. They entrepreneurial decisions act as a catalyst in expanding economic activities. An entrepreneur plays an important role in the development of industrial, farm and service sector.

The researches in the field of entrepreneurship are based on his behavior due to individual's inherited capabilities (trait theory) and on factors affecting the human behavior such as individual's past learning, current perceptions, and higher-level processing of thinking (social learning theory) (Hunter-Jones, 2012). The researchers expressed that entrepreneurship is evolving under special socio-economic environment.

India being a growing economy, it must be debated as to how entrepreneurship can be plugged into the education system. Entrepreneurs in underdeveloped regions are generally "imitator" in comparison to "innovative" entrepreneurs of the developed regions. This could be due to dearth of funds for research, and deficiency of skills. The motivation to innovation is governed by ability to experiment ideas for a solution. Therefore, considering entrepreneurship in underdeveloped countries, it is pertinent to relate Entrepreneurial motivation with intention. The current research on entrepreneurship in higher educational Institutions focuses on entrepreneurial motivation and Intention and further tries to examine relation of entrepreneurial intention with Entrepreneurial Success, It also examine whether entrepreneurial training mediates among entrepreneurial intention with Entrepreneurial Success.

1.   Literature Review

Rae (2007) opined that entrepreneurs learn through their social interactions in collaborative networks / communities of interest. Entrepreneurs accrue knowledge from their activities and from the conduct of others (Holcomb et al. 2009).

Schumpeter (1911) considered "entrepreneur as innovator" who helps driving economies to higher levels. The concept was also recognized by many other researchers (Gimeno et al., 1997; Mosey & Wright, 2007). An entrepreneur is always trying to rate success and failure equally before putting his efforts. A good entrepreneur conceives the idea and transforms it into a business opportunity. Opportunity for creating new business arises in the form of imprecisely defined market needs and/or unemployed resources (Kirzner, 1979). The social learning approaches cover the conditions responsible for the entrepreneurial actions. They study how entrepreneurs identify/process/develop/exploit an opportunity (Krueger & Carsrud, 1993). Entrepreneurial Learning involves outcomes achieved from experience and knowledge. It is

a dynamic process of responsiveness, reflection, relation & application (Harrison and Leitch, 2005). Entrepreneurial Education assists in acquiring communication and creative skills to foster entrepreneurial activity. Agrawal (2014) encapsulates education system in India and highlighted that central & the state governments are responsible for providing basic education. As there are various types of skill mismatch in the education imparted and job functionalities, Higher Educational Institutions play a significant part in imparting entrepreneurial education and training becomes more challenging. There is need to examine what skills are needed to promote entrepreneurship.

1.1 Entrepreneurial Skills

It is difficult to ascertain the skills essential to be a successful entrepreneur. Entrepreneurs have varied expertise in their relevant fields. The skill gaps in the Indian education system can be bridged if we inculcate these entrepreneurial skills into the students. Schumpeter, (1926) opined that successful entrepreneurs should take risks with innovative mindset. Entrepreneurs seek niche opportunities for market innovations, and aims to maximize profit or investors' yield (Wickham, 2006). Shook et al. (2003) emphasized the significance of opportunity exploitation. Entrepreneurship is the interaction of individuals with the environment to discover, evaluate and exploit opportunities. It is a process of "creative destruction" (Barringer & Bluedorn, 1999). Caglio and Katz (2001) stated that entrepreneurs identify opportunities where other people perceive risks. They are able to develop mental image of future as they are entrepreneurially alert for opportunities (Kirzner, 1979; Suomala et al., 2006). Loué & Baronet (2012) developed a new framework for entrepreneurial skills. The 44 skills identified were categorized into eight categories. These were: i) Intuition and Vision, ii) Opportunity Recognition and Exploitation, iii) Financial Management, iv) Human Resource Management, v) Marketing & Commercial Activities, vi) Leadership, vii) Self-Discipline, and, viii) Marketing & Monitoring. Entrepreneurship Intention vests in creating your own business (Moreno, Castillo, and Triguero, 2012).

Behavior of a person is guided by the motivation for specific behavior. The motivation is guided by the rewards of success over failure. It is also guided by mentor's confidence over him to perform the behavior. A person will be able to succeed if he has sufficient control over these factors (endogenic /exogenic), and influence realization of the behavioral goal (Ajzen, 1985).

Earlier literature suggests entrepreneurship behavior is predicted by entrepreneurial attitudes, subjective norms and perceived behavioural control (Li 2007; Engle et al. 2010; Pihie and Bagheri 2011). Entrepreneurial motivation helps to convert entrepreneurial intentions into

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action. Entrepreneurial motivation is significantly influenced by social valuation and entrepreneurial sustenance (Malebana, 2014).

Earlier literature on entrepreneurial success focused on only economic indicators (Walker and Brown, 2004; Gorgievski et al, 2014. Entrepreneurial success is appraised from a financial perception (Zhou et al., 2017; Sales growth Achtenhagen et al., (2010). Richard et al. (2009) related it with good position in market; Brandstätter (2011) related it with productive improvement. Kiviluoto, (2013) opined not to rely only on economic indicators. Deeper insights into entrepreneurial success suggest a need for a holistic approach (Kiviluoto, 2013). The success scale used in this study covers a holistic perspective.

Curran and Stanworth (1989), Cox (1996), and Storey (2000), recognized need for evaluating entrepreneurship training. Romer-Paakkanen and Pekkala, (2008) concluded that traits of business come from personal interest in business and their hobbies also gives them enthusiasm for decision making strategies. Herrmann et al. (2008) have argued to promote experiential learning as a teaching tool for inculcating entrepreneurial education in order to develop skills in students to tackle real world problems. Miller (2011) believes that training will help in improving the risk-taking ability and innovativeness. Seun & Kalsom, (2015) and Cheraghi and Schøtt (2015) opined that entrepreneurship training leads to enhancement of knowledge, attitude and skills and improve entrepreneurial competences. Thus, the current work is based on examining the relation among entrepreneurial motivation, intention and Entrepreneurial success. It further analyses whether entrepreneurial training mediates entrepreneurial Intention and entrepreneurial success.

Against this backdrop the present study has been undertaken with the following broad objectives:

- The study tries to find out the relation between entrepreneurial motivation and intention.
- It tries to examine whether entrepreneurial mediates between entrepreneurial intention and success. The survey is conducted on 115 students from higher engineering education institutes. The details of the survey are shown in Table 1.

Table 1: Survey Instrument

Scale	Literature Support
Entrepreneurial Attitude (towards Self-employment) **(What is your opinion about factors of being entrepreneurial)**	
For financial security.	Rietveld, Hessels, and Zwan (2014).
To provide employment.	
To take advantage of my creative talent.	
To earn a reasonable living	
To exploit opportunities in the market.	

Subjective Norm (How you peruse entrepreneurship?)	
Entrepreneurial family culture.	Holcomb et al. (2009).
To use skills learned in the university/institute.	
Follow the example of someone that I admired	
To invest personal savings	
To maintain my family	
I enjoy taking risk	
Perceived Behavioural Control (WHY?)	
To be my own boss	Barringer & Ireland (2005); Dugassa, (2012); Okpara (2007)
To realise my dream	
Increase my prestige and status.	
For my personal freedom	
To have an enjoyable life	
To challenge myself	
Good economic environment	
For my own satisfaction and growth	
Section C: Entrepreneurial Training (Requirements)	
Organizing Skills	Chatterjee & Das (2016); Smith, Schallenkamp & Eichholz (2006)
To provide training to students in the institute	
To make them capable of organizing and executing actions to become successful	
To help them control critical factors that influence success.	
To make them capable to realize their professional/academic future.	
To make them competent to develop my career successfully	
To enable them to ideate.	
Opportunity Identification Skills	
To enable them to think of products/services that could be offered in the market.	Chatterjee & Das (2016); Loué & Baronet (2012); Kettunen et al., 2013; Wang et al., (2013)
To help them know about the market needs for determined products/services.	
To help them possess ability to detect business opportunities in the market.	
To make them observe complaints about some products/services	
To enable them to think about new market opportunities.	
To help them imagine the possibility of success of products/services in the market.	
Perseverance Skills	
To assist them facing difficulties.	Tseng (2013)
To enable to employ extra effort to overcome adversaries.	
To help them face difficult situations as personal challenges.	
To help them tackle the obstacles with ease.	
Societal skills	
To enable to communicate effectively with friends	Huber et al., (2014); Lent et al. (2000); Flores, et al. (2010); Rae (2007)
To help them relate easily with other persons.	
To enable them to contact other persons.	
To help develop extroversion	
Creative Skills	
To enable them to find creative solutions to their academic/professional problems.	Chatterjee & Das (2016); Mosey and Wright (2007) Smith, Schallenkamp & Eichholz (2006); Gundry et al., 2014).
To help them think of new activities rather than routine activities.	
To help invent new things.	
To enable them to do tasks that are completely new.	
Planning Ability	
To make them ready for surprises in situations through planning.	Smith, Schallenkamp & Eichholz (2006)
To enable them to plan in advance.	
To help them prepare a detailed plan of academic/professional issues.	
To help possess clear professional/academic goals.	
Risk Taking Skills	

To enable them to rethink financial bet in projects that can bring advantages in the future	Gurol and Atsan (2005; Diochon et al. (2008)
To help them manage financial risks for potential benefits.	
To expose them to risky situations.	
To help them to develop an attitude to bear risks.	
Leadership Skills	Loué& Baronet (2012)
To enable them to influence other people's opinions.	
To enable them to convince others.	
To assist them to inspire other persons to do what they want.	
To enable them to inspire others.	
To assist in making others follow them.	
Section D: Entrepreneurial Intention	
Immediate Intention	
I am ready to do anything to be an entrepreneur	
My professional goal is to become an entrepreneur	
I have very seriously thought of starting a firm	
I shall make every effort to start and run my own firm	
I have already prepared myself to become an entrepreneur	
I have the firm intention to start a firm after completing studies	
I want to be my own boss.	
Future Intention	
I am determined to create a firm in the future	
I have very seriously thought of starting a firm in future	
I have strong intention to start a business someday	
Section E: Entrepreneurial Success	
Entrepreneurial success is identified with:	Walker and Brown, (2004); Gorgievski et al., (2014); Kiviluoto, 2013; Zhou et al. (2017); Richard et al., (2009)
the financial yield of the company	
good position in the market	
firm's growth	
increase in the number of employees	
sales growth	
increase in productivity	
stakeholder satisfaction	
public recognition	
good reputation	
fulfilment of societal needs	

The related hypotheses are:

H1: There is a relation between Entrepreneurial motivation and Intention.

H2: Entrepreneurial Training has a mediating effect on Entrepreneurial Success through Entrepreneurial Intention.

Cronbach's alpha, composite reliability (CR), average variance extracted (AVE) have been computed for checking reliability and validity. This is represented through Table 2. Reliability and validity are checked of all exogenous and endogenous variables. In the present study, internal consistency of all constructs is more than 0.070 and is acceptable. According to Hamid *et al.* (2017) $CR \leq 0.70 \& AVE \leq 0.50$. In Table 2, all variables have composite reliability (CR) and average variance extracted (AVE) beyond the acceptable level.

Figure 1: Proposed Model
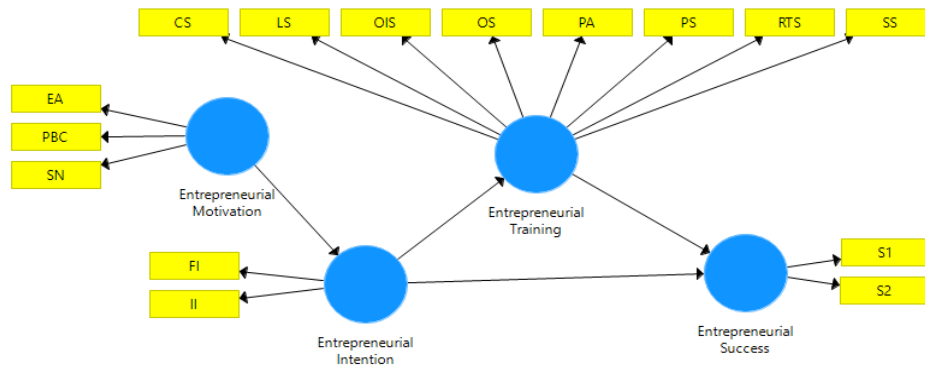
Factors for the Study	Opportunity Identification Skills (OIS)	Risk Taking Skills (RTS)
Entrepreneurial Attitude (EA)	Perseverance Skills (PS)	Leadership Skills (LS)
Subjective Norm (SN)	Societal Skills (SS)	Immediate Intention (II)
Perceived Behavioral Control (PBC)	Creative Skills (CS)	Future Intention (FI)
Organizing Skills (OS)	Planning Ability (PA)	Entrepreneurial Success (ES)

Table 2: Reliability and Validity

	Cronbach Alpha	rho_A	Composite Reliability	Average variance Extracted (AVE)
Entrepreneurial Intention	0.881	0.882	0.944	0.893
Entrepreneurial Motivation	0.702	0.718	0.799	0.571
Entrepreneurial Success	0.996	0.996	0.998	0.996
Entrepreneurial Training	0.906	0.923	0.922	0.598

In the current study criteria recommended by Fornel and Larcker (1981) has been used. The square root of average variance extracted (AVE) has been used to check the discriminant validity with a condition that $\sqrt{AVE} \geq \rho_A$.

Table 3: Discriminant Validity

	Entrepreneurial Intention	Entrepreneurial Motivation	Entrepreneurial Success	Entrepreneurial Training
Entrepreneurial Intention	0.945			
Entrepreneurial Motivation	0.569	0.756		
Entrepreneurial Success	0.446	0.628	0.998	
Entrepreneurial Training	0.287	0.444	0.874	0.893

Table 4 reports inner and outer variance inflation factor (VIF). Since none of variance inflation factor (VIF) values is greater than three, so there is no problem of multi-collinearity

in inner and outer model for males as well as females. This suggests that there is no issue of multi-collinearity.

Table 4: Variance Inflation Factor

Variable	Variance Inflation Factor (VIF)	Variable	Variance Inflation Factor (VIF)
Creative Skills (CS)	2.456	Planning Ability (PA)	1.949
Entrepreneurial Attitude (EA)	1.454	Perceived Behavioral Control (PBC)	1.358
Future Intention (FI)	2.627	Perseverance Skills (PS)	2.001
Immediate Intention (II)	2.627	Risk Taking Skills (RTS)	2.527
Leadership Skills (LS)	2.895	Subjective Norm (SN)	1.142
Opportunity Identification Skills (OIS)	2.183	Societal Skills (SS)	2.510
Organizing Skills (OS)	2.608		

Path analysis was performed using PLS-SEM. The results are shown through in Figure 2, and Table 5. The beta value of Entrepreneurial Motivation → Entrepreneurial Intention is 0.569. The *t*-value is 9.243 and $p \leq 01$. Thus, motivation is related with entrepreneurial Intention. *Thus Hypothesis H1: Entrepreneurial motivation influences Entrepreneurial Intention is supported.* The total effect of entrepreneurial Intention through Entrepreneurial Training is (0.287+0.813) is greater than direct effect (0.212) and is significant with T- values (2.432 and 23.735). *There is an evidence of partial mediation of entrepreneurial training among Entrepreneurial Intention and Entrepreneurial Success. Hence the hypothesis H2: Entrepreneurial Training mediates Entrepreneurial Intention and Entrepreneurial Success is partially supported.*

Figure 2: PLS values of various factors towards Entrepreneurial Motivation, Intention and success
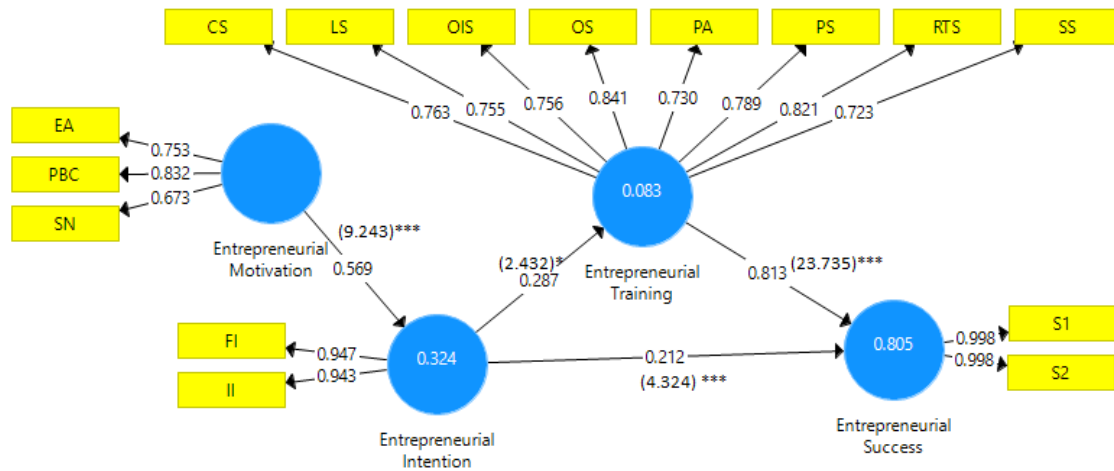
Table 5: Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Entrepreneurial Intention -> Entrepreneurial Success	0.212	0.200	0.049	4.324	0.000***
Entrepreneurial Intention -> Entrepreneurial Training	0.287	0.295	0.118	2.432	0.015*
Entrepreneurial Motivation -> Entrepreneurial Intention	0.569	0.579	0.062	9.243	0.000***
Entrepreneurial Training -> Entrepreneurial Success	0.813	0.824	0.034	23.735	0.000***
	R Square			**R Square Adjusted**	
Entrepreneurial Success	0.805			0.801	

In the present model, the value of R square is 0.805 and adjusted R-Square is 0.801. Normed fit index (NFI) is 0.875. Standardized Root Mean Square Residual (SRMR) is 0.57. The model explains 80.1% of variation in Entrepreneurship success is explained by Entrepreneurial motivation and entrepreneurial intention.

Conclusion

Entrepreneurial development is essential for economic growth. Educational Institutions can assist in stimulating entrepreunrship. Clark et al. (1984) strongly supported that entrepreneurship skills enhanced the chances of survival for new ventures. In the current study risk taking skills and organizing skills are emerging as important training skills. Right focus on these skills will enhance entrepreneurial success rate. Risk taking skills have been highlighted by Shumpeter (1926) and Wickkham (2006). The findings suggest that attitude and perceived

behavioural control are major factors influencing Entrepreneurial motivation. This has been corroborated by Shook & Bratianu, (2010) and Souitaris et al., (2007). As is indicative from results Entrepreneurial Motivation influences Entrepreneurial Intention. This is supported by (Bagozzi & Warshaw, 1990) who opined that there is an interaction between attitude towards success and expectations of success. The results further highlight Training mediates Entrepreneurial Intention and Entrepreneurial Success is empirically verified. Alam et al, (2019) has highlighted a need for entrepreneurial training for engineering students. Earlier studies on the TPB model support that the relation between entrepreneurship education and entrepreneurial intention is influenced by attitudes (Schlaegel and Koenig, 2014; Zhang et al., 2014). The current study builds up on earlier studies of Entrepreneurial motivation and intention. The current study highlights the significance of entrepreneurial training in Entrepreneurial success.

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MEASURING MARKET SELECTION IN RUSSIA: COMPARATIVE ANALYSIS OF DIFFERENT PERFORMANCE INDICATORS

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Abstract

Purpose: There is a number of indicators that may be used to measure firms' performance: productivity, revenue, profit, costs, to name just a few. On top of that, firms can compete on the market by these indicators or by a combination thereof. In this research we aim to compare some of these indicators in terms of how they proxy market selection process.

Design/methodology/approach: For the comparison, we employ data on Russian manufacturing firms for the period from 2006 to 2017. The sample contains more than 79 thousand enterprises for a period of 2 to 12 years. This research is focused on four performance indicators: labor productivity, total factor productivity (TFP), revenue per employee, and profit per employee. We compare main descriptive statistics for these indicators, their sectoral standard deviations, as well as results of the decomposition exercise for each of them.

Findings: In terms of sectoral standard deviations, total factor productivity has far lower values, compared to other indicators and the highest deviations are attributed to revenues. In the decomposition exercise, labor productivity, revenue and profit per employee produce similar results highlighting weak role of market selection forces across the industries. TFP provides the most volatile and least reliable results. We also find that firms own innovation is far more important for the aggregate performance growth than market selection.

Research/practical implications: Our work shows that more easily available indicators, such as profit or even revenue of the firm, may well substitute labor productivity indicator - when the latter is hard to obtain - in the market selection and competition research. Furthermore, we show that TFP provides less reliable results for Russian firms, which limits its applicability.

Originality/value: To our knowledge, such analysis has not been previously conducted for the Russian data and should be useful for academics specializing on competition and market selection. We also suggest that our results may be valuable to market analysts. Results of the analysis are useful for estimating performance of firms and their survival on the market.

Keywords: market selection, productivity decomposition, firm growth, competition

JEL Codes: L11, D40

Introduction

One can measure firm performance with a variety of indicators. Although each of them has their own specificity, they all used to represent how well firm performs on the market. Main goal of this research is to compare most popular performance indicators that can be used when analyzing market selection.

Choosing an appropriate indicator is an important task when measuring market success of the firm and the process of market selection. The latter postulates that the most competitive companies should increase their market shares, while least competitive – shrink and quit the markets. However, not all performance indicators are easily available and some complex indicators require a lot of information about the firms to be calculated. Therefore, it should be beneficial to understand what performance indicators are suitable for the research of the competition, what results do different indicators produce and how these results compare in case of Russian firms. In this paper, we compare labor productivity, total factor productivity, profit and revenue per employee of firms to this purpose.

For this, we employ a dataset of over 79 thousand Russian manufacturing firms for the period from 2006 to 2017. We first analyze sectoral standard deviations of different performance indicators, and then we perform widely used aggregated sectoral performance decomposition exercise to assess the market selection in Russian industries. To our knowledge, this is the first study on Russian data comparing results of the decomposition exercise for different performance indicators.

The rest of the work is organized as follows. In Section 1, we give a brief overview of recent research on market selection and performance indicators. Section 2 describes our data and methodology. In Section 3 we present and discuss our results. Section 4 concludes.

1. Background and Existing Research

The literature on industrial organization uses a number of different performance indicators for firms. The literature review by Al-Matari et al. (2014) provides a list of variables that are frequently used to represent firms' performance. According to them, the five most popular are return on assets, return on equity, return on sales, return on investment, and profit. In addition, in more recent studies on market selection, labor productivity has been frequently used.

For example, using this indicator Dosi et al. (2015) perform a decomposition exercise and measure market selection for France, Germany, the UK, and the USA. They find overall weak market selection effects with only 6-10% of aggregate productivity growth in these countries to be attributed to the market selection. Earlier work of Griliches and Regev (1995) also use

this indicator for decomposition in the case of Israeli industrial firms and find that only small portion of the aggregate labor productivity growth can be attributed to the market selection process. Same decomposition technique has been used for Russia by Savin et al. (2020). For Russian manufacturing industries market selection effect estimated by using labor productivity is also found to be weak, comparable to the estimates obtained for the EU countries and the US. Apart from that, Savin et al. (2020) have also used the total factor productivity and confirmed low role of the market section forces.

Bottazzi and Secchi (2012) for the analysis of the competition effects adopt profitability and productivity of firms. They highlight the fact that profitability-growth or productivity-growth relations are supported theoretically but find limited empirical evidence. Similar results have been also obtained by Coad (2007). It is also worth mentioning that Foster et al. (2008) find that selection is tightly connected to the profitability. Therefore, we argue that this factor is worth adding in our analysis.

Finally, if no information on costs of production is available (which is critical to estimate productivity or profitability), one could take simply the revenues per employee. Despite the obvious shortcomings we do so to test how close the results will be to the alternative performance indicators.

Generally, understanding and properly estimating performance is important for both entrepreneurship research and practice as it is closely connected to the firms' survival on the market. For example, Delmar et al. (2013) based on Swedish firm-level data find a strong positive effects of firms' profitability on their survival on the market. Dosi et al. (2017) show that productivity as a measure of performance plays key role in the survival of U.S. firms.

In the following, we proceed with the four above mentioned indicators: labor productivity, TFP, profit per employee and revenue per employee.

2. Data and Methods

For the empirical analysis we employ data on Russian manufacturing firms for the period from 2006 to 2017 (industries 10 to 32 according to NACE2 classification). Data is obtained from the Ruslana database provided by Bureau van Dijk (BvD). The sample contains more than 79 thousand enterprises for a period of 2 to 12 years. We take into account both enterprises that existed and are observed throughout the period, and enterprises that either left the market or ceased to provide information in BvD.

We also impose several limitations on the data necessary for the analysis. Namely, we only analyze firms with more than 20 employees and consider only firms that are observed for

two consecutive years. First limitation is imposed to obtain results that are comparable to ones obtained in other research for such countries as the USA, France, Germany and Russia; the second limitation is due to the fact that we need to calculate year-to-year changes for firm growth and the four performance indicators. Apart from that, we follow Brown et al. (2018) and censor our data by removing top and bottom 1% of observations in revenue growth and performance. This done since top 1% of the firms greatly differs from all other firms.

All four performance indicators we concentrate on are calculated in real prices in USD (2005 is used as a base year). Labor productivity is computed as value added divided by the number of employees, where value added is calculated as difference between revenue and total costs, excluding labor costs. As labor costs are not directly available in Ruslana database, we resort to the approximation of this indicator, calculated as a sector-region average yearly wage reported by Rosstat multiplied by the number of employees.

Profit per employee in turn is defined as a difference between company's total revenue and total costs, divided by the number of employees.

Total factor productivity (TFP), is calculated using Van Beveren (2012) approach, by estimating log-linearized Cobb-Douglas production function.

$$y_{i,t} = \beta_0 + \beta_l l_{i,t} + \beta_k k_{i,t} + e_{i,t}, \qquad (1)$$

where $y_{i,t}$ is a logarithm of firm's value added, $l_{i,t}$ is a logaritm of the number of this firm's employees and $k_{i,t}$ is real total assets of the firm i.[10] TFP capturing the technology factor as a result is:

$$\hat{\omega}_{it} = y_{i,t} - \hat{\beta}_l l_{i,t} - \hat{\beta}_k k_{i,t}, \qquad (2)$$

Finally, revenues per employee are just the revenues of firms divided by the number of their employees.

In Table 1, we present descriptive statistics for main indicators under consideration. On average Russian manufacturing firms show 1.7% revenue growth a year, which is generally in line with the Rosstat reports for the GDP growth for the considered period. Median growth is larger than the average one, suggesting considerable share of Russian firms may have negative or zero revenue growth. Estimates for the labor productivity and profit per employee are similar, both in terms of their means and medians. For all indicators, we observe a large spread of mean and median values, which suggests considerable asymmetry in the distribution of observations

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[10] Total assets is the only availible assets indicator in the Ruslana database.

of Russian firms operating on the market. To expand on this finding, we provide standard deviations for the logarithms of the performance indicators averaged over the years under consideration for each industry (Table 2).

Tab. 1: Average values of the main indicators

	Mean	Median	Std. Deviation
Revenue growth	0.017	0.089	0.707
Labor productivity	10180	3618	18670
TFP	83	51	894
Profit per employee	9971	3417	14532
Revenue per employee	66060	31925	146604

Source: Own estimations based on Ruslana data. All estimates are in USD except of revenue growth.

The results in Table 2 indicate very large differences among Russian firms active within the same industries, especially with regard to revenues per employee and less so with regard total factor productivity. Essentially, we can say that a firm one standard deviation above the mean has at least twenty four times higher performance in terms of labor productivity and thirty eight times higher performance in terms of revenues, compared to firms one standard deviation below the mean. For comparison, according to Dosi et al (2015), firms in the US and European Union typically differ in labor productivity only by factor three or four. Such differences suggest that market selection forces in Russia are not so effective since firms being so much less productive remain on the markets and coexist with the industrial leaders. Savin et al. (2019) have obtained similar results for labor productivity in the Urals Federal District.

As the next step, we employ a decomposition exercise distinguishing between two sources for the aggregate growth of the indicators on the industrial level: increase in performance indicator within the company (*within effect*) and the market share reallocation between the companies (*between effect*). The former is widely considered a proxy for innovation, since it is closely connected to the adoption and development of new technologies resulting in growing productivity, profitability and sales. The latter captures the strength of market selection, since the faster market shares are reallocated towards better performing firms, the better competition is working. Per definition, employment shares are used as an indicator of market shares in this analysis. We adapt the decomposition formula from Griliches and Regev (1995).

Tab. 2: Industrial standard deviations of the considered indicators

	Revenue growth	Labor productivity	TFP	Revenue per employee	Profit per employee
Food products	0.655	1.596	1.044	1.730	1.434
Beverages	0.755	1.706	1.192	1.893	1.665
Tobacco	0.742	1.777	1.119	1.893	1.552
Textile	0.637	1.662	1.006	1.843	1.519
Wearing apparel	0.667	1.836	1.017	2.151	1.705
Leather	0.633	1.596	0.930	1.761	1.398
Wooden products	0.819	1.749	1.215	1.977	1.662
Paper	0.560	1.527	0.891	1.700	1.327
Recorded media	0.645	1.572	0.961	2.000	1.534
Coke and refined petroleum	0.906	1.762	1.405	2.072	1.811
Chemical products	0.617	1.601	1.032	1.805	1.482
Pharmaceuticals	0.610	1.648	1.025	1.708	1.458
Rubber and plastic products	0.671	1.573	0.943	1.782	1.417
Non-metallic products	0.755	1.620	1.074	1.818	1.481
Basic metal	0.742	1.566	1.142	1.749	1.499
Fabricated metal	0.730	1.576	0.978	1.837	1.480
Computers and electronics	0.662	1.509	0.903	1.708	1.394
Electrical equipment	0.718	1.589	0.972	1.824	1.522
Machinery	0.764	1.578	0.985	1.819	1.467
Motor vehicles	0.758	1.550	1.048	1.702	1.477
Transport equipment	0.809	1.598	0.965	1.678	1.317
Furniture	0.720	1.684	1.027	1.897	1.564
Other manufacturing	0.719	1.674	1.009	1.860	1.533
Mean	**0.708**	**1.633**	**1.038**	**1.835**	**1.509**
Median	**0.719**	**1.598**	**1.017**	**1.819**	**1.482**

Source: Own estimations based on Ruslana data. All indicators are taken in logarithms.

First, we calculate the aggregate sector performance $IND_{j,t}$:

$$\widetilde{IND_{j,t}} = \sum_{i \in j} s_{i,t} ind_t, \qquad (3)$$

where $s_{i,t}$ represents firm's market share in the period t and ind_t is a one of the considered performance indicators. After that, we perform decomposition exercise on the aggregate indicator:

$$\Delta \widetilde{IND_{j,t}} = \sum_{i \in j} \overline{s_i} \Delta ind_{i,t} + \sum_{i \in j} \Delta s_{i,t} \overline{ind_i}, \qquad (4)$$

where $\bar{\cdot}$ indicates an average of the variable over two years and Δ is a first difference between two subsequent years. The first term on RHS of Eq. (4) is the within effect and the second one is the between effect. We normalize values of these two effects so that they sum up to one.

To sum up, by using the decomposition method, we can disaggregate the relative contribution of firms' internal innovation processes and market selection to the aggregate (industrial-level) performance growth.

3. Results and Discussion

We present the results for each of the four mentioned indicators in Table 3. First, we observe that in all four cases the within effect is predominant with the median value being around 0.9, i.e. performance growth through innovation processes within the companies explains around 90% of performance growth on the industry level, while market selection forces captured by the between effect – the remaining 10%.

Negative "between" values in Table 3 can be interpreted as an indicator of ineffectiveness of competition in these markets that allows firms with lower performance to increase their market share. In turn, negative "within" indicator, which is observed in very few cases, points to an overall decrease in the performance indicator within firms. For example, in the leather industry firms seem to lose both in terms of revenue and labor productivity.

Comparing the four performance indicators, we see that the median values are close for the labor productivity, profit per employee and revenue per employee. This holds true also on the level of individual industries, with only few exceptions, like leather production and the manufacturing of transport equipment. While the results for profit per employee provide slightly higher median estimate, those also exhibit high volatility captured by exceptionally high mean value. While it is likely true that firms in real world are most interested in maximizing their profits, and not just revenues or productivity, our results here do not provide a strong evidence supporting the claim that competition is better observed if we look on profits and not on productivity or revenue.

What is evident, however, is that all the three indicators are strongly (rank) correlated (see Table 4). Thus, revenue and labor productivity have an exception perfect correlation, while profits are correlated with them with a coefficient of 0.44. It implies that results obtained for these three indicators provide overall similar and consistent picture.

Tab. 3: Aggregate performance growth decomposition by NACE 2 industries

	Labor productivity		TFP		Profit		Revenue	
	Within	Between	Within	Between	Within	Between	Within	Between
Food products	0.876	0.124	0.418	0.582	0.911	0.089	0.876	0.124
Beverages	0.884	0.116	129.553	-128.553	0.892	0.108	0.884	0.116
Tobacco	0.898	0.102	0.944	0.056	0.934	0.066	0.897	0.103
Textile	0.978	0.022	-7.037	8.037	0.668	0.332	0.978	0.022
Wearing apparel	0.449	0.551	1.117	-0.117	0.559	0.441	0.443	0.557
Leather	-0.080	1.080	4.176	-3.176	0.176	0.824	-0.087	1.087
Wooden products	0.933	0.067	0.991	0.009	0.713	0.287	0.933	0.067
Paper	0.939	0.061	0.128	0.872	0.925	0.075	0.939	0.061
Recorded media	0.816	0.184	0.997	0.003	0.879	0.121	0.816	0.184
Coke and refined petroleum	0.924	0.076	1.185	-0.185	0.966	0.034	0.924	0.076
Chemical products	0.927	0.073	0.685	0.315	0.935	0.065	0.927	0.073
Pharmaceuticals	0.899	0.101	0.431	0.569	0.860	0.140	0.898	0.102
Rubber and plastic products	0.826	0.174	-1.313	2.313	0.929	0.071	0.825	0.175
Non-metallic products	0.829	0.171	1.416	-0.416	0.803	0.197	0.828	0.172
Basic metal	0.952	0.048	0.531	0.469	0.909	0.091	0.951	0.049
Fabricated metal	0.761	0.239	13.363	-12.363	0.829	0.171	0.756	0.244
Computers and electronics	1.045	-0.045	1.519	-0.519	1.015	-0.015	1.046	-0.046
Electrical equipment	0.906	0.094	2.007	-1.007	0.838	0.162	0.905	0.095
Machinery	0.677	0.323	2.441	-1.441	0.614	0.386	0.676	0.324
Motor vehicles	0.694	0.306	4.787	-3.787	0.793	0.207	0.690	0.310
Transport equipment	0.831	0.169	1.136	-0.136	-40.861	41.861	0.829	0.171
Furniture	0.809	0.191	1.804	-0.804	0.815	0.185	0.808	0.192
Other manufacturing	0.752	0.248	1.315	-0.315	0.998	0.002	0.751	0.249
Mean	**0.806**	**0.194**	**7.069**	**-6.069**	**-0.996**	**1.996**	**0.804**	**0.196**
Median	**0.876**	**0.124**	**1.136**	**-0.136**	**0.860**	**0.140**	**0.876**	**0.124**

Source: Own estimations based on Ruslana data.

Interestingly, TFP is negatively correlated with all these three aforementioned indicators. One explanation for this may be the fact that measuring TFP we only had data on total assets, without further distinction between production assets, for example (see Section 2). Our results are also in line with Savin et al. (2020) showing that labor productivity and TFP provide somewhat different ranking of industries where competitive selection is stronger.

Tab. 4: Correlations of between effects across the four considered performance indicators

	Spearman's correlation[11]			
	Labor productivity	TFP	Profit	Revenue
Labor productivity	1.000			
TFP	-0.506*** (0.01)	1.000		
Profit	0.442** (0.035)	-0.257 (0.23)	1.000	
Revenue	1.000*** (0.00)	-0.5059*** (0.01)	0.442** (0.03)	1.0000

Source: Own estimations based on Ruslana data, p-values are reported in parentheses. Asterisks ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

Examining closer the total factor productivity we see that their estimates still display dominant role of own firms' growth, but differ considerably from other three performance indicators. This may be due to several reasons. First, when estimating TFP, we could only use real total assets, not being able to distinguish in the data available between types of assets and their quality. Second, in Eq. (2) we have to assume that all firms in the industry have the same production function over the whole period of observation, which is very likely not true. Dosi and Grazzi (2006) argue that firms not only have individual production functions, but also that these functions change over time, since actual technologies in use are changing. These two reasons lead to a considerable loss of information when estimating TFP demonstrating that this measure is less suitable for market selection analysis.

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[11] We use Spearman's and not Pearson's correlation as the latter is too sensitive to outliers in our results. This is also in line with analysis performed by Dosi et al. (2015).

Conclusion

In this research, we have compared several firm performance indicators for estimating market selection forces on the industrial level. Namely, we consider labor productivity, total factor productivity, profit per employee and revenue per employee. We have compared main descriptive statistics for these indicators, their sectoral standard deviations, as well as results of their decomposition exercise. For this, we have used the data of 79 thousand Russian manufacturing firms for the period from 2006 to 2017.

The two main managerial implications of the present study are as follows. First, we provide a quantitative assessment of competitive selection forces present in Russian industries, which allows ranking them in the sense of where competition is present better or worse. Our results are concurrent to the ones obtained in the literature previously. We find weak role of market selection forces in determining the aggregate performance growth, while own productivity growth tied to the technological improvement and innovation determines around 85-90% of it (in median). This result is consistent across all the performance indicators considered but TFP.

Second, we explicitly compare the main performance indicators of firms trying to understand where their competition is better visible. We find that the labor productivity, profit per employee and revenue per employee produce comparable results in the decomposition analysis and can substitute one another if the information about companies is limited. Hence, for managers, researchers and other practitioners all these three indicators are recommended.

We also find that using TFP for the same purpose is much more problematic and should be avoided if possible. To certain extent this can be explained by data limitations, where we cannot perfectly measure productive assets of firms and their exact labor costs. What is more important though is that TFP measurement assumes similar use of production factors by all firms within each sector, which is of course an oversimplification.

Our results are informative for policy makers for example in their decisions to decide on which firms to provide public grants and subsidies to (see Dvoulety et al. 2020). If the purpose is to maintain competition or create "national champions" that export to foreign markets, one can interchangeably use the indicators we compared in our study.

Another limitation of our study worth stressing is that while industrial classification is a useful option to separate groups in classes, where they produce similar goods and compete; and this has been widely done in the literature. However, industrial classification is a very imperfect approximation of actual markets firms are competing on. In other words, firms of the same

sector may not produce goods that compete with each other (i.e. t-shirts and jeans are both produced by the firms of the 'wearing apparel' industry but cannot substitute one another). Finally, in the decomposition method company's market shares are measured through their number of employees. As a result, this approach carries the risk of missing the relationship between competitiveness and growth of firms, expressed in larger sales (associated, for example, with high level of automation of production). The latter two limitations, however, are valid for all four performance measures considered, and thus, do not affect the results of comparison.

As a prospect for further research, we would like to consider other indicators such as return on assets/equity/investment. We could not do this now because they are not available in the Ruslana database. Furthermore, we would like to examine econometrically the link between firm growth and firm performance – just as it was done in Dosi et al. (2015) and Savin et al. (2020) – with the profits per employee indicator.

Acknowledgement

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THE IMPACT OF HUMAN CAPITAL AND INSTITUTIONS ON INNOVATIONS: EVIDENCE FROM THE RUSSIAN FIRMS

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Abstract

Purpose: In this work, we aim to estimate the impact of the human capital of a company on its innovative output, in the framework of the institutional environment. We argue that efficiency of the executive power in the region not only significantly affects innovations of the companies, but also changes the way human capital affects the innovative output.

Design/methodology/approach: We base our research on the regional level data by the International Center for the Study of Institutions and Development and Business Environment and Enterprise Performance Survey for the years 2012-2014 covering 1564 Russian firms. We divide all companies based on their location into two groups: those residing in the regions with high and low efficiency of executive power. The OLS model is estimated for each group, the number of new products per employee being a dependent variable. A variety of firm level indicators as well as industry and regional dummies are used as predictors.

Findings: Results of the analysis show that the number of new products introduced by firms is greater in the regions with high efficiency of executive power than in those where efficiency of executive power is low. Our main result is that efficient executive power is essential for receiving returns to the factors important for innovations, such as human capital.

Research/practical implications: Our research helps to understand the impact of human capital on the firms' innovative output, emphasizing the role of the regional institutional environment. The results provide an insight into conditions defining capability of human capital to perform innovative activities, therefore they could be valuable for policy makers.

Originality/value: To our knowledge there has not been any previous research combining data of International Center for the Study of Institutions and Development (Higher School of Economics) and BEEPS for the Russian firms. We also employ an original econometric model that has not been used previously.

Keywords: innovations, institutions, human capital, firms, economic policy

JEL Codes: O31, O32, O38

Introduction

Introducing new products is extremely important for companies on the competitive markets. Meanwhile, innovations depend on the firm level factors including human capital and on the external factors, including institutions. Therefore, the impact both of firms' internal characteristics and the environment they operate in are important to understand. In this work, we aim to estimate the effect of the human capital of a company on its innovative output, taking into account the role of the institutional environment.

Government plays an important role in innovative activity of firms. While innovations are created mainly on a company level, governments can stimulate innovation intensity by developing environment favorable for implementation and commercialization of inventions. We consider one of the aspects of regional institutional environment, efficiency of executive power. This is an integral indicator containing efficiency indexes (ranks) covering various spheres, including public spending, and fields of activity of executive authorities – from healthcare to construction.

Our hypothesis is that the efficiency of the executive power in a region not only significantly affects companies' innovations, but also defines the impact of human capital and possibly of the other factors on innovations. Indeed, in case of human capital, having limited time, professionals share it between productive and innovative processes on one hand, and dealing with rules and procedures associated with the institutional environment where they work on the other hand.

To test this hypothesis empirically we employ data from Business Enterprise Performance Survey (BEEPS) for the period from 2012 to 2014. The econometric model is estimated for two groups of regions – those with high and low efficiency of the executive power. These groups are formed using the database on economic and political indicators for the Russian regions created by ICSID (International Center for the Study of Institutions and Development, Higher School of Economics, Moscow). The dependent variable is the number of new or significantly improved introduced products per employee of a firm and explanatory variables are a variety of firm level indicators, industry and regional dummies.

The results show that firms operating in the regions with high efficiency of the executive power receive relatively greater returns to innovation factors, such as human capital. Results of this research could be valuable for the policy makers, providing an insight into the reasons why human capital may have better opportunities to contribute to innovations in some regions than

in the others. Besides, the results could be useful for individual firms suggesting an argument for choosing one location over another.

The rest of the paper is structured as follows. In the next section, a brief review of research on firms' innovative activities is provided. Following section is devoted to description of data and methodology. Then we present and discuss the results of econometric analysis. The last section concludes and discusses possible policy implications.

1.　　Background and the Existing Research

While covering the existing literature, we aim to analyze the factors affecting performance of firms, to define the role of innovations in firms' performance, to analyze the factors important for innovations and to see how their impact varies under different circumstances. Therefore, we cover papers on innovations, R&D spending, human capital and institutional factors.

The role of human capital and institutions in economic development is well researched (Acemoglu et al., 2014). For various countries the link between institutions and economic development has been established (Easterly, 2008). The same time, innovations are known to be a key for economic development of the nations (Romer, 2018). Educational level in the region is found to generate positive spillovers in terms of increase in wages for individuals with all levels of education, as well as increase in firms' revenue in the region (Moretti, 2004; Muravyev, 2008). Based on data for 2000-2016, Akindinova et al. (2017) come to the conclusion that human capital is among the key factors in possible scenarios of economic growth in Russia.

The nature of technological change and its role in economic growth has received considerable attention of prominent researchers (Schumpeter, 1934; Solow, 1957; Romer, 1990). The link between R&D spending, human capital, and innovation output were described in the *knowledge production function* (KPF). The KPF was first developed by Paul Romer, Zvi Griliches, and Adam Jaffe in the late 1980s.

According to Romer (1986), new knowledge is produced by employing human capital and the existing stock of knowledge (Zemtsov et al., 2017). The impact of human capital on innovations has also been addressed by researchers (review: Carlino and Kerr, 2015). Diebolt and Hippe (2019) based on data for the 19th and 20th century find that regional human capital is the main factor behind current regional disparities in innovation and economic development. We are interested to study the mechanism connecting these factors. In other words, we are interested in the role of institutional environment in realizing the potential of human capital for innovation.

Interconnection between R&D and innovations, and further, the impact of innovations on productivity is currently a subject of numerous papers. Empirical research tends to show positive impact of R&D spending and innovations on productivity at least in the long run (Cirera, 2015), emphasizing the importance of studying the determinants of innovations. As for research based on the Russian data, Zhukov et al. (2017) assess the impact of regional innovations on productivity of the Russian enterprises and find that an increase in the use of advanced production technologies in a region positively affects the firms' revenues. In addition, previous research suggests that firm level innovation can be affected by the external factors (Davidson et al., 2018). State support in providing more accessible financing through subsidies is found to be important for long-term innovative development (Dvouletý and Blažková, 2019).

Bozic and Botric (2011) define factors behind propensity of firms to innovate based on data on transition countries from BEEPS for the year 2009 and find that subsidies, pressure from consumers and foreign competitors, political instability, tax rates and inadequate education of employees affect firms' propensity to innovate. Firm's size and country level factors are found to be important as well. Hanousek and Kochanova (2016) examine the relation between bureaucratic corruption and firm performance in CEE countries and conclude that higher mean bribery results in lower performance, while higher dispersion of individual firm bribes facilitates firm performance.

Zemtsov et al. (2017) perform a regional level analysis of innovations in Russia. They claim that spending on innovation increased annually in the 2000s in the Russia's regions; however, regions differ substantially in terms of innovation outcomes. Zemtsov et al. find that the quality of human capital associated with the number of economically active urban citizens with a higher education has the greatest impact on the number of patents. The authors also find that buying equipment and spending on basic research is important for innovations.

Researchers analyzing the Russian history and modern economic situation tend to conclude that further economic growth will depend on development of institutions (Yasin, 2014; Gurvich, 2017). Based on the analysis of historical background of Russia's institutions Auzan (2017) emphasizes the importance of changes in informal institutions and social contract for economic development.

From the papers considered above we see that it is important to understand how institutions affect the return to human capital, i.e. the impact of human capital on the firm's innovation results. At the same time, to the best of our knowledge there are a limited number of studies examining the impact of institutional conditions on the effect of human capital on innovation. Based on the empirical studies discussed above, we have developed our own

econometric model to estimate the impact of human capital on innovation, taking into account the quality of institutions. We believe that the institutional environment can have a significant impact on innovation factors, including human capital. The next section is devoted to data and methods employed in our research.

2.   Data and Methods

In this paper we employ data from the Business Environment and Enterprise Performance Survey (BEEPS data)[12], conducted by the World Bank and the European Bank for Reconstruction and Development for the years 2012-2014. The survey contains information on financial indicators of the Russian firms, features of firm's activity, staff and management characteristics, and the impact of business climate on firm's activity. The sample includes 1564 manufacturing enterprises from 37 regions of the Russian Federation and more than 20 industries[13].

In addition, ICSID (International Center for the Study of Institutions and Development, Higher School of Economics, Moscow) database on economic and political indicators for the Russian regions is used to account for institutional conditions at the regional level. This database was created within the project "Institutions and Economic Development: the Role of Bureaucracy and Experiments and an Instrument for Reform Analysis and Evaluation" (2011-2013), supported by the Basic Research Program of the National Research University Higher School of Economics. It includes performance indicators of executive authorities, such as efficiency of executive power. This indicator is integral and contains efficiency indexes (ranks) in various elements, including general level of efficiency, working efficiency of executive authorities, efficiency of public spending, assessment of performance of executive authorities by citizens, and fields of activity of executive authorities – economy and public administration, healthcare, education, construction and housing & public utilities.

This index is built on the basis of the relevant regulatory act and provides an objective comprehensive assessment of the effectiveness of authorities. The latest data is available for 2010. During the period 2010-2014 there was no abrupt change of power. The changed federal

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[12] Business Environment and Enterprise Performance Survey - BEEPS. (2012-2014). Enterprise Survey. [ONLINE] Available at: ebrd-beeps.com. [Accessed 02 February 2017].
[13] Food industry, Tobacco products, Textile, Clothing, Tanning and leather, Wood (forest industry), Paper and paper products, Publish and printing, Furniture, Coke and petroleum products, Plastics and rubber, Non-metallic mineral products, Basic metals, Finished metal products, Chemical products (pharmaceuticals, etc.), Cars and equipment, Office equipment, Electronics, Communication equipment, Precision tools, Motor vehicles, Other transport equipment, IT- industry

and regional authorities adhered to the development program of the leading party of the country. From this point of view, we believe that the data for 2010 fully reflect the period of the enterprise survey. In other words, we argue that such indicator, as a whole, characterizes the institutional environment of the region in which firms operate. Data on firms in the BEEPS has been collected for several years, starting in 2011.

To take into account the influence of institutional conditions in the model, we divide the data on firms into two subsamples: (1) firms located in the regions with high efficiency of executive authorities (ranks<40 in the overall ranking), and (2) firms operating in the regions with low efficiency of executive authorities (ranks>=40 in the overall ranking). The lists of regions according to this criterion are provided in Table 1 below.

Tab. 1: Groups of regions according to efficiency of executive authorities

Group 1: regions with high efficiency of executive authorities	Group 2: regions with low efficiency of executive authorities
Belgorod region, Voronezh region, Kaliningrad region, Kaluga region, Kemerovo region, Krasnodar territory, Leningrad region, Moscow city, Moscow region, Novosibirsk region, Omsk region, Perm territory, Primorsky territory, Republic of Bashkortostan, Republic of Mordovia, Republic of Tatarstan, Rostov region, Samara region, Saint Petersburg, Sverdlovsk region, Stavropol territory, Tomsk region, Chelyabinsk region	Yaroslavl region, Ulyanovsk region, Nizhny Novgorod region, Murmansk region, Kursk region, Kirov region, Khabarovsk territory, Krasnoyarsk territory, Lipetsk region, Smolensk region, Volgograd region, Irkutsk region, Republic of Sakha (Yakutia), Tver region

Source: Author's calculation based on ICSID data.

Researchers measure innovation by the inputs involved in the process of innovations (R&D or venture capital investments), by intermediate results, for example, patents, and by a final result of innovation effort, for example, the count of new products, while each measure captures only some aspects of innovation (Carlino and Kerr, 2015). Lööf et al. (2003) and Janz et al. (2004) consider innovative sales per employee, while Hall et al. (2008) and Duguet (2006) use probability to implement various types of innovations (product, process, etc.). Teplykh (2018) uses dummy-variable reflecting firm's external reward for its new product as an innovative indicator and studies the period from 2004 to 2011, i.e. before and after economic crises. We have analyzed a number of measures of innovations, including sales of innovative products of a firm and chosen the number of new or significantly improved products per employee as a dependent variable. This measure allows us to analyze actually introduced new

products, taking into account the size of an enterprise. As the focus of our attention is innovative results, we find this measure appropriate.

Estimation is based on the following idea. We subdivide the sample into two subsamples based on whether a firm is located in a region with high or low efficiency of executive authorities. Then we look, what is the impact of each variable on innovations in each of the subsamples. It allows us to say, how the factors, such as human capital, can realize themselves in performing innovations depending on the efficiency of executive authorities in a region.

Based on previous studies (Cirera, 2015; Janz et al., 2004; Hanousek and Kochanova, 2016; Lööf et al., 2003) we have developed the following model:

$$innov_{ijr} =$$
$$= \beta_0 + \beta_1 training_{ijr} + \beta_2 Z_{ijr} + \beta_3 Industry\,dummies + \beta_4 Region\,dummies + \varepsilon_{ijr} \quad (1)$$

where:

- $innov_{ijr}$ – the number of new or significantly improved introduced products per employee of a firm i, industry j and region r. It is dependent variable of the model chosen to reflect actual innovative activity of firms. As mentioned earlier, the variable was divided by the number of employees to account for the size of the enterprise. This indicator reflects the result of innovative process.

- *training* – dummy variable, equal to 1, if a firm conducted formal training programs for permanent full-time employees, and 0 otherwise. This indicator reflects human capital at the firm level and is the main independent variable in the model. As highly qualified personnel with special skills is important for innovation staff training is necessary and useful. We believe that staff training affects the capabilities of firms to understand the needs of consumers and to introduce products that will find demand on the market.

Along with this variable, BEEPS contains an indicator characterizing the share of full time employees who completed a university degree. However, we believe that the dummy variable of training by the company is a better indicator due to the specific knowledge needed for introducing innovations. Our choice of variable is also connected to the nature of higher education in Russia, where it is considered to be if not essential, then at least highly preferable education level to have. Therefore, most of school graduates enroll in higher education, which not necessarily will be related to their field of work in future.

- Z – a list of firm-specific attributes that can also influence innovations. They include age in years; dummy variable, equal to 1, if a firm is involved in direct export; dummy variable, equal to 1, if more than 25% of a firm is owned by private foreign individuals.

Startups and young firms are assumed to be more prone to innovation, although large and mature firms tend to have more opportunities and access to resources for innovative activities. The presence of export allows a company to expand sales markets and get more benefits from innovation. In addition, international competition promotes more frequent product updates. Foreign participation in the company opens up access to foreign knowledge and technologies useful for innovation.

- *Regional and industrial dummies* are included in the model to take into account variations across regions and industries, respectively.

Table 2 provides descriptive statistics of the variables involved in the model.

Tab. 2: Descriptive statistics of variables

Variable	Mean	Std. Dev.	Min	Max
Number of new or significantly improved introduced products	7.619	16.696	1	100
Age	12.819	13.266	0	174
Formal training programs	0.449	0.498	0	1
Foreign ownership	0.032	0.175	0	1
Direct exporter	0.098	0.297	0	1

Source: Author's estimation based on BEEPS 2012-2014.

As can be seen from the table, on average, firms covered by BEEPS 2012-14 introduced 8 new products, and their maximum number was 100. The average age of the companies was almost 13 years old, the most mature company being 174 years old. On average, 45% of firms trained their employees. Small average values are found in the indicators of direct export (10% of firms are direct exporters) and foreign ownership (is observed for 3% of firms).

The model is evaluated for two groups of firms: firms located in the regions (1) with high efficiency of executive authorities and (2) with low efficiency of executive authorities. We assume that in the regions with low efficiency of executive authorities, human capital of a firm will produce a smaller positive effect on innovation, since weak institutional environment in the region impedes the introduction of new products.

Given the nonnegative count dependent variable, the model is estimated using negative binomial regression. Standard errors are corrected for greater reliability of estimates. Estimation results are presented in the next section.

3.   Results and discussion

Below are the results of the model with the number of new or significantly improved introduced products per employee as a dependent variable for two subsamples (see Table 3).

Tab. 3: Results of the model for two groups of Russian firms

Dependent variable – number of new or significantly improved introduced products per employee	Firms in regions with high efficiency of executive power (1)	Firms in regions with low efficiency of executive power (2)
Formal training programs for permanent full-time employees, dummy-variable	0.3379*	-0.0162
Age	-0.0418***	-0.0411*
Direct exporter	-0.6922**	0.1961
Foreign ownership (more than 25%)	0.7860*	0.1612
Industry dummies	Yes	Yes
Regional dummies	Yes	Yes
R-squared	0.18	0.19
Wald test	1647.24***	3286.65***
Number of observations	1030	499

*** Significant at the 1% level, ** - at the 5% level, * - at the 10% level.

Source: Author's estimation based on BEEPS 2012-2014 and ICSID 2011-2013.

Results for the firms located in the regions with high efficiency of executive power show that staff training has a positive and significant effect on the number of new or significantly improved introduced products per employee. To create a new product, updated, valuable knowledge and fresh ideas are needed, and training programs for employees help here. A negative sign for age indicates that young firms and startups are more involved in innovation process. This seems logical because such firms especially need new products to survive in a globalizing market.

Firms involved in direct exports introduced fewer new products per employee. On one hand, this seems counterintuitive; on the other hand, it is more difficult for firms, especially small and medium-sized ones, to promote new products on the international market due to high competition and limited opportunities, including financial ones. This result can also be linked to the current specialization of Russia in international trade. Foreign ownership of a firm proved to be favorable for innovation. The reasons is probably that foreign resources, experience and an approach to managing innovation process can become the key to successful implementation of innovations. Thus, in the regions with favorable institutional environment, firm's human capital, along with the other factors, can make a valuable contribution to innovation.

For the firms located in the regions with low efficiency of executive power the results differ substantially. Only the age of firms affects the number of firms' new products per employee in these regions, other factors being insignificant based on data available to us. In other words, in the regions with weak institutional environment, the contribution of human capital to innovation is depreciated and produces less effect on the innovation result. People with high level of human capital in such regions may face various bureaucratic difficulties that impede their activities in innovation. Therefore the impact of human capital can become even insignificant, as our results demonstrate. The same applies to direct export and foreign ownership of firms. In such environment, it is young firms and startups that become the engines of innovation, as evidenced by the negative sign of the age of firms. And large firms, despite their resources and capabilities, are more passive in innovation.

Besides, the total number of new introduced products in the regions with high efficiency of executive power amounted to 3,009, while in the second group this indicator is less than half this number, 1,281 new products. While there are more firms in the regions with high efficiency of executive power (see Table 3), average number of products per firm is also greater in this group, 2.9 vs. 2.6.

The results reflect serious problems and consequences that a poor institutional environment can create, including lack of innovation and loss of potential benefits from it. From this point of view, regional authorities need to think about measures needed to reduce institutional barriers and increase the efficiency of authorized bodies.

Conclusion

In this paper we analyzed the role of institutions in the returns to human capital within the innovation process. The aim of our research was to reveal to what extent institutional environment affects possibility for highly qualified personnel to employ their knowledge and time in a way beneficial for progress in innovation.

The results demonstrate positive impact of human capital on innovations in the regions with high efficiency of executive power, the impact in the regions with lower efficiency being insignificant. Besides, in the regions with high efficiency of executive power the number of new products is observed to be relatively higher. Innovations were measured as the number of new or significantly improved introduced products per employee.

The number of new introduced products for young firms was found to be higher. Most likely, this occurs due to high competition in the market, which is critical for small and medium-sized firms. The same time, due to high competition it is difficult for the firms to sell new

products in foreign markets, as evidenced by the negative impact of direct exports variable. Foreign ownership of a firm leads to advantages in innovation, probably because it allows firms to gain foreign experience in all aspects of production, management and marketing, which can become the key to the successful introduction of new products.

In the modern times it is essential both for individuals and for the firms to be able to communicate and to adapt someone else's valuable knowledge which can possibly lead to creation of one's own ideas. International activities in this respect provide diverse opportunities for development. Besides, foreign firms investing abroad tend to be more productive and successful, and therefore they are a source of knowledge spillovers.

In the regions with low efficiency of executive power, only the age of firms affects the number of new products per employee. When the institutional environment is not satisfactory, only startups and young firms can promote innovation. In this sense, large firms are more passive, although they have better opportunities to introduce new products. In these regions, it is more difficult for people with high level of human capital to realize their potential in innovation. The same applies to direct export and foreign ownership of firms.

The results lead to the conclusion that in the regions with a favorable institutional environment, specifically the efficiency of executive power, the firm's human capital, along with other factors, is able to make a valuable contribution to innovation. Overall, results of our research shed some light on factors that facilitate innovations on the firm and regional levels, paying specific attention to regional institutional environment. For the future research it would be useful to analyze the role of a wider range of institutional factors and, in addition, to consider other dimensions of innovation, pull and push factors for building the model.

Acknowledgment

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SOCIAL BUSINESS ENTREPRENEURSHIP AND BUSINESS FREEDOM: AN EVIDENCE FROM THE RUSSIAN FEDERATION

Rasel Miah – Svetlana Viktorovna Panikarova

Abstract

Purpose: The major concentrating area of our study is to contribute to the existing literature of entrepreneurial activities related to the social business entrepreneurship by considering the Business Freedom as the Business Confidence of the entrepreneurs of the Russian Federation, where how Gross National Income per capita and Subnational Human Development influence the Business Confidence of the social business entrepreneurship in the short-run and long-run.

Design/methodology/approach: The Vector Error Correction Model helps us measuring the short-run and long-run association among variables Business Confidence Index, Gross National Income Per Capita, and Subnational Human Development Index considering a quarterly basis data between the years 1995 and 2018. We apply the Vector Error Correction Model when the endogenous variables are cointegrated. We have differenced the equation and include an error-correction term measuring the deviation of the previous period from long-run equilibrium.

Findings: Our target dependent variable is the Business Confidence Index. In the short run, the log of Gross National Income per capita, and the Subnational Human Development Index do not influence Business Confidence Indexes. The First and the Second lagged values of the first difference of Business Confidence Indexes significantly influence itself. The cointegrating equation P-value is statistically significant in the short run at the 1 % significant level. In the long-run, Gross National Income per capita positively and Subnational Human Development Index negatively observe the Business Confidence Index at the 1 % significant level.

Research/practical implications: We believe our investigation will additionally support and promotes social business entrepreneurs for improving business conditions for the established and new enterprise and entrepreneurial activity in the Russian Federation and other countries.

Originality/value: Empirically, the study will encourage local and global entrepreneurship by engaging in entrepreneurial activity towards a positive change.

Keywords: social business, entrepreneurship, business freedom, business confidence, Russian Federation

JEL Codes: C3, L3, M13, O035

Introduction

Nowadays, business changes the living standard of the citizens of a country by developing their economic condition from the situation, where they experience a lot of suffering because of the lack of financial and other available resources, even every day a country is introducing Social Business Entrepreneurship. The core aspiration of this study is to demonstrate the prescribed association between Social Business Entrepreneurship and Business Freedom: An Evidence from the Russian Federation. This paper examines the roles of social entrepreneurship in developing investment sectors, especially introducing social business enterprises in the Russian Federation. This article evaluates the contribution of social entrepreneurship in the business scenario considering business confidence, Gross National Income per capita, and subnational human development of the Russian Federation. This article determines how social entrepreneurs behave towards changing the economy of the Russian Federation, the welfare of social entrepreneurship creates a strong relationship with the society and the human capital of a social entrepreneur impact on business freedom of the country.

Innovation drives business ventures by focusing on social welfare, health, and education. The drivers of the business sectors help an enterprise cope up with the impact of some changes that include demographic, migration, and environmental. Researchers, business owners, and policymakers classify these business activities in Social Entrepreneurship (SE) that describe a collaboration between society and entrepreneurship. In today's business world, entrepreneurship influences the economic growth of the countries and develops economies globally. Entrepreneurship has a strong association with human capital. Individuals' skills, knowledge, and capabilities impact his or her behavior and entrepreneurial activity. The country's employment opportunities increase due to its economic power. Employment opportunities care about the diversity of the activities related to economy and incomes. In the least developed countries, young generations prefer jobs to become employees than starting a business. Preferring jobs become more attractive because of the availability of financial resources, human capital, and other issues related to social and administrative complexities.

In the case of Russia, economic growth becomes interesting because of the economic and social indicators that make the country different from others and provinces different from each other. The nation as a whole and regions differ due to the innovative creation and economic growth. Investment money, time, and energy into a new business become risky. At the early stage of business, the firm does not generate substantial financial cashflows. Few enterprises make profits and add something to economic growth.

The study of GEM (Global Entrepreneurship Monitor) shows entrepreneurship acts as a fundamental tool for creating jobs, generating wealth, and highlighting economic growth and development in the 21st century. Nowadays, business leaders play an indispensable role in sustainable development and implement learning into businesses. At the same time, modern entrepreneurs set, manage, and operate small, medium-sized, and large complex organizations, and ensure the availability of financial resources and human capital for the enterprise. The entrepreneur ensures the success of a business for the long-term by handling business, economic, and operational risks through the modification of the investment strategy. Human capital (skills, knowledge, and capabilities) becomes one of the prominent issues for long-term competitiveness. Entrepreneurs may have a direct link to academia or not. Highly educated or semi-skilled entrepreneurs become one of the essential determinants for the success of a business. Highly trained persons have both opportunities, decent job and self-employment (Global Entrepreneurship Monitor, Global Report 2018/2019, and Global Report 2019/2020).

Entrepreneurship scholars have explored the study of entrepreneurial activity and its measurement in various ways for a long time. Some remarkable literature has reviewed by Dvouletý (2018) by stating the most common approaches to calculating entrepreneurial activity. The first approach is Survey-based measures, for example, Labor Force Survey or Global Entrepreneurship Monitor. The second approach is coming from national structural business statistics measurement. Both strategies have advantages and disadvantages as well. Dvouletý (2018) has noticed the survey data of power and reliability is from the initial sample size, which limits the data extrapolation on the lower administrative units. Business registers data do not contain the early stage of entrepreneurial activity. Non-active business data may include in the first stage of entrepreneurial activity.

Professor Muhammad Yunus, who is a Nobel Laureate of Bangladesh, and a social entrepreneur, has initiated Social Entrepreneurship. Muhammad Yunus is a banker, an economist, and civil society leaders, a founder of the Grameen Bank, and a pioneer of the concepts of micro-credit and micro-finance. Professor Yunus has also identified the following characteristics of social business. First, Social Business (SB) concentrates on social and environmental objectives. Without creating an approved list of societal problems, Social Business continues its activities. A list of social missions would limit the entrepreneurial spirit related to encouraging issues and closing off the upcoming events. Second, Social Business focuses on social problems by considering a way associated with financial and substantial factors. Social Business deals with social objectives without compromising profit, especially in a non-profit motive.

Social Business reinvests money in the firm expanding and developing product and service quality without giving dividends to investors. Third, autonomy becomes another characteristic of the Social Business, where some social enterprises have a journey to independence. Fourth, Social Business counts institutions, foundations, enterprises, governments, donor agencies, charities, and entities who desire to interlock in self-sacrifice investment in the human being who promotes the well-being of living society as active social entrepreneurship. Fifth, the social business engages in different social development programs on education, training, progressive schemes, the action of watchdog, distressed people's situation, and skills related learning sessions. Social Business acts as the Non-government, nonprofit, and a voluntary organization, but not as a charity while it has self-sustaining funds to operate and perform tasks. In every sense, Social Business is not a charity while it recovers its full costs achieving social missions.

We examine the short-run and long-run relationship between the social business entrepreneurship and business freedom as the business confidence considering the Gross National Income per capita, and subnational human development of the Russian Federation taking data from Global Data Lab and OECD during the years 1995-2018 considering quarter basis. Exploring the entrepreneurial activities in favor of business confidence becomes the concentrated area of this paper. For investigating the short-run and long-run relation between social business entrepreneurship and business confidence regarding log of Gross National Income per capita and Subnational Human Development Index, we employ the Vector Error Correction Model (VECM) under the supervision of the multivariate time series regression models. In this paper, all variables are endogenous.

The rest of the section of this paper is structured as follows. First, we determine the effectiveness of the social business entrepreneurship in influencing the business sectors of the Russian Federation. Examining the core projects related to the development of the entrepreneurial activities become another essential issue for us to execute a solid explanation describing the real social entrepreneurial business market of the Russian Federation. Second, we focus on the econometric estimation considering the short-run and long-term effect the log of Gross National Income per capita and the Subnational Human Development Index towards the business confidence of the Russian Federation regarding our collected datasets. Third, we employ a Vector Error Correction Model determining the short-run and long-run relationship among target variables business confidence and other two regressors log of Gross National Income per capita and Subnational Human Development Index with time-series quarterly datasets from 1995 to 2018. Finally, we recommend some strategy for economic progress.

1. Theoretical Aspects and Literature Review

The entrepreneurial activity literature is growing slowly over time. Scholars, policymakers, government, and young researchers of many nations still have not studied entrepreneurial activity in many countries and regions yet. The economies of post-communist have not been explored extensively yet. Scholars have noticed there exists an economic transformation in the Post-economist economies in the early 90s (Dvouletý, 2019; Dvouletý, 2017a).

1.1 Theoretical Aspects

Social Entrepreneurship becomes a new concept in the Russian Federation and globally. Professor Muhammad Yunus and Grameen Bank both together work for the poor people of Bangladesh. Professor Muhammad Yunus wins the United States Presidential Medal of Freedom in 2009 and the Congressional Gold Medal in 2010. Grameen Bank provides loans to poor entrepreneurs, who are qualified for traditional bank loans. Grameen Bank provides loans through a micro-credit system that creates economic and social developments at the same time. Muhammad Yunus has mentioned social entrepreneurship expands operational activities by focusing its social objectives, improves and re-modifies goods and services by maintaining standard quality, addresses ways for subsidizing social mission in his book. The name of the book is Creating a World Without Poverty - Social Business and the Future of Capitalism and Building Social Business. Muhammad Yunus has also mentioned the primary purpose of Social Business, through its non-profit organizational business-pursuing activities, becomes achieving specific social and environmental objectives. Muhammad Yunus has discussed two types of social businesses. The first type of social business concentrates on offering products and services based on a specific goal associated with social, ethical, and environmental, for example, Grameen Danone. The second type of social business that deals with profit. It has operated by the poor or other parts of the society that may be underprivileged. These poorest or non-privileged receive financial benefits directly or indirectly. The professor has mentioned the name of Grameen Bank that owns by the poor people. Social business improves the situation of the firm with its brands, draws the attention of new customers, does something better according to the legislation, and deals with the customers' satisfaction issues. A social business sets the prices at reasonable to clients, retains with customers, and repeats enterprise projects by concentrating on social objectives and gives an extra-leg to the communities. Seven principles related to social business has indicated by Professor Younus. First, Social Business works for reducing poverty from society by concentrating on threatening problems like education, health, technology access, societal and environmental without maximizing profit.

Second, it will maintain the sustainability associated with financial and economic issues. Third, this business does not give any dividends in terms of investments, where investors cooperate by getting back the initial amount only. Fourth, the profit of the organization stays at the funds of the enterprise to further expansion and improvement while paying back invested money. Fifth, social business becomes aware of environmental issues. Sixth, it ensures a standard salary package with a better working environment for the workforce. Seventh, it operates activities with joy (Grameen Bank, Websie).

Social Business Entrepreneurship in the Russian Federation

The corresponding writers of this study have noticed entrepreneurs experience challenges and problematic issues to start a business. They notify challenging puzzles are waiting for entrepreneurs while exploring the Russian market and economic condition to create a new venture. The situation of entrepreneurs will not be in a stable platform due to the lack of financial resources and its diversification, entrepreneurial competencies, and some other governmental, societal, and environmental issues. Financial intermediaries, non-government finance institutions, and friends and family members become the essential sources of finance for the entrepreneurs. Training increases the unique competencies of an individual. These competencies influence on job opportunities, performance, working situations, happiness, and business power. Social entrepreneurship faces challenges in building human assets stocks and competencies and expanding business activities based on social objectives. Social ventures and entrepreneurial activities have influenced by human capital and its acquisition. Human capital fills the shortage of internally available resources and the situation of the external labor market.

The development of human capital depends on investing money in training, education, and health care, motivating and rewarding working people, developing policies, and creating a design for context. The Russian Federation has experienced difficulties with its social development associated with economic, social, and environmental to maintain Sustainable Development Goals. Challenges arise due to the lack of investment in empowering women and minority groups, research, and development to deal with climate change. The country faces problematic issues due to food insecurity, sustainability, and improving human capital investment and its return. Social and political issues create the problem as well.

1.1.1.1 Our Future Project by Vagit Yusufovich Alekperov

The President, named Vagit Yusufovich Alekperov of Lukoil, a leading Russian oil company, has formulated a fund by calling Our Future to support social entrepreneurs of every region of

the Russian Federation. Vagit introduces a contest selecting social entrepreneurs with adequate human capital skills to provide long-term loans without interest.

Vagit Alekperov provides loans to best projects, assistance renders, beginners, consulting firms, legal and accounting service providers, and offers to rent opportunities to small-medium sized enterprises. Vagit Alekperov, a Russian Businessman, has formed a foundation named Our Future with a mission to change society positively through the contribution to develop, support, and finance social entrepreneurship, who work willingly solving social problems. It's activities have done by the help of two online resources that include the portal New Business: Social Entrepreneurship (New Business Social Entrepreneurship Forum, www.nb-forum.ru) engage in publishing articles and comments by focusing on Russian and worldwide social enterprises and entrepreneur activities and another one the Bank of Social Ideas (New Business Social Entrepreneurship Forum, www.bank.nb-forum.ru) take part in generating ideas, building social enterprises, and attracting potential investors. The value of his wealth is $ 20.2 Billion (Forbes, 2019). Alekperov helps 59 social enterprises by prodiving $ 4 million from the foundation period of the project for five years.

1.1.1.2 Micro-finance or Micro-loans and Russian Micro-finance Center

The President, Michael Mamuta, of Micro-finance Centre of the Russian Federation (RMC) that established in 2002, has said the enterprise supports social business and Non-government organizations deal with societal activities. Micro-finance Centre of the Russian Federation operates a business with mission statements associated with the community initiatives created by the Council of Social Business Development under the Russian Chamber of Commerce and the local and international partners under different projects, including Grameen Creative Laboratory, Yunus Center, and Yunus Social Business (Russian Microfinance Center, 25.10.2011). Social business has introduced by providing micro-finance to entrepreneurs. Micro-finance Centre of the Russian Federation offers micro-finance more than 600 institutions in the Russian Federation through its networking coverage system. As a result, social entrepreneurs receive loans with low interest from local regions (Russian Microfinance Center, 25.09.2011).

In general, the interest rate of micro-finance is high, whose percentages are more than 25 % in the Russian Federation. However, Micro-finance Centre of the Russian Federation has discussed with the government in developing the overall condition of social entrepreneurship in the Russian Federation through governmental support. Social business has introduced in a village named Linevo of the Russian Federation. The project encourages its development by

offering micro-loans up-to $ 30,000 under a plant project to start social enterprises under a partnership scheme between the Novosibirsk Electrode Plant and Micro-finance Centre of the Russian Federation.

1.1.1.3 Citi Foundation

An eco-business has introduced to provide micro-loans developing Altai and Tuva regions and starting a small sustainable business to people who are living in the Altai Republic, a remote mountain area, by an official contract between Citi Foundation and World Wildlife Fund (Citi Foundation, 19.09.2012). St. Petersburg State University Management College offers a short program under the project associated with social entrepreneurship of Citi Foundation Investment Scheme Social Development (CFISSD) (Citi Foundation, 12.12.2010). Participants do not pay any fee since November 2012. Citi Foundation Award has annonched from 2013 (Russian Microfiance Center, 09.04.2014).

1.1.1.4 The Best Kinder garden by Marina Bakulina

An individual Entrepreneur Marina Bakulina wins a contest as the nominee as Socially Responsible Business and The Best Kinder garden. Marina and her sister and parents have introduced a project naming the Children's Development Center Steps in Tyumen in 2004. Bakulina has experienced difficulties because of initial capital, even having $ 6500 as a bank loan. Marina recruits young, creative, and energetic students. Marina has started working with kids whose age starts from six because of having non-standard procedures, risk, and lack of experience. In the city, several centers are working with over 600 children. Maria provides quality assistance, develops skills, education, and treatment to these children. Bakulina and her team have started working with disabled children by creating Tyumen regional public organization in 2008 (Force For Good, 2004).

1.2   Empirical Review

Becker (1975) has noticed the development of human capital involves learning capabilities by accumulating knowledge through providing training, coaching, and job experience. Managers from social enterprises work with different projects associated with social objectives, hold seminars, arrange training and workshops, and consult people in developing skills and knowledge. Social entrepreneurs share their success and experience to encourage the young generation to do the same. Lazear in 2005 has noticed there is a positive impact on entrepreneurial entry and performance because of investing in human capital. Human capital encourages individuals to acquire new knowledge and adjusting to new situations.

Social Business (SB) stabilizes the economy, reduces poverty, invests money in social development programs, and develops human capabilities. Researchers have mentioned research on entrepreneurship have shifted from micro to macro perspectives, a close connection exists between entrepreneurship and economic development on emerging economies.

Social Business varies across countries because of theoretical and empirical research gap in the developing and developed countries. However, exploring the relationship between economic growth and entrepreneurship will have remarkable research value (Bruton, Ahlstrom, and Obloj, 2008). Stephan et al. (2015) have noticed social entrepreneurship contributes to social welfare through its core aspiration that related to higher education, preferences, and motivation.

Most of the clients of Social Business are from the low-income group of the population, who do not have enough access to the enough demand for services based on the needs. In such cases, consumer and social service producers engage in quasi-market mechanisms because of introducing direct intermediary between them. Social Busines experience challenges because of maintaining sustainable development. Social Business becomes the most efficient users of resources provided to solve the problems of helpless groups within the skeleton of state plans (Moskovskaya and Soboleva, 2016).

Social Business enterprises provide moral and psychological and practical supports, deal with the information relating to the provision of legal, organizational, and medical issues without taking any financial benefits. SB often provide facilities to others free of charge. Social Business entrepreneurs improve social protection by making a significant contribution to society, local communities, and country. Developed and developing countries' governments contribute financially to the development of the social entrepreneurship sectors of the country. Emerging market economies significantly influence investment in the social entrepreneurship sector. The government and corporations make a significant investment in improving the condition of the social entrepreneurial areas. The mutual benefit and cost comparison of Social Business highlights the plan of social policy (Moskovskaya and Soboleva, 2016).

Scholars have analyzed the multiple regression analysis determining the relationship between the entrepreneurship location factors and activity levels (Roman et al., 2018). Scholars have begun exploring the geographic entrepreneurial action factors weighing area, regions, town, and city levels. They lower down the empirical analysis level. Shifting from empirical analysis to regional level becomes indispensable because of meeting long-term policy goal. These policy goals boost and establish the ecosystem of the rural entrepreneurship (Dvouletý, 2017a).

2. Data and Methodology

2.1 Data and Data Source

The prime concern of this paper is to determine the relationship between the social business entrepreneurship and business freedom as the Business Confidence of the Russian Federation. However, we have used time-series quarterly data from 1995 to 2018 for conducting the econometric analysis of this paper. We have considered the Business Confidence Index from OECD, log of Gross National Income (GNI) per capita as thousands of US $ (2011 PPP) and Subnational Human Development Index from Global Data Lab for the analysis because of the availability of the data. Our collected data becomes stationary after the first difference, meaning the series is *I(1)*, based on Augmented Dickey-Fuller and Phillips-Perron Unit Root Test. At the same time, we employ the Gregory-Hansen Test for Cointegration to identify the structural break of the model and Johansen tests for determining the rank of the cointegration among variables. After performing the Johansen Cointegration, we notice that in our model, we have one cointegrating equation. Therefore, we implement the Vector Error Correction Model (VECM) for econometric analysis determining the short-run and long-run relationship between the social business entrepreneurs and financial freedom in favor of the Russian Federation.

2.2 Methodology

Formulating Econometric Equations for this Research Paper

Sims (1980, p.26-28) has introduced a prevalent method, which is VAR, for analyzing time-series modeling. In the VAR system, the model contains a set of endogenous variables, where all variables are the dependent variable. Each endogenous variable has expressed as a linear function of p lags of itself, and one reduced-lag of other variables and an error term in the model. Researchers notice there is a covariance relationship that exists between the variables in Y_t and X_t while estimating VAR model parameters. The covariance takes place among variables when their first two moments are finite and time-invariant. If the variables in Y_t are non-stationary at level, but they are stationary at first difference, then, researchers may use VECM. For the simplicity of this paper, first we execute VAR model with our targeted variables due to estimating the VECM for econometric analysis.

2.2.1.1 Vector Autoregressive (VAR) Model Specification

$$buscndx_t = \sigma + \sum_{i=1}^{k} \beta_i \, buscndx_{t-i} + \sum_{j=1}^{k} \emptyset_j \, lngnipc_{t-j} + \sum_{m=1}^{k} \varphi_m \, subnhdi_{t-m} + u_{1t} \; ..... \; (1)$$

$$lngnipc_t = a + \sum_{i=1}^{k} \beta_i \, buscndx_{t-i} + \sum_{j=1}^{k} \emptyset_j \, lngnipc_{t-j} + \sum_{m=1}^{k} \varphi_m \, subnhdi_{t-m} + u_{2t} \; ...... \; (2)$$

$$subnhdi_t = \vartheta + \sum_{i=1}^{k} \beta_i \, buscndx_{t-i} + \sum_{j=1}^{k} \emptyset_j \, lngnipc_{t-j} + \sum_{m=1}^{k} \varphi_m \, subnhdi_{t-m} + u_{3t} \; ..... \; (3)$$

2.2.1.2 Vector Error Correction Model (VECM) Specification from VAR

Researchers employ an Error Correction Model (ECM) for an appropriate econometric specification if at least one cointegrating equation exists among variables. In the ECM, researchers have differenced the equation and include an error-correction term measuring the deviation of the previous period from long-run equilibrium. The ECM requires a new test for cointegration. If there is no cointegration, there is no cointegrated relationship among the series. In such cases, researchers perform only VAR for an appropriate econometric specification. Sims (1980, Chapter 5, p.95) has introduced Vector Error Correction Model. In the VECM, the error correction term comes up with only one lagged difference. The VECM is

$$\Delta Y_t = \sigma + \sum_{i=1}^{k-1} \gamma_i \Delta Y_{t-i} + \sum_{j=1}^{k-1} \eta_j \Delta X_{t-j} + \sum_{m=1}^{k-1} \xi_m \Delta R_{t-m} + \lambda ECT_{t-1} + u_t \tag{4}$$

where, ECT_{t-1} is the lagged OLS (Ordinary Least Squares) residual obtained from the long-run cointegrating equation, $Y_t = \sigma + \eta_j X_t + \xi_m R_t + u_t$. Later, it comes up with the cointegrating equation, $ECT_{t-1} = [Y_{t-1} - \eta_1 X_{t-1} - \xi_1 R_{t-1}]$.

The Error Correction Term (ECT) explains that the previous period's deviation from long-run equilibrium, which is an error, influences short-run movement in the dependent variable. λ is the coefficient of the ECT and the speed of adjustment, which measures the acceleration at which y returns to equilibrium after changes in X and R. For this paper, we formulate the following equations for determining the short-run and long-run relationship of the social business entrepreneurship corresponding to their business confidence, gross national income per capita, and sub-national human development issues of the Russian Federation. In a VECM, all variables are endogenous.

$$\Delta buscndx_t = \sigma + \sum_{i=1}^{k-1} \beta_i \Delta buscndx_{t-i} + \sum_{j=1}^{k-1} \emptyset_j \Delta lngnipc_{t-j} + \sum_{m=1}^{k-1} \varphi_m \Delta subnhdi_{t-m} +$$
$$\gamma_1 ECT_{t-1} + u_{1t} \tag{5}$$

$$\Delta lngnipc_t = a + \sum_{i=1}^{k-1} \beta_i \Delta buscndx_{t-i} + \sum_{j=1}^{k-1} \emptyset_j \Delta lngnipc_{t-j} + \sum_{m=1}^{k-1} \varphi_m \Delta subnhdi_{t-m} +$$
$$\gamma_2 ECT_{t-1} + u_{2t} \tag{6}$$

$$\Delta subnhdi_t = \vartheta + \sum_{i=1}^{k-1} \beta_i \Delta buscndx_{t-i} + \sum_{j=1}^{k-1} \emptyset_j \Delta lngnipc_{t-j} + \sum_{m=1}^{k-1} \varphi_m \Delta subnhdi_{t-m} +$$
$$\gamma_3 ECT_{t-1} + u_{3t} \tag{7}$$

where, **K-1**= The lag length is reduced by 1. $\boldsymbol{\beta_i, \emptyset_j, \varphi_m}$ is the short-run dynamic coefficients of the model's adjustment long-run equilibrium. $\boldsymbol{\gamma_i}$ is the speed of adjustment parameter with a negative sign. $\boldsymbol{ECT_{t-1}}$ is the error correction term is the lagged value of the residuals obtained from the cointegrating regression of the dependent variable on the regressors. Contains long-run information derived from the long-run cointegrating relationship. $\boldsymbol{u_{it}}$ = Residuals commonly

known as stochastic error terms, where stochastic error terms often called impulses, or innovations or shocks.

3. Results

3.1 Descriptive Statistics

Tab. 1: Descriptive Statistics Business Confidence Index, Log of Gross National Income per capita , and Sub-national Human Development Index

Variables	Business Confidence Index	Gross National Income (GNI) per capita [of thousands US $ (2011 PPP$)]	Sub-national Human Development Index
Mean	99.21660	19.38750	0.761000
Standard Deviation	2.474171	4.897523	0.041445
Min	94.34050	11.53344	0.700844
Max	103.2490	25.29750	0.824156
Variance	6.121524	23.98573	0.0017177
Skewness	-0.127571	-0.348235	-0.006724
Kurtosis	1.948743	1.473939	1.665817
Observations	96	96	96

Source: Author's Calculation, STATA and EVIEWS.

The Mean average of the Business Confidence Index is 99.21660. The deviation from the sample Mean is 2.474171. The minimum value is 94.34050, and the highest is 103.2490 in this series. The dispersion among the observations in this series, which is variance, is 6.121524. The Skewness value is -0.127571, where it measures the degree of asymmetry for this series. Zero is the standard skewness value. So, we can easily conclude that the business confidence index mirrors a normal distribution because skewness values are -0.127571. The Kurtosis value is 1.948743. The data has a normal distribution, where the kurtosis value must be 3. The kurtosis is 1.948743, which is less than 3. We can conclude that the business confidence index is platykurtic. So, the shape is going to have a flat surface.

The Mean of Log Gross National Income (GNI) per capita in thousands of US $ (2011 PPP) is 19.38750, and the standard deviation is 4.897523. The minimum is 11.53344, and the highest value is 25.29750. The diversity is 23.98573. The Skewness value is -0.348235, which mirrors a normal distribution but negatively skewed while the kurtosis is 1.473939. Skewness reflects a platykurtic kurtosis, which is less than 3. The Mean value of Sub-national Human Development Index is 0.761000, and the standard deviation is 0.041445. The minimum is 0.700844, and the highest is 0.824156. The variance is 0.0017177. The Skewness value is

negative, which is -0.006724. Skewness mirrors a normal distribution, but negatively skewed. The kurtosis is 1.665817, which reflects a platykurtic kurtosis.

3.2   Correlation and Covariance Matrix

Tab. 2: Correlation and Covariance Matrix

Covariance			
Correlation			
t-Statistic			
Probability	**Business Confidence Index**	**Log of Gross National Income per capita**	**Sub-national Human Development Index**
Business Confidence Index	6.057758		
	1.000000		
Log of Gross National Income per capita	9.891142	23.73588	
	0.824874	1.000000	
	14.14687	-----	
	0.0000	-----	
Sub-national Human Development Index	0.074651	0.194178	0.001700
	0.735672	0.966727	1.000000
	10.53034	36.63923	-----
	0.0000	0.0000	-----

Source: Author's Calculation, STATA and EVIEWS.

The correlation matrix illustrates there is a strong positive correlation exists between the business confidence index and the Log of Gross National Income per capita and sub-national human development index at 1 % significant level. The log of Gross National Income per capita has a strong correlation with and sub-national human development index at 1 % significant level. The business confidence index has an ordinary association with the log of Gross National Income per and sub-national human development index.

3.3   Optimal Lag Selection and Unit Root Test of the Model

Researchers often consider AIC (Akaike Information Criterion) and (SIBC) Schwartz-Bayesian Information Criterion to choose the optimal lag length of the series. Figure (1) shows the non-stationarity and stationarity of the series at the level and first difference. The figure illustrates the series becomes stationary after taking the first difference.

Tab. 3: Optimal Lag Selection and ADF and Phillips-Perron Unit Root Test of the Model

VARIABLES	AIC	AUGMENTED DICKEY FULLER (ADF)				Decision
		LEVEL		FIRST DIFFERENCE		
		Intercept	Trend and Intercept	Intercept	Trend and Intercept	
Business Confidence Index	Lag (3)	- 1.514034	- 1.439017	- 5.535237***	- 5.552204***	I (1) Series
Log of Gross National Income per capita	Lag (2)	- 0.878995	- 1.956472	- 4.434301***	- 4.420395***	I (1) Series
Sub-national Human Development Index	Lag (2)	- 0.431636	- 3.169666	- 4.648382***	- 4.594469***	I (1) Series
VARIABLES		Phillips-Perron UNIT ROOT TEST				Decision
		LEVEL		FIRST DIFFERENCE		
		Intercept	Trend and Intercept	Intercept	Trend and Intercept	
Business Confidence Index		- 1.481093	- 1.730777	- 3.426435**	- 3.448932**	I (1) Series
Log of Gross National Income per capita		- 0.547008	- 1.553135	- 4.416107***	- 4.386773***	I (1) Series
Sub-national Human Development Index		0.058057	- 2.846151	- 4.605814***	- 4.542978***	I (1) Series
Note: * p<0.1, ** p<0.05, *** p<0.01						

Source: Author's Calculation, STATA and EVIEWS.

Fig. 1: Level and First Differnce of Business Confidence Index, Log of Gross National Income per capita , and Sub-national Human Development Index
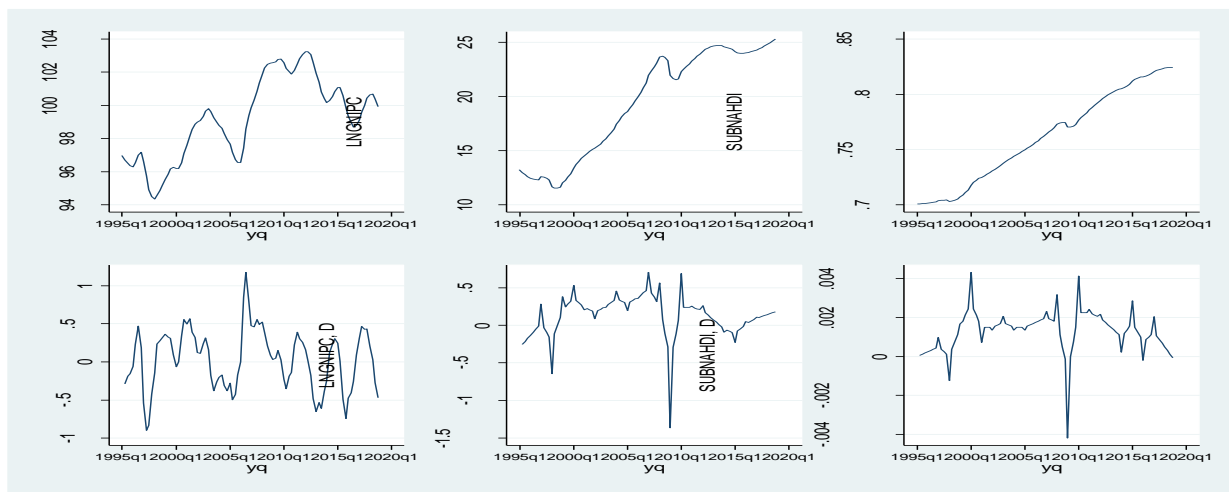
Source: Author's Calculation, STATA.

3.4   Determination of Structural Break of the Model

Tab. 4: Gregory-Hansen Test for Structural Break of the Model

					Asymptotical Critical Values			Decision at 5 % level
		Test Statistic	Breakpoint	Date	1 %	5 %	10 %	
Break, Level	ADF	- 4.38	59	2009q3	-5.44	-4.92	-4.69	Fail to reject null hypothesis, H_0, there is no break point.
	Zt	- 4.33	37	2004 q1	-5.44	-4.92	-4.69	
	Za	- 22.03	37	2004 q1	-57.01	-46.98	-42.49	
Break, Trend	ADF	- 4.38	61	2010q1	-5.80	-5.29	-5.03	Fail to reject null hypothesis, H_0, there is no break point.
	Zt	- 4.26	37	2004q1	-5.80	-5.29	-5.03	
	Za	- 23.28	37	2004q1	-64.77	-53.92	-48.94	
Break, Regime	ADF	- 4.92	59	2009q3	-5.97	-5.50	-5.23	Fail to reject null hypothesis, H_0, there is no break point.
	Zt	- 4.75	52	2007q4	-5.97	-5.50	-5.23	
	Za	- 22.11	52	2007q4	-68.21	-58.33	-52.85	

Source: Author's Calculation, STATA.

If the value of ADF, Zt, and Za are higher than the 5 % critical value, we reject the null hypothesis of there is no breakpoint. If the value of ADF, Zt, and Za are less than the 5 % critical value, we fail to reject the null hypothesis of there is no breakpoint. Hence, in model 1, 2, and 3, the ADF, Zt, and Za are less than the 5 % critical value. We are happy that there is no structural break in our targeted model, which is desirable.

3.5   Johansen Trace and Max-Eigen Test for Cointegration Test

Tab. 5: Johansen Trace and Max-Eigen Test for Cointegration Test with Lags (3)

Rank	Parms	LL	Eigen Value	Trace Statistic	5 % Critical Value	Max Statistic	5 % Critical Value	Decision at 5 % Critical Value
0	21	640.16556	-	16.0999*	29.68	9.7678	20.97	Reject Null hypothesis H_0
1	26	645.04946	0.09970	6.3321	15.41	5.7912	14.07	Fail to reject Null hypothesis, H_0
2	29	647.94504	0.06037	0.5409	3.76	0.5409	3.76	Fail to reject Null hypothesis, H_0
3	30	648.21551	0.00580					
Note: Number of Observations = 93, Lags = 3								

Source: Author's Calculation, STATA.

In Johansen's cointegrating equations, once the value of trace and max statistics is higher than the corresponding critical values at a 5% significance level, we reject the null hypothesis of there is no cointegrating equation. In this regard, we reject the first null hypothesis of no cointegration. It means that we reject the null hypothesis of no cointegration. We conclude there is at least one cointegrating equation among variables in this model.

3.6   Vector Error Correction Model (VECM)

In STATA 14 output, the results represent the short-run coefficients of endogenous variables. The output places the target variable first, while other regressors are listed just below after the target variable. The row of CE1 shows the adjustments coefficients (the speed of adjustments). The row of Ce1 shows the cointegrating equation from the Johansen Normalized Restriction Imposed. Johansen's Normalized Restriction shows the long-run equation from where the value of the Error Correction Model has obtained. Johansen's Normalized Restriction indicates the long-run relation. The Johansen normalized restriction value for the target variable, which is the log of business confidence index, is 1. The error correction term has generated from this long-run equation. For interpretation of the report of Johansen's normalized restriction imposed, the researchers must reverse the sign of the coefficients.

VECM with Optimal Lag, [Lags (2), Rank (1)]

The Business Confidence Index has positioned as the dependent variable. In this case, we are going to say, in the short run, the log of Gross National Income per capita and Sub-national Human Development Index do not cause business confidence of social entrepreneurs of Russia. The corresponding P-value is 0.004, and the coefficient of the cointegrating equation is negative, whose value is -.0462739. At the same time, the first and second lagged values of the First Difference of the Business Confidence Index influence the target variable, Business Confidence Index, at the 1 % significance level in the short-run. The P-value of the cointegrating equation is statistically significant in the short run at the 1 % significant level.

In the long-run, the log of Gross National Income per capita has a positive (sign is negative), whose coefficient value is -1.109623, effect on the target variable, Business Confidence Index, at the 1 % significant level. The Sub-national Human Development index has a negative (sign is positive), whose coefficient value is 90.09402, effect on the target variable, Business Confidence Index. The coefficient is statistically significant at the 1 % level. In the long-run, the cointegrating equation shows the corresponding P-value of the log of Gross National Income per capita, which is 0.000, and the Sub-national Human Development index, which is 0.000.

In the long-run, the log of Gross National Income per capita and Sub-national Human Development index have asymmetric effects on Business Confidence Index on average ceteris paribus. Even in two lags, there is no autocorrelation, where the P-value of the first lag is 0.72879, and the second lag is 0.60098.

The cointegrating equation and long-run model is $\mathbf{ECT_{t-1}} = [\mathbf{Y_{t-1}} - \boldsymbol{\eta_1}\mathbf{X_{t-1}} - \boldsymbol{\xi_1}\mathbf{R_{t-1}}]$.

$$\mathbf{ECT_{t-1}} = [\mathbf{1.000}\mathit{buscndx}_{t-1} - \mathbf{1.109623}\mathit{lngnipc}_{t-1} + \mathbf{90.09402}\ \mathit{subnhdi}_{t-1} - \mathbf{145.3439}].$$

$$\Delta\mathbf{Y_t} = \boldsymbol{\sigma} + \sum_{i=1}^{k-1}\boldsymbol{\gamma_i}\,\Delta\mathbf{Y_{t-i}} + \sum_{j=1}^{k-1}\boldsymbol{\eta_j}\,\Delta\mathbf{X_{t-j}} + \sum_{m=1}^{k-1}\boldsymbol{\xi_m}\,\Delta\mathbf{R_{t-m}} + \boldsymbol{\lambda}\mathbf{ECT_{t-1}} + \mathbf{u_t}$$

Business Confidence Index as the target variable:

$$\Delta\mathit{buscndx}_t = 0.0229058 + 1.269319\Delta\mathit{buscndx}_{t-i}(\mathbf{L1}) - 0.5200699\Delta\mathit{buscndx}_{t-i}(\mathbf{L2})$$
$$- 0.0906008\Delta\mathit{lngnipc}_{t-1}(\mathbf{L1}) + 0.0364652\ \Delta\mathit{lngnipc}_{t-1}(\mathbf{L2})$$
$$+ 16.31807\Delta\mathit{subnhdi}_{t-1}(\mathbf{L1}) + 9.929775\Delta\mathit{subnhdi}_{t-1}(\mathbf{L2}) - 0.1881318\mathbf{ECT_{t-1}}$$

The adjustment term (-0.0462739) is statistically significant at the 1 % level, suggesting that the previous year's errors or deviation from long-run equilibrium are corrected for within the current year at a convergence speed of 4.63 %.

Fig. 2: Stability of the model of BUSCNDX, LNGNIPC, and SUBNHDI
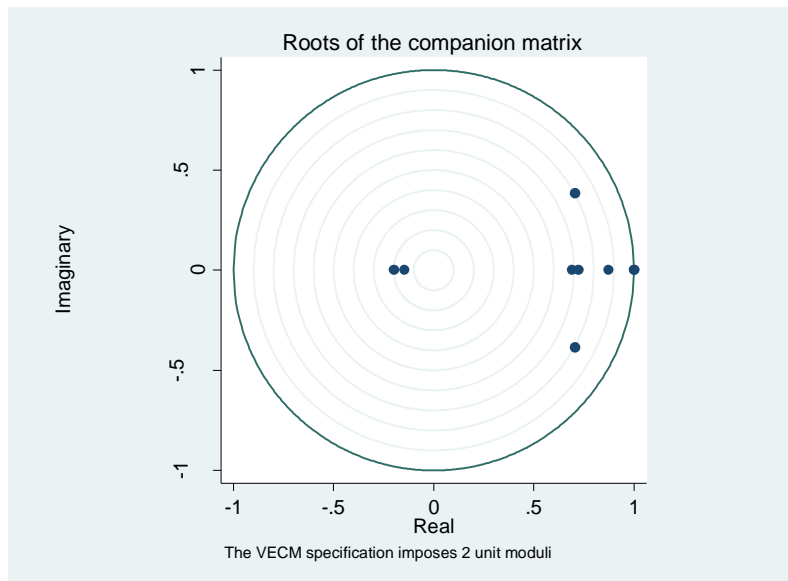
Source: Author's Calculation, STATA.

Figure (2) shows the VECM specification imposes 2-unit moduli, which is better for the model. All values are placing inside the circle. We conclude that we can rely on this model to determine the short-run and long-run relationship between social business entrepreneurship and their business freedom considering Business Confidence Index, Sub-national Human Development Index, and Gross National Income per capita of the Russian Federation.

3.7 Pairwise Granger CausalityTest

Tab. 6: Pairwise Granger CausalityTest

Pairwise Granger Causality Tests			
Sample: 1995Q1 2018Q4			
Lags: 2			
Null Hypothesis:	Observations	F-Statistic	Prob.
Log of Gross National Income per capita causes Granger Cause Business Confidence Index	94	4.85989	0.0099
Business Confidence Index does not Granger Cause Log of Gross National Income per capita		1.23649	0.2953
Sub-national Human Development Index does not Granger Cause Business Confidence Index	94	1.83276	0.1660
Business Confidence Index does not Granger Cause Sub-national Human Development Index		1.19413	0.3078
Sub-national Human Development Index does not Granger Cause Log of Gross National Income per capita	94	0.53139	0.5896
Log of Gross National Income per capita does not Granger Cause Sub-National Human Development Index		0.00593	0.9941

Source: Author's Calculation, EVIEWS.

Conclusion

However, Social Business Entrepreneurship (SBE), a non-loss and non-dividend business, helps the citizens by addressing the created problems of the people in the country, like the Russian Federation. An individual determines the profit of the Social Business reinvesting the initial investment and its earnings in the business. Social Business Entrepreneurship invest money many times as far as possible to generate more and more financial benefits or values. The person who is known as Social Business Entrepreneur deals with Social Business Entrepreneurial activities meeting social objectives. However, there is no short-run relationship between Social Business Entrepreneurship and Business Confidence Index. The log Gross National Income per capita and subnational human development index do not have any short-run assassination with business confidence index of the social business entrepreneurship. In short run, there is no impact due to economic stability and private and public sector funding opportunity to social business entrepreneurship.

However, in the long-run, Gross National Income per capita and subnational human development impact business confidence of social entrepreneurship of the Russian Federation. At present, a growing number of studies indicate the Russian Federation has experienced a stable stage because of the hostile business nature. Researchers have discovered the impact of entrepreneurial behavior is surprisingly little because of the knowledge gap.

Researchers notice Social business or enterprise introduces the capital accumulation of entrepreneurship. Researchers, entrepreneurs, and policymakers have determined Social

Business Entrepreneurship brings a better transformation of the economic position through restructuring socio-economic infrastructure. They notice Social Business Entrepreneurship invest capital engaging in innovations through business operations with social objectives.

Existing pieces of literature show Social Business Entrepreneurship increases the value for the people by creating innovative ideas, exploring new opportunities, doing something for raising the social benefits, dealing with the accountability, ensuring the use of available resources wisely, and acting as a volunteer at a not-for-profit sector. Young researchers have noticed Social Business Entrepreneurship engages in business activities by considering a positive return to the community, transforming systems, practicing and analyzing the primary causes of poverty, marginalization, the deterioration of the environment, and dealing with the loss of the dignity of humans.

This research manifests a similar statement to previous researchers. Our study shows how the Social Business Entrepreneurial capital impacts the knowledge that needs to create the capabilities for entrepreneurial activities associating with institutional, legal, environmental, and social factors. Our study has the same conclusion as other researchers have that Business Entrepreneurship explains the regional economy of the country through operating business with social objectives. Social Business Entrepreneurship generates profits and solves social problems as well at the same time. We are keenly interested in exploring the impact of macroeconomic factors on innovation and social business entrepreneurship.

Acknowledgement

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KEY SUCCESS FACTORS OF THE CROWDSOURCING PLATFORMS FOR INNOVATION

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Abstract

Purpose: Due to information technology rapid development, the possibility arises to include different ideas and inputs from a large number of people in value creation throughout the innovation process. In this regard, the key success factors (in the form of attributes) of crowdsourcing platforms for innovation can be observed as the main goal of the paper.

Design/methodology/approach: The research is conducted in two phases. The first one was oriented towards literature review on crowdsourcing platforms and their attributes, and the second, towards selection and investigation of the platforms. The review was realized through Google Scholar's advanced search based on predefined keywords. Within the resulted search, we chose those papers concerning platforms' attributes. Analyzing these papers, we extracted the attributes for further research. The second phase represents the selection of platforms, which is based on the frequency of their appearance in relevant research and persistence over time. The investigation of various platforms is presently performed through direct analysis of each individual platform in terms of search and recognition of previously defined attribute values.

Findings: The results of the review based on the identified design elements (attributes) may well serve as an initial knowledge base of crowdsourcing platforms since it contains featured values for every predefined platform element.

Research/practical implications: It is quite possible to assume that our knowledge base can support different companies in their innovation processes management, giving the foundation for creating new concepts of communication and collaboration. Most certainly, future research should be oriented towards recognizing additional attributes and, obviously, towards examining a larger number of platforms.

Originality/value: The presented paper makes a positive contribution to the widely present topic in the innovation management field concerning the role of online platforms, especially those related to crowdsourcing for innovation.

Keywords: crowdsourcing platforms, open innovation, innovation community, intellectual property

JEL Codes: 031, 034, 036

Introduction

Till recently, "crowd" as the term was used to describe self-organized groups gathered together with a common purpose, experience or emotion. With technological advancement, the crowd started to be more accessible and perceived as the group of people who can be used in developing solutions for business purposes. In line with this, the crowdsourcing phenomenon appeared with the idea to facilitate access to a large pool of ideas and solutions. The companies are using this approach to leverage some issues which cannot be solved internally.

Crowdsourcing can be observed as a mode of open innovation, and it can be applied in various fields across different industries. Powered by new technologies, it started to be the most frequently used in a form of IT-based tools, meaning crowdsourcing platforms. These platforms are, also, known as systems for collective intelligence (Malone et al., 2010) and open innovation platforms, when speaking of crowdsourcing innovation. Lower development cost, faster development, access to a large knowledge pool, a lot of ideas, communication and collaboration with the innovation community, are just some of the advantages in using crowdsourcing platforms.

Different typologies of these platforms can be found in the literature and practice. Hallerstede (2013) in his work emphasizes five types – *Innovation contest* (web-based competition which assume, on one side, seeker companies that propose the challenges and, on the other, solvers (crowd) who are trying to suggest the solution for the challenges), *Innovation marketplace* (intermediary platforms that enable seeker companies to post challenges to which crowd can suggest solutions), *Innovation community* (companies are engaging group of people who share same interest), *Innovation toolkits* (virtual environment which enables crowd to generate innovative ideas and solutions) and *Innovation technologies* (support the process of implementing ideas). Additionally, an interesting classification is proposed by Schenk, Guittard, and Pénin (2017) based on whether the company should develop its own platform (for example Dell IdeaStorm) or use an open intermediary platform (for example InnoCentive) – *proprietary* or *open* platforms (also recognized as *internal*/*external* platforms, or *single-seeker*/*multi-seeker* platforms) (Schenk et al., 2017).

An important question concerning the successful use of crowdsourcing platforms is related to recognizing and defining all necessary rules and policies to fairly protect both, the company and crowd, especially in the field of intellectual property (Brabham, 2013). These policies should be precise and easy to understand by all parties (de Beer et al., 2017).

Starting from this point, the paper is organized in two main sections, first related to the overall crowdsourcing platform design, describing the main platform elements. This section includes two subsections that explain the importance of innovation community and motivation and the issue of the exceptionally important intellectual property protection. The second section is related to the review of different crowdsourcing platforms based on identified attributes.

1. A crowdsourcing platform design

Crowdsourcing platform represents a socio-technical system aimed at transforming accepted innovative solutions into corresponding products or services and their commercialization. The social point of view implies the participation of the innovation community. From the technical point of view, these platforms represent infrastructure for information exchange. They require suitable hardware (servers), software and services (internet connection) (Hallerstede, 2013; Milutinović et al., 2018).

Many organizations still have problems when implementing and using crowdsourcing platforms, since the open process makes it difficult to ensure quality and quantity of innovation outcome; it is hard to provide a critical mass to take part in the process; it is difficult to identify appropriate business model, etc.

Having this in mind, Kohler and Chesbrough (2019) suggest four building blocks of the crowdsource platform design – (1) *value unit*, (2) *actors*, (3) *interactions* and (4) *business model*. *Value unit* block represents the starting point describing the outcome of the crowdsourcing process (idea, design, product, etc.). Crowdsourcing platforms are multi-sided platforms that include three main *actors*: *organization* (infrastructure, tools, rules and other supporting means that facilitate the interaction between actors – also known as *seeker*), *creators* (often called *solvers*) and *consumers* (use the solution) (Kohler & Chesbrough, 2019). *The interaction block* considers activities from creating candidate value units by the innovation community, followed by ensuring the quality and quantity of the values chosen for development, to the consumption of the developed value unit. *Business models* imply choosing the way a company creates and captures value over the platform using one of three types: *integrated platform*, *product platform*, and *two-sided platform model* (see Kohler & Chesbrough, 2019). According to them, managing these building blocks enables the success of the crowdsourcing platform.

Malone, Laubacher, and Dellarocas (2010) in their paper describe the crowdsourcing platforms design (they use the term system of collective intelligence) by asking questions such as *What is being done? Who is doing it? Why are they doing it? and How is it being done?*. It

can be seen that the answers to these questions might be connected to the four building blocks from Kohler and Chesbrough (2019).

Unlike previous interpretations of platforms design, Bullinger & Moeslein (2010) discerned the framework of ten key crowdsourcing platforms design attributes - Issue specification, Degree of elaboration, Media, Target group, Organizer, Number of persons participating, Incentives for participation, Runtime, Tool for interaction and Evaluation. All of these attributes can take value from the defined pool (see Bullinger & Moeslein, 2010). In using the crowdsourcing platforms, besides the issues of the problem specification, solution complexity, degree of elaboration, it is significant to underline how important are questions of social aspect - innovation community, and intellectual property rights protection.

1.1   Innovation community and motivation

As the aforesaid, crowdsourcing represents a problem-solving model which implies approaching a large number of people with a request to propose the contributions to a variety of business challenges. The main advantage of using the crowd is that companies (seekers) can benefit from a large pool of potential contributors coming from all over the world (Schenk et al., 2017). In addition, engaging the crowd or online community in different online activities enables attaining cost savings. More precisely, taking on the innovation community to acquire the solutions for defined business challenges generates lower costs than trying to carry out complete ideation and develop innovative solutions inside the company (Poetz & Schreier, 2012). The seekers are trying to leverage common interests and needs which are usual for the community. There is a lot of research conducted in this field (Figure 1).

Fig. 1: Example of innovation community research

| Lead users - People sharing the same interest and passion (inventing new products and solutions together) | Loyal customers that supply a company with suggestions for product improvement | Anonymous people asked to contribute to business challenge proposed by the company usually in the form of contest | People invited to contribute to a collective innovation projects | ... |

Source: Adapted from (Chanal & Caron-Fasan, 2010).

When speaking of applying open innovation by means of including the innovation community into the innovation process, it is confirmed that this can be done in different scope and intensity. Regarding the scope, the seeker organizations may use the community in various stages of the innovation process (even in all of them, for example, Quirky). The intensity means that seekers may (or may not) rely solely on the community ideas and solutions (for example Threadless). In this variety of crowdsourcing applications, it is possible for a community to

affect an overall innovation project, starting from the idea generation to concept design, product design, testing phase, etc.

Evidently, it should be emphasized how important is to identify and motivate possible entrants to contribute to the process. The success of a crowdsourcing platform intensively depends on its participants´ motivation, which can affect the quality and the number of contributions. In general, motivation can be intrinsic and extrinsic (Deci & Ryan, 2000). The first one rises from activities which are interesting and enjoyable. On the other hand, extrinsic motivation refers to doing an activity to obtain an external goal. When speaking of extrinsic motivation, research shows that it can be further classified into three groups: *financial* (cash, revenue, job opportunities), *social* (collaboration, experience, knowledge) and *organizational* (career development, recruitment). The intrinsic motivation cannot be classified further as it originates from a particular task itself (Hossain, 2012). Aitamurto and Saldivar (2017) in their research on motivating a large number of participants in crowdsourced policymaking also identified the following motivation factors: voluntary and paid crowdsourcing, commons-based peer production, political participation, knowledge perspectives. In other words, the main idea is to combine different factors (depending on the application domain) which can result in increasing participants' activity in the sense of contributions.

1.2   The issue of intellectual property rights

There are diverse legal aspects of crowdsourcing (tax, investment, and employment law), but this paper is concerned about the intellectual property issues that arise in the crowdsourcing process itself. The question of intellectual property rights is of great significance in any context of innovation, especially, in view of open innovation. If the companies want to leverage the crowd in a safe and sound manner, it is crucial for them to understand the legal considerations about the ownership of the proposed intellectual property. Since crowdsourcing platforms are, usually, in the form of a web site and feature user-generated content, it is obligatory for them to have in place terms of use and other policies. This enables both sides, seekers, and solvers, to be protected (Brabham, 2013). Having in mind that the employment law does not work for the crowd, seeker organizations must integrate plans for obtaining permission from rights owners to use the content (de Beer et al., 2017). The owners of crowdsourcing platforms must be aware of these issues before they ignite the crowdsourcing process.

The platform InnoCentive might be a good example of handling intellectual property rights on the site. Both sides (*seekers* and *solvers*) are signing a legal agreement which, to individuals, enables to propose the solution to defined problems and, to company, enables

temporary use of the proposed solution (Brabham, 2013). If the platform wants to be successful, it must include every aspect to secure data and new ideas that go digital (Figure 2).

Fig. 2: Intellectual property rights and data security on crowdsourcing platforms
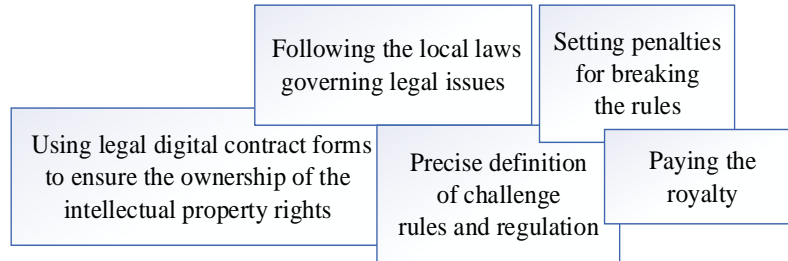
Source: Adapted from (Chatterjee et al., 2014).

Thus crowdsourcing can be interpreted as an agreement between seeker and solver, which establishes the fixed nature of the agreement in the form of contractual terms and conditions. De Beer et al., (2017) in their paper present a framework for managing intellectual property when crowdsourcing. The framework is built on two dimensions – *acquiring rights* and *limiting liabilities*, that form four approaches to intellectual property when crowdsourcing – *possessive*, *persuasive*, *passive* and *prudent* (Table 1). The first dimension explains how intellectual property rights can be acquired (ownership of the submitted solutions). The second one explains if the content in the proposed solution encompasses some unauthorized section from the third party – so-called "intellectual property contamination".

Tab. 1: Legal approaches to crowdsourcing intellectual property

	Possessive	Persuasive	Passive	Prudent
Acquiring rights (↑ - high, ↓ - low)	↑	↑	↓	↓
Limiting liabilities (↑ - high, ↓ - low)	↓	↑	↓	↑

Source: Adapted from (de Beer et al., 2017).

With the technological leap forward, the intellectual capital requires increasing protection, which justifies the application of blockchain (which happens to be one more dimension of nowadays context) for making the intellectual property more secure (Gürkaynak et al., 2018). Having in mind the risk that goes with the openness of the crowdsourcing process, lately, crowdsourcing platforms started integrating blockchain technology in order to enhance the security of proposed solutions and effective protection of intellectual property for both sides (Niu et al., 2019).

2.   Crowdsourcing platforms review based on predefined attributes

In this section, we give a review of different crowdsourcing platforms for innovation based on the predefined attributes and their values (Table 2). There are numbered articles dealing with the topic of open innovation platforms generally (Adamczyk et al., 2012; Bullinger et al., 2010; Bullinger & Moeslein, 2010; Di Gangi & Wasko, 2009; Füller et al., 2004; Haller et al., 2011; Hallerstede, 2013; Neyer et al., 2009; Stoetzel & Amberg, 2011). More specifically, some of these papers are dealing with design elements of the platforms, giving various kinds of reviews. For the purpose of this study, we have performed research based on selected keywords: crowdsourcing platforms for innovation and open innovation platforms and identified relevant articles used in the paper. For instance, by typing *open innovation platform* in Google scholars' advanced search, it can be found 68 references, containing this keyword within the title, which were published from 2010 till today.

Out of discovered articles we have extracted those concerning design elements throughout complete contents, where we noted that the majority of the papers included results of the research conducted by Bullinger & Moeslein (2010). This is why we considered this paper as a relevant source for the design elements selection. On behalf of this approach goes the fact that mentioned authors performed the analysis based on 33 relevant publications and 57 platforms.

Additionally, we selected studies that can be assumed as complementary, since the intellectual property and type of platform ownership can be considered as very important questions within the topic. Consequently, these questions are included as two new attributes (de Beer et al., 2017; Schenk et al., 2017). Starting with these presumptions, we have selected platforms from different sources (literature and Internet), based on the frequency of their appearance in relevant research and, by all means, their persistence over time. We focused our selection according to the frequency of the platform appearance in the previously identified relevant sources and its free internet accessibility. The design elements' values have been assessed in two ways: (1) if the platform was freely accessible, we have visited the website in order to determine the certain design element value and (2) if this was not the case (usually the case of finished innovation contests), we determined the value based on aforesaid relevant sources.

Tab. 2: The review of crowdsourcing platforms based on predefined attributes

Innovation platforms	Design elements/attributes									
	Type	Tool for interaction	Evaluation	Topic specificity	Target group	Degree of elaboration	Organizer	Motivation	Runtime	Approach to managing intellectual property
InnoCentive	O	IM	JE	H	S	So	Com, PO, NP	Mix	Lo	CA
Yet2.com	O	IM	JE	H	S	So	Com, PO, NP	Mix	Lo	CA
P&G Connect + Develop	P	ICm	JE	L, D	S, UnS	I, C, P, So	Com	Mon	Lo	Prud
NineSights by NineSigma	O	IM	JE	H	S, UnS	Sc	Com, PO, NP	Mix	Lo	CA
Quirky	P	IC	PR, JE	L	S, UnS	I, C, P, S	Com	Mon	Sh, Lo	Pers
Threadless	P	IC	PR	L	UnS	I, Sk	Com	Mon	Sh	Pass
Miadidas	P	IT	SA	L	UnS	I	Com	NMon	Sh	Pass
Lego Ideas	P	IC, ICm	PR	L	S	I, So	Com	Mix	Lo	Prud
Doritos: Crash the Superbowl	P	ICm	PR	D	UnS	So	Com	Mon	Sh	Pers
Shell GameChanger	P	IC	JE	H	S	C	Com	Mon	Lo	Prud
Nokia Open Innovation Challenge 2019	P	IC	JE	D	S	I, C	Com	Mon	Sh	Prud
Innoget	O	IM	JE	H	S	So	Com, PO, NP	Mix	Lo	Pers
Microsoft Imagine Cup	P	IC	PR, JE	H	S	C, So	Com	Mon	Lo	Pru
Ben & Jerry Suggest a Flavor	P	IC, ICm	JE	H	UnS	I	Com	NM	Lo	Poss
Legend	**Type**: Proprietary – P, Open – O; **Tool for interaction**: Innovation marketplace – IM, Innovation community – ICm, Innovation contest – IC, Innovation toolkit – IT; **Evaluation**: Jury evaluation – JE, Peer review – PR, Self-assessment – SA; **Topic specificity**: Low – L, Defined – D, High – H; **Target group**: Specified – S, Unspecified – UnS; **Degree of elaboration**: Idea – I, Sketch – Sk, Concept – C, Prototype – P, Solution – So; **Organizer**: Company – Com; Public organization – PO, Non-profit – NP, Individual – I; **Motivation**: Monetary – Mon, Non-monetary – NMon, Mixed – Mix; Runtime: Shirt – Sh, Long – Lo, Very long – VL; **Approach to IP management**: Passive – Pass, Persuasive – Pers, Possessive – Poss, Prudent – Prud, Customized approach – CA.									

Source: The table represents the initial investigation conducted by the Authors through direct analysis of each individual platform in terms of search and recognition of previously defined attribute values.

Regarding the attribute *type*, platforms can be open and proprietary. Proprietary platforms are common for those companies which have a strong brand or large crowd or internal capabilities (Schenk et al., 2017) (for example Nokia). The *type of approach to managing intellectual property* is investigated through terms of use offered on each platform. In some situations, the approach can be customized, meaning that it depends on the seeker organization. This is usually the case when companies use open platforms (for example NineSights). When it comes to *topic specification* (low, defined and high), it depends whether the company specifies concrete problems on their platforms or gives the possibility, to solvers, to freely

submit ideas (not related to proposed problems) (for example, P&G). The *degree of elaboration* ranges from idea to complete solution (for example, Threadless is in quest of ideas and sketches).

It should be noticed that the proposed overview might expect certain limitations, having in mind that assigned attribute values are based on interpreting the available data on the crowdsourcing platforms' web sites.

Conclusion

Since the crowdsourcing platforms can serve as a tool for reaching both economic and intellectual benefits, companies should be very careful when taking into account factors that influence the success in applying this kind of collective intelligence. This also means that companies should reassess their internal capabilities and recognize the problems they cannot solve so they can offer those problems to the crowd (this approach depends on the strategy of the company). It is, also, important to notice that every party in crowdsourcing requires appropriate intellectual property management (precise definition of the rules, terms, and conditions).

Given list of the identified crowdsourcing platforms (Table 2) may be observed as the initial source of information with the growing potential, for both organizations (seekers) and crowd (solvers). Seekers may use it for benchmarking since it provides the values of the recognized platform attributes. Solvers should use the base with the purpose to view some of the values they need (motivation, degree of elaboration, evaluation, etc.). Future research should be oriented towards increasing the pool of platforms and corresponding attributes examined.

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INTERNATIONALIZATION OF CLEANTECH FIRMS

Michael Neubert

Abstract

Purpose: The purpose of this multiple-case study is to explore the perceptions of the founders and senior executive managers of CleanTech firms about the internationalization behavior of these firms using the establishment chains of the Uppsala internationalization process model (UIPM) as conceptual framework.

Design/methodology/approach: The research design is based on the purpose of this study. This study uses a multiple-case study research design to get a better understanding about the internationalization behavior of CleanTech firms. Data was collected through six video-telephonic, semi-structured interviews of subject-matter experts and corporate documents to allow for triangulation. Thematic analysis and a critical event analysis approach revealed four themes to answer the research question.

Findings: The findings suggest that CleanTech firms seem to prefer an incremental internationalization process and show a prudent internationalization behavior: (1) German CleanTech firms prefer to penetrate their home market first before considering internationalization. (2) The CleanTech firms use export market entry forms to enter neighboring markets. (3) The management teams seem to have little experience and expertise in the development and execution of international strategies. The two main limitations sample size and methodology limit the generalizability of the results.

Research/practical implications: The results of this multiple-case study bestow major significance toward practice. Investors like government funds, business angels, and venture capitalists need to understand when a CleanTech firm has the potential for internationalization. Founders and managers need the respective knowledge, experience, and resources, as do coaches working at accelerators and incubators to support these CleanTech firms in the design and the execution of their international strategies.

Originality/value: This study contributes to the international entrepreneurship literature by illustrating the internationalization process and internationalization behavior of firms operating in the CleanTech industry.

Keywords: CleanTech, renewable energy, sustainability, Uppsala model, export

JEL Codes: M16, M13, L26

Introduction

CleanTech firms receive increasing interest from private and public investors (Doblinger, Surana, & Anadon, 2019). Due to the limited size of their home market and the public support (e.g., funding, coaching), they should internationalize early and fast after the development of their minimal viable products, to become profitable and large enough to compete successfully with their international counterparts (Neubert, 2017). Therefore, it is necessary to better understand the internationalization behavior, the internationalization patterns and the processes of these CleanTech firms and how they differ from other high-tech firms (Asemokha, Ahi, Torkkeli, & Saarenketo, 2019) from other countries (Neubert, 2017; Neubert & Van der Krogt, 2018).

The purpose of this multiple-case study is to explore the perceptions, views, and opinions of the founders and senior executive managers of CleanTech firms about the internationalization processes and behavior of their companies using the establishment chains of the Uppsala internationalization process model (UIPM) (Vahlne & Johanson, 2017; Neubert, 2018) as conceptual framework. This study follows a call for research from Neubert and Van der Krogt (2018) to study the internationalization behavior and processes of high-tech firms from other industries and countries and two calls of research from Perényi, Á. & Losoncz, M. (2018) about the internationalization of social entrepreneurs and sustainable firms like for example from the CleanTech industry, and how and why young firms internationalize.

This paper is structured as follows: After this introduction, the literature review covers the most recent papers about the internationalization of CleanTech firms and the conceptual framework used in this study. The third chapter presents the nature of the study. This includes the research methodology, the sampling strategy and the sample description, the research question, as well as data collection and analysis methods. The results are discussed in the fourth chapter. This paper will conclude with a list of key findings, an analysis of the impact of the research results for academics, policymakers, and practitioners, as well as recommendations for further research.

1.   Literature Review and Conceptual Framework

The purpose of the multiple-case study is to explore the perceptions, views, and opinions of the founders and senior executive managers of CleanTech firms regarding the internationalization processes and behavior of these firms. This takes place as a conceptual framework by using the market distance and the market commitment establishment chains (Neubert, 2018) of the Uppsala internationalization process model (UIPM) (Vahlne & Johanson, 2017).

The UIPM distinguishes two establishment chains (Vahlne & Johanson, 2017). The market distance establishment chain describes an incremental market development process (see Table 1). CleanTech firms are expected to enter incrementally into new foreign markets depending on the lowest cultural, administrative, geographical, and economic distance between their home and the target market or the highest country familiarity (Clark, Li & Shepherd, 2018). As the CleanTech firms of our sample are all based in the Germany, the first market entries might be expected in the same free-trade area, thus the European Union.

Table 1: Establishment Chains of the UIPM as Theoretical Framework

Establishment Chains		Market Commitment	
		Low	High
Market Distance	Low	Low risk market entry mode (e.g., export) to neighboring countries (e.g., EU)	High risk market entry mode (e.g., wholly-owned subsidiary) to neighboring countries
	High	Low risk market entry mode to far away countries (e.g., China)	High risk market entry mode to far away countries

Source: Author.

The market commitment establishment chain shows that CleanTech firms are expected to enter new foreign markets with low risk market entry forms, for example, with different export modes (see Table 1). With increasing market knowledge and relationship development (Vahlne & Johanson, 2020; Vahlne & Bhatti, 2019), the CleanTech firms are expected to dedicate additional resources to this market (e.g., establish a branch office or a wholly-owned subsidiary) based on a decreasing liability of foreignness and outsidership as well as a better understanding about how to transfer their firm-specific advantages to this market (Neubert & Van Der Krogt, 2017; Neubert, 2017). This networking and learning ability drives the speed of internationalization (Neubert & Van der Krogt, 2018; Yamin & Kurt, 2018) depending on the level of digitalization of international decision-making processes as well as the international experience and expertise of the entrepreneur (Neubert, 2018; Coviello, Kano, & Liesch, 2017).

Besides the establishment chains of the UIPM, high-tech firms in their early stages of internationalization might also show uneven and discontinuous internationalization patterns (Kriz & Welch, 2018) or use different internationalization strategies (e.g., an opportunity-based market entry strategy (Neubert & Van der Krogt, 2020), or the Born Global or Lean Global Start-up model (Monaghan, Tippmann, & Coviello, 2020; Neubert, 2018; 2017). This occurs

especially when they are from small and open economies (SMOPECs) (Neubert, 2018). As Germany can't be considered as a SMOPEC, this study uses only the conceptual framework of the UIPM.

Methodology

The purpose of this multiple-case study is to explore the perceptions, views, and opinions of the founders and senior executive managers of CleanTech firms as concerns the internationalization processes and behavior of their CleanTech firms. This study uses a multiple-case study research methodology to get a better understanding about this specific phenomenon and to explore new themes and relations between them (Yin, 2018).

The following research question is based on the purpose and the nature of this study:

What are the perceptions, opinions, and views of the founders and senior executive managers of CleanTech firms about how their CleanTech firms internationalize?

Our purposeful sampling approach sought to recruit one senior executive manager and founder of each of the six CleanTech firms, which have successfully completed an accelerator program funded by the European Institute of Innovation and Technology (EIT) in 2019 (https://eit.europa.eu/) (see Table 2). All CleanTech firms are university spin-offs, which participated in the accelerator program to develop their business models and products, to get funding, and to acquire their first clients. Thus, they are deeply embedded in their national ecosystems. The CleanTech firms are part of the CleanTech Industry and offer innovative products to manage electric power grids with different sources of energy, to collect data about traffic and air pollution, to recycle batteries, and to store energy.

Table 2: Case Study Firms

Number	1	2	3	4	5	6
Product	Software	Software	Sensors	Sensors	Batteries	Batteries
Industry	CleanTech					
Year of Incorporation	2017	2015	2016	2018	2014	2018
Background	University Spin-Off / Participant in CleanTech Accelerator Program					
Home Market	Germany					
Patents	No	No	No	No	Yes	Yes
Employees	28	23	8	6	12	5

Source: Author.

The six subject matter experts (SMEs) are all senior executive managers and founders of CleanTech firms with at least three years' experience as entrepreneurs. They hold university degrees in science and started their business ideas as university spin-offs. During the accelerator program, they developed the skills to manage a CleanTech firm successfully.

Data was gathered through a series of six video-telephonic, semi-structured interviews of senior managers and founders of CleanTech firms and through corporate documents such as business plans, strategic papers, product descriptions and client portfolios to allow for triangulation (Yin, 2018). Thematic analysis and a critical event analysis approach revealed seven themes to answer the research question (Yin, 2018).

2. Results

The thematic and critical event analysis revealed the following four themes to answer the research question about the perceptions, opinions, and views of the founders and senior executive managers of CleanTech firms about how their CleanTech firms internationalize.

Theme 1: CleanTech firms prefer to develop their home market first. Early and fast internationalization even within the European Union is not considered as an immediate strategic option.

All SMEs have a strong national business focus due to government regulations and processes, their access to public funding, and finally their integration in the national CleanTech ecosystem and network. With the exception of SME 1, all other SMEs still expect a sufficient market potential in their home market. According to SME 5, one reason is "piggyback export", i.e. often B2B clients integrate the software, the sensors, or the batteries in their own products and export them. SME 2 states that the high investments to make their software legally compliant even in other markets of the European Union, prevented them so far from going abroad. SME 3 and 4 also sell their sensors to the local municipalities in their home market, which is a very specific market (requiring detailed market knowledge and an excellent network) with a huge potential. SME 5 and 6 still see a high market potential in their home market for their energy storages and battery recycling process. They are both open to international opportunities, but they are not actively pursuing them.

Theme 2: If CleanTech firms internationalize, they focus on attractive markets within the European Union.

Two CleanTech firms in this sample have already developed new foreign markets. SME 1 stated that their foreign markets are in the European Union due to government regulation and national security issues. Especially the latter makes it quite challenging to sell their electric

power grid management software outside of the European Union. SME 5 acknowledges that they have an opportunity- or network-based approach. Besides their home market, they actively develop business opportunities in the European Union, but they are also open to requests for their energy storage systems from the rest of the world. The SMEs 2, 3, 4, and 6 are currently not planning to internationalize, but assume that they would focus on the European Union in the first phase of their internationalization.

Theme 3: CleanTech firms use export market entry forms to internationalize.

The statements of the SMEs suggest that they prefer export market entry forms. SME 1 and 5 state that they are using a combination of the market entry form "indirect export" with a distributor in each foreign market and "direct export" through the online store on their website. The other SMEs also use the market entry form "direct export" through the online store on their English website to give potential clients the possibility to contact and to purchase their products. SME 2 adds, that they occasionally receive requests from potential international B2B leads through their online shop, but due to market adaptation needs and compliance issues they carefully check whether they should consider a delivery. All SMEs state that they are also thinking about piggyback export, when approaching potential B2B clients in their home market.

Theme 4: The management of CleanTech firms has little experience and expertise in international entrepreneurship and management.

SME 1 recognizes that their management team has a limited international experience and expertise, even though they get great support from their coaches. SME 1 considers it as a learning-by-doing process or an incremental internationalization process. According to SME 5, their management team has some more experience and expertise in international business, but still lacks important competences (e.g., the sustainable acquisition of clients in foreign markets). SMEs 2, 3, 4, and 6 admit that they have little or no experience and expertise in designing and implementing an internationalization strategy. They acknowledge that the participation in international conferences, trade fairs, and seminars is interesting, but certainly not sufficient; and therefore prefer to use an incremental or step-by-step internationalization process.

Table 3: Internationalization Process of CleanTech Firms

Market Entry Form Region	Direct export (online / website)	Indirect export (distributors)	Piggyback export (home market clients)
Other EU markets depending on market opportunities and attractiveness	Passive: Answer requests from potential clients	Active: In attractive EU markets, they hire a local distributor.	Passive: Follow their existing B2B clients to new markets.

Source: Author.

The results of this multiple-case study suggest that CleanTech firms consider internationalization only as a strategic option after they have successfully developed their home market. Internationalization should start in the neighboring European Union markets using export market entry forms due to limited financial resources as well as limited international expertise and experience. This internationalization process and behavior seem to confirm the findings of the UIPM (Vahlne & Johanson, 2017). During the early stages of internationalization, the CleanTech firms in this sample prefer to enter neighboring markets in the European Union using low risk market entry forms (Vahlne & Johanson, 2017) (see Table 3) or in other words prefer to combine a low market commitment with a low market distance (see Table 2). This internationalization strategy might be considered as a "Regional Exporter" model, even though it is still unclear whether internationalization becomes a better option for the CleanTech firms in our sample as soon as their home market is saturated and whether they will increase their market commitment as soon as they have the first successes abroad. Finally, the findings also suggest that the SMEs are not planning to consider a born global or lean global start-up model (Monaghan et al., 2020; Neubert, 2018; 2017).

Conclusion

The purpose of this multiple-case study is to explore the perceptions, views, and opinions of the founders and senior executive managers of CleanTech firms concerning the internationalization processes and behavior of their CleanTech firms using the establishment chains of the UIPM as a conceptual framework. The findings suggest that CleanTech firms of this sample seem to prefer an incremental internationalization process and show a prudent internationalization behavior based on the following key results:

- Germany is not a SMOPEC, which forces the CleanTech firms in our sample to internationalize early and fast. Thus, they prefer to penetrate their home market first before considering internationalization.
- The CleanTech firms use export market entry forms to enter neighboring markets in the European Union. Therefore, they might be considered as a "Regional Exporters" (see Table 4).

Table 4: Establishment Chains of the UIPM as Theoretical Framework

Establishment Chains	Market Commitment	
	Low	High
Low Market Distance High	Low risk market entry mode (e.g., export) to neighboring countries (e.g., EU)	High risk market entry mode (e.g., wholly-owned subsidiary) to neighboring countries
	Low risk market entry mode to far away countries (e.g., China)	High risk market entry mode to far away countries

Source: Author.

- The management teams of almost all CleanTech firms in our sample seem to have little experience and expertise in the development and execution of international strategies. It needs further research to understand whether this is a reason for their prudent internationalization behavior or the market potential of their home market, or something else.

The results of this multiple-case study have a high significance for practice. Investors like government funds, business angels, and venture capitalists need to understand when a CleanTech firm has the potential for internationalization and therefore need to dedicate enough resources accordingly. Founders, entrepreneurs and managers need the respective knowledge, experience, and resources as do consultants and coaches working at accelerators and incubators to support these CleanTech firms in the development and the execution of their international strategies.

One limitation is based on the research methodology. Even though we believe that the results of this multiple-case study are worth further investigation, they cannot be generalized at this stage. The second limitation is based on the sample. Internationalization behavior and processes might differ depending on the industry, the management, and the home country. Thus, additional studies with corporate data from different countries and industries, and with different research methodologies are needed before results could be generalized.

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EVALUATING THE IMPACT OF INVESTMENT IN THE RESEARCH INFRASTRUCTURE ON THE LEVEL OF INNOVATION PROJECT

Tatyana Novikova

Abstract

Purpose: The scientific and technical development of Russia requires improvement in the methodology for the analysis of innovative projects. The overall objective of this paper is to assess the impact of research infrastructure projects .

Design/methodology/approach: The multi-period model of the research infrastructure project is used as the main assessment tool. This paper focuses on the problem of measuring the benefits and costs for research infrastructure projects and the corresponding impact on project efficiency and the efficiency of participation in projects.

Findings: An important part of the impact of research infrastructure projects is related to specific economic consequences of project, including indirect effects (embodied technological spillovers), externalities (knowledge spillovers and environmental effects), tax and price effects. A qualitative and quantitative analysis of these consequences is based on the transition from financial to economic efficiency and a comparison of changes in cash flows and corresponding net present values.

Research/practical implications: The proposed methods and models were adapted and tested for evaluation of the Core Facility Project "Catalyst Pilot Production" within the framework of the regional program "Novosibirsk Academic Town 2.0". An important feature of the project is an extremely high level of economic efficiency with indirect and tax effects as the main components. As a result of support, the financial net present value increases to a positive level, and a mutually advantageous combination of interests of various participants is ensured.

Originality/value: The proposed evaluation of research infrastructure projects with simultaneous financial and economic analysis provides the basis for assessing the impact both within such projects and beyond, as well as the justification of the need for government intervention for the successful implementation of such projects.

Keywords: economic efficiency, research infrastructure, core facility project

JEL Classification: G28, O3, O22

Introduction

Scientific and technological development in Russia and corresponding institutions for the coordination of activities between the representatives of science, education and business are being created on the basis of the partnership principle in the form of forming network infrastructures, core facilities, engineering centers, sharing unique scientific equipment, national and international mega-science facilities. Infrastructure component of this development requires a significant update of the methodology for assessment of relevant investment projects in the direction of combining financial and economic analysis with highlighting a variety of public effects (technological spillovers, knowledge synergistic, environmental, social, price, tax effects). The overall aim of this paper is to assess the impact of research infrastructure projects, using simultaneous assessment of the total values and the differences between financial and economic efficiency.

Project appraisal practice is now characterized by the dominance of approaches in accordance with financial project analysis, which compares direct costs and benefits, appeared on the market from the point of view of private participants. At the same time they miss the possibilities of the economic aspect of project analysis. The validity of narrow financial approach in this work is called into question. This does not mean a proposal to replace financial estimates with economic ones. The research problem of the paper is to clarify the significance of the simultaneous application of the financial and economic aspects of project analysis. In this paper, we discuss the relevant hypotheses about the boundaries of applying only financial or only economic project analysis, the validity of a detailed presentation of the difference in financial and economic efficiency by the main factors and corresponding public effects, as well as the potency of government intervention in solving the gap between the two types of efficiency.

The theoretical basis of the relevant methods was originally developed at the beginning of the twentieth century as part of cost-benefit analysis to evaluate public sector investment projects in developed countries. Economic analysis as a separate direction of project appraisal, supplementing financial analysis, formed from the middle of the last century in the context of solving development problems in international financial organizations: UNIDO (Dasgupta et al. (1972)), World Bank (Squire et al. (1975)). It reached the peak of application by the beginning of the 80s (Ward and Deren (1991), Belli et al. (1998)). They included an assessment of infrastructure projects as an important object. In most developed guidelines, the financial and economic aspects of project analysis were considered separately, while the indicators of

economic efficiency were calculated on the basis of modified methods of analysis of benefits and costs. However, in some guidelines, the transition from financial to economic analysis was used to determine economic efficiency. They calculated the corresponding social effects in accordance with the specific features of economic efficiency. Among them, we should single out the European Union guide, which was constantly updated in 2002, 2008 and 2014 (Guide to Cost-Benefit Analysis (2014)).

Project evaluation methods were again modified in the 90s for adaptation to the conditions of transition to a market in Russia and other former socialist countries. At the same time, the combination of two types of analysis began to be denoted by the concepts of commercial and public efficiency (Guidelines (2000)). Particular attention in this guide and in a number of scientific publications of its authors is given to the problem of government support for projects and comparison of performance indicators in conditions without support and with support. This corresponds to a whole line of research on government stimulation of investment activity, in particular, the implementation of innovative projects. An overview of the relevant approaches is given, for example, in the book Novikova (2018), chapters 5 and 11.

The consequences of government support are evaluated on the basis of two groups of methods: econometric and analytical. In the first group, statistical empirical studies of real changes arising as a result of government intervention are carried out. Such studies are most common when evaluating the effects of stimulating innovation. Among recent publications, an article of Dvouletý et al. (2020) stands out, which reviews studies investigating the effects of public grants on firm performance in the European Union's 28 member countries, especially concerning firm size and age, region, industry and intensity of support.

Traditional analytical approach focuses on the microeconomic interaction between the government and firms and analyzes the conditions for optimal subsidies for investments carried out by the private sector in comparison with the taxing corporate profits. For survey see, for example, Galai and Wiener (2003). The authors of this work also showed that high-risk ventures generating substantial spillover activity are prime candidates for government incentive schemes. Another group of analytical methods estimates changes in the cash flows of each project and corresponding performance indicators as a result of the provision of government support in the context of various support tools (Novikova (2018), ch.11). To do this, the authors consider a step-by-step transition from modeling the situation without support to situations with the consistent application of each new tool and quantifying the corresponding changes in the form of effects of this additional tool.

The spread of economic analysis methods can be represented in conjunction with the long-term crises as a stage of long waves, accompanied by widening of a gap between domestic and international markets. Until the end of the twentieth century, this economic approach was widely used both in theory and in practice. The reason for this was connected with significant distortions in the domestic markets (mainly in developing countries), especially during the long-term K-crises of the 70s and related import substitution processes. Later, the impact of these factors weakened and, respectively, the interest in their application declined. At the same time, the methods of economic analysis were criticized both within the development banks (Economic Analysis (1991)) and by external experts (Balassa (1976), Jenkins (1997)). At the same time, the public-private partnerships (PPP) began to develop. Initially, they were used to evaluate predominantly infrastructure projects based on financial analysis methods.

In the 21st century, at a new stage of scientific and technological development and realities of the fourth industrial revolution, the attention to the economic evaluation of projects has again intensified and led to the development of new economic assessment versions in government organizations, independent funds and international institutions: Structural Funds of the European Community (Guide to Cost-Benefit Analysis (2014)), European Investment Bank (Economic Appraisal (2013)), Asian Development Bank (Guidelines (2017)). At the same time, in a specialized PPP methodology, a combination of financial and economic analysis began to be used to a greater extent to assess infrastructure projects. In Russia, this mechanism is laid down in the latest "Methodology for assessing the efficiency of a public-private partnership projects or municipal-private partnership projects and determining their comparative advantage" (2015). It proposes to quantify only the financial and budgetary efficiency of infrastructure projects and to conduct only quantitative analysis of socio-economic efficiency instead of economic efficiency assessment. This causes serious objections, both from theoretical and practical points of view due to the lack of a comprehensive estimation of comparable indicators in monetary terms (typical of modern project analysis). In general, methods for assessing the efficiency of infrastructure projects are developing and taking into account new social and environmental priorities.

1. Methodology

1.1 Model objects

In this paper we discuss mainly the model of research infrastructure project as a basic instrument for research (Novikova (2018)). Such models were developed by the authors of the above methods of project analysis and were discussed in their respective scientific publications.

As a rule, they considered models of separate investment projects. The proposed model belongs to this group. It is a modification of the previously developed more general model of an innovative project. The modification takes into account the specifics of the research infrastructure projects. Main limitations of this approach are those that result from the availability of reliable and consistent data for a stand-alone project. In the case of large-scale projects, this model can be included in a complex of interconnected models, and the noted restriction is significantly relaxed. However, in this case, another type of methodological limitations arises, associated with the use of significantly more complicated models. The specified complex was developed in 2005-2018 in the Institute of Economics and Industrial Engineering of the Russian Academy of Sciences. In general, we use three interrelated models: the financial-economic model of investment project, the input-output multi-regional optimization model and the econometric model. An optimization input-output multi-regional model (OIMM) provides endogenous solutions at the macroeconomic, sectoral and regional levels (Granberg et al. (2007)), which are used for evaluating large projects (Mikheeva et al. (2011)). This model is elaborated in two versions (with or without the inclusion of the project in the original version) and is implemented in detailed single-period and small-sized multi-period versions. An econometric model is proposed for forecasting prices and sales volumes on global commodity markets (Gulakova (2018)). By combining these models, it is possible to analyze the development trends of the global, national and regional economy in conjunction with the presentation of investment processes at the microeconomic project level.

Since the project under consideration is relatively small and is characterized by basic indirect effects already in the first round of use, a separate model can be used for it. Among the closest studies, the model of large-scale research infrastructures projects developed by Florio and Sirtori (2016) should be highlighted. This model includes an extended range of social benefits which are typical for such projects and includes knowledge outputs, technological externalities, human capital development, wider cultural effects, services to third parties and the pure value of discovery. However, the separation of financial and economic benefits in this study is not carried out. The model proposed in this paper is characterized by a narrower set of benefits typical for relatively small research infrastructures projects, but is focused on the difference between the two aspects of the analysis.

In conditions of market failures, the main problem for the economic efficiency analysis is the revealing of the valid costs and benefits, their measurement and co-measurement in time. Factors determining the difference in financial and economic efficiency are associated with the identification of relevant benefits and costs. In order to analyze the economic efficiency of the

project, along with the private benefits and costs associated with financial efficiency, it is proposed to evaluate a number of specific effects, allowing to take into account the impact of the research infrastructure project on public welfare. The public effects of such projects can be grouped into eight groups: tax effects, indirect embodied technological spillovers, knowledge externalities, synergistic, environmental, social and price effects. When evaluating specific projects, the most significant effects for them are identified. The attention is focused on assessing the considered public effects with the help of certain economic and mathematical tools that are adequate for each group of effects. For the project considered in this article, the first four groups of effects were evaluated.

All investment projects can be subdivided into three basic groups depending on a combination of financial and economic efficiency. One group is formed by the typical projects of private sector and corresponds to a normal market level of a financial efficiency. The projects of public sector belong to other group with a high level of economic efficiency in a combination with low or even negative level of financial efficiency. Projects of the third, intermediate group are characterized by a combination of low financial and high economic efficiency, but they are carried out in a private sector. Most of the research infrastructure and innovative projects belongs to this group. For such projects there are serious obstacles to success, since the most important results of their implementation are not considered in traditional methods of financial evaluating. Our model is focused on the third group of projects including financial and economic evaluation of efficiency, considering distinction of approaches of private participants and society as a whole and using principles of PPP for the project realization.

The level of financial efficiency defines total size of efficiency of private participation in the project. Without any special support projects of the third group are unable to attract usual private investor. However their level of economic efficiency is so high that it forms the basis for different types of support. Government uses the whole system of support instruments including diverse tax advantages and exemptions, tax expenditures, subventions, government guarantees, budget credits with lower interest rates, investment in equity, infrastructure facilities construction. For successful realization of innovative projects, support is usually provided in the form of financing of the most risky researches by the government or the bank of development. Due to this support, financial efficiency increases to a level acceptable to private participants. Thus the government and the institute of development play a role of the specific participant which can influence the financial efficiency and bring it into accord with economic efficiency of projects.

1.2   Financial and economic components of the model

The multi-period model of research infrastructure project (MIP) consists of financial and economic parts which are based on appropriate financial and economic analysis and are characterized by a complexity of the applied model tools. An important feature of the model is the presentation of all parameters and indicators for several periods of time. Both the financial and economic parts of the model include evaluating the project efficiency and the efficiency of the participation in the project. The latter means the comparison of benefits and costs that arise for every participant after realization of the project.

Financial MIP is typical for project evaluation in private sector and reflects interrelationships between variables, assumptions and business drivers in the process of project realization. It has identical structure and includes the following components:

1. Initial projections: sales, volumes of production, liquidation value, investments, amortization and fixed capital, current costs, working capital, taxes, financing;

2. Cash flow forecasts, including cash flow of the project (a cash flow from operational and investment activity), cash flow for financial planning (a cash flow from operational, investment and financial activity), cash flow for the government, cash flows for private investors;

3. Financial forecasts of the income statement and the balance sheet;

4. Indicators of efficiency of the project and efficiency of participation in the project on the basis of corresponding cash flows. The basic indicator of financial efficiency of the project is the net present value (NPV_F) which is defined on the basis of the corresponding benefits B_t and costs C_t in the context of a financial efficiency analysis for each moment of time t and the discount rate d.

The proposed system of interconnected parts of the financial model allows for in-depth analysis and justification of management recommendations for **financing** research infrastructure **projects** .

Economic MIP is based on the transition from financial to economic efficiency by means of correcting of the discount rate and cash flows for different factors and related public effects listed above.

We use the standard formula for the calculation of the net present value within the framework of economic efficiency of the project (NPV_E) and focus on the difference between financial and economic cash flows in the following identity:

$$NPV_E = \sum_{t=1}^{T} \frac{CFF^t + \sum_{f=1}^{F} \Delta^{ft}}{d - \Delta^d} , \qquad (1)$$

where Δ^{ft} is the difference of financial and economic efficiency for each moment of time t ($t=1$, ..., T) and each factor and corresponding public effect f ($f=1$, ..., F); $d - \Delta^d$ is the social (economic) discount rate.

Mechanisms of project realization are based on the interrelation of cash flows. Cash flows of the project describe activity of its realization irrespective of sources of expenditures financing and redistribution of revenues between various participants. But for the realization of each project, the problem of its financing and corresponding redistribution of the results is very important. The same is valid for the problem of the efficiency of the participation in the project. The basis of its solution can be presented by the following equation that describes interaction of various participants of the project in the form of interrelation of their cash flows and efficiency indicators, first of all net present values:

$$NPV_K = \sum_s NPV_K^S , \qquad (2)$$

where NPV_K ($K=F,E$) is net present value of the project which is equal to NPV_F within the framework of financial or NPV_E within the framework of economic efficiency analysis, NPV_K^S is net present value of the s-th participant of the project (NPV_F^s or NPV_E^s, respectively).

The NPV of the efficient project can be considered as original "pie" which is divided in different ways between participants of the project by means of every special mechanism of project realization, first of all its financing. It provides sources for corresponding efficiency of participation in the project. A significant positive size of the NPV for every participant of the project would show that this mechanism is interesting for participants and leads to successful realization of the project.

2.　Results of efficiency evaluation for real projects

Based on the developed methods and models, an assessment of the financial and economic efficiency of two real projects of various types was obtained: a research infrastructure project of Core Facility "Catalyst Pilot Production" as a part of the regional program "Novosibirsk Academic Town 2.0" (CPP) and a project for the construction of the ESPO-2 pipeline (Gulakova (2018)).

The example of these projects shows how the degree of details and methods for calculating individual effects for infrastructure projects of various types differ. The project of catalysts is characterized by the main effects already at the first stage of use, and for it indirect embodied technological spillovers can be calculated as an increase in the quality and quantity of products in direct proportion to the implementation of the direct results of the project in oil refining and petrochemicals. The large-scale ESPO-2 project is characterized by complex chains of input-output multi-regional relationships, and it is proposed for it to determine endogenously indirect and cost effects using OIMM and an econometric model.

Tab. 1: The ratio of the main effects in two projects (net present value, %)

Indicators	Project of Core Facility "Catalyst Pilot Production"		Project of the ESPO-2 pipeline
	Without support	With support	Without support
1. Financial efficiency	-0.3%	0.4%	6.4%
2. Tax effects	28.4%	27.9%	40.6%
3. Technological spillovers effects	71.9%	71.7%	53.0%
4. Economic efficiency	100.0%	100.0%	100.0%

Source: This work.

Both projects are characterized by an extremely high level of economic efficiency, in all respects significantly exceeding the level of financial efficiency. Table 1 for the two projects under consideration presents the ratio of the levels of net present value in the framework of financial and economic efficiency (taken as 100%) as well as the main economic effects. For the CPP project, the financial efficiency in the option without government support is negative, and private investors are not interested in its implementation. As a result of its provision, financial efficiency becomes positive.

Despite the significant difference between these two projects, the main economic effects for them are similar. They arise beyond their institutional framework, primarily in the form of indirect and tax effects when using products (in oil refining and petrochemicals for catalysts, in the entire chain of input-output multi-regional relations for the pipeline project).

For both projects, a fundamental problem arises of analyzing the institutional structure of investment activity and the choice of institutional forms of coordination, ensuring a combination of interests of the direct participants in the projects and society as a whole. This problem is

manifested in a combination of low financial and high social efficiency and the need to implement the infrastructure projects under consideration on the principles of public-private partnership.

Conclusion

Assessment of research infrastructure projects at the microeconomic level can be significantly improved and will benefit the scientific community by considering and quantifying not only narrow financial, but also wider public effects.

The proposed approach is based on simultaneous assessment of financial and economic efficiency in the multi-period model of research infrastructure project in order to better fit the interdisciplinary and multilevel project results through the analysis of the economic efficiency. It takes into account the increasing interdependence of participants both within and beyond the institutional frameworks of such projects. This approach is especially important for innovative and infrastructure projects which are characterized by a significant level of economic efficiency compared to financial efficiency, the corresponding gap between the two types of efficiency and the relevant public effects (embodied technological spillovers, externalities, tax and price effects).

The application of simultaneous financial and economic approach allows deep qualitative and quantitative justification for the government support of socially significant projects. The results of experimental calculations for real projects demonstrate the advantages of this approach and the possibility of quantifying the consequences of government intervention for the successful implementation of research infrastructure projects, therefore, ensuring sustainability in the conditions of modern scientific and technological development.

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INSIGHTS INTO SOME ANTECEDENTS OF THE LIKELIHOOD OF AN ENTREPRENEURIAL INTENTION AMONG YOUTH: A CASE OF BOSNIA AND HERZEGOVINA

Jasmina Okičić

Abstract

Purpose: The main goal of this paper is to determine the individual and situational antecedents of an entrepreneurial intention likelihood among young women and men in Bosnia and Herzegovina (BiH).

Design/methodology/approach: For this study, the USAID MEASURE-BiH National Youth Survey (NYS) data set was used made up of randomly selected respondents from BiH (N=4,500). The data were collected from January to February 2018. The main instrument of the research was a questionnaire used for the collection of socio-demographic variables as well as several factors such as education, employment, training, social capital, emigration, *etc*. The probit model was used for better analysis of entrepreneurial intention among youth.

Findings: The research findings have revealed a statistically - significant difference between the entrepreneurial intention and selected individual and situational antecedents. Furthermore, the findings have also suggested that gender, nonformal education, perception of current employment opportunities and attitude towards emigration, do have a significant impact on the likelihood of entrepreneurial intentions among young people.

Research/practical implications: This study is expected to contribute to the more efficient development of the evidence-informed policy decision making in BiH, in terms of designing tailored – made and gender-sensitive entrepreneurial training programs which would meet the needs of young people in BiH and which are expected to be perceived as non-formal forms of education (optional).

Originality/value: The study is one of the first research studies dealing with this topic in BiH which was conducted following the principles of representative sampling methodology framework. As such, the findings obtained during this research can be viewed as reliable and can serve as a solid base for the development of further, similar research studies which could lead to the design of various forms of nonformal education programs for young people in BiH, thus motivating them to start strategically thinking and successfully implementing their entrepreneurial idea(s) in BiH.

Keywords: entrepreneurial intention, youth, probit

JEL Codes: C80, L26

Introduction

Krueger, Reilly and Carsurd (2000) have shown that intentions are the single best predictor of any planned behavior, including entrepreneurship and that understanding the antecedents of intentions increases the understanding of the intended behavior. To date, a considerable body of research has sought to understand the concept of entrepreneurial intention in general. Ferreira, Loiola and Gondim (2017) state that there was an increase of 41% in studies on entrepreneurial intention between 2004 and 2015, in various countries and continents, which reveals the increased interest in the subject. However, when it comes to examining the entrepreneurial intentions among young people from Bosnia and Herzegovina (BiH), as a non – EU country, there is a certain research gap. It is well known that young people are most affected by unemployment in BiH. According to the Agency for Statistics of Bosnia and Herzegovina (2019), the unemployment rate was the highest among young persons aged 15 to 24 years. It was 33.8% (31.3% for men and 37.9% for women).

Besides unemployment, BiH is facing a huge youth emigration problem. Young people from BiH mainly emigrate to European countries in search of better living conditions. Emigration from BiH is a continual process that is caused by many factors. In that respect, the Ministry of Human Rights and Refugees of Bosnia and Herzegovina (Bosnia and Herzegovina – Ministry of Security, 2018, p. 10) stated that the total number of persons originating from BiH (including the second and third generation of BiH emigrants) reached a number of at least two million persons.

Youth unemployment and emigration are remaining the key development challenges that BiH is facing. Therefore, to support a further development of decision – making policies in the labour market of BiH it is important to identify factors that may drive entrepreneurial activity among young people. In that respect, the starting point of this research study is related to addressing the following question: Can individual and situational factors, among many others, be considered as antecedents of the likelihood of entrepreneurial intention among young women and men*?* The main goal of this paper is to explain the likelihood of entrepreneurial intention among youth under the influence of individual and situational factors. Concerning the research question and the main goal, the central research hypothesis has been defined as follows: Besides other factors, individual and situational factors of young people may also be considered as antecedents of their entrepreneurial intention likelihood.

The paper is organized as follows. After the introduction, the following section gives a brief outline of the theoretical background that is relevant to the research. The paper moves

on describing methodology, after which follows the discussion of the results. In the end, a summary of the main conclusions is given.

1.   Theoretical framework

According to Linan, Nabi & Krueger (2013) an entrepreneurial intention is defined as conscious awareness and conviction by an individual with the intent to set up a new business venture and plans to do so in the future. In that respect, Krueger, Reilly and Carsurd (2000) claim that the decision to be self-employed is considered voluntary, conscious and intentionally planned. Early research on the factors that influence entrepreneurial intention were typically focused on the personality or cultural background of the individual entrepreneur as a determinant of entrepreneurial behaviour traits (Low & MacMillan, 1988, p. 146). In that respect, most studies have focused on Ajzen's (1991) theory of planned behaviour and Shapero and Sokol's (1982) entrepreneurial event model to understand the factors of entrepreneurial intentions. Based on the findings of similar studies (Santos, Caetano, & Curral, 2013; Ward, Hernández-Sánchez, & Sánchez-García, 2019; Camelo-Ordaz, Diánez-González, & Ruiz-Navarro, 2016; Dawson & Henley 2012; Kirkwood, 2009; Krueger, Reilly, & Carsrud, 2000; Linan, Nabi, & Krueger, 2013; Ojiaku, Nkamnebe, & Nwaizugbo, 2018; Ozaralli & Rivenburgh, 2016; Simoes, Crespo, & Moreira, 2015; van der Zwan et al., 2016; Wijaya & Sunarta, 2019; Zampetakis *et al.*, 2011, *etc.*), in this research focus will be on individual and situational factors as possible antecedents of an entrepreneurial intention likelihood among young women and men. It is well known that personality factors, known as the Big Five (conscientiousness, agreeableness, openness to experience, extraversion, and emotional stability), and psychological factors such as risk propensity, internal locus of control, self-efficacy, motivation, and attitude are variables considered strong predictors of entrepreneurial intention in many studies (Ferreira, Loiola, & Gondim, 2017, p. 298). However, although the concept of this particular research is limited by the USAID MEASURE-BiH National Youth Survey (NYS) data set, in the above-presented literature similar attempts aimed at identifying individual and situational antecedents of employment intention likelihood among youth. In this research, the focus is on the following potential antecedents: (1) Individual factors: the highest level of formal education, participation in non-formal education, demographic characteristics and household characteristics; (2) Situational factors: employment status, perception of employment opportunities, perception of current living standard and attitude toward emigration. The concept of entrepreneurial intention is multidimensional. Hence, there are some possible limitations in this study. The first limitation refers to the omitted variables problem. There are many other variables (*i.e.* personality characteristics, including general self-efficacy, locus of control, proactiveness, autonomy,

innovativeness, optimism, competitiveness *etc.*), not only individual and situational factors, that affect the likelihood of entrepreneurial intention. However, this limitation does not diminish the importance of investigating the impact of these variables on the likelihood of an entrepreneurial intention among youth. Another limitation of the study is that the data available are not longitudinal and therefore we cannot study any population changes across time.

2. Methodology

2.1 Data and methodology

Focusing on the individual and situational dimensions, the research study seeks to determine to what extent a profile of young men and women having an entrepreneurial intention differ from those having no such intention.

Following van der Zwan *et al.* (2016) and Simoes, Crespo and Moreira (2015), the following factors were taken into account during the analysis: age, gender, education, household size and income. Situational factors are presented by the current employment status, the perception of employment opportunities, the perception of current living standard and an attitude towards emigration. A similar approach was used by Similar, Ozaralli and Rivenburgh (2016) who examined the following three influences on entrepreneurial intention: 1) personality factors, 2) social factors (personal experiences and education)and 3) societal factors (the perceived political and economic climate of the country).

2.2 Data source and sample

In 2017, the United States Agency for International Development Bosnia and Herzegovina Mission (USAID/BiH) commissioned IMPAQ International (IMPAQ), under the Monitoring and Evaluation Support Activity (MEASURE-BiH), to conduct the National Youth Survey in Bosnia and Herzegovina (NYS-BiH). NYS-BiH provides insights into the state of BiH youth, examining their perceptions, attitudes, and experiences on relevant topics including education, employment, inter-ethnic relations, political and civic participation, and migration intentions (Monitoring and Evaluation Support Activity, 2018). The NYS-BiH was conducted in January and February of 2018.

The sample contains 4,500 individuals age between 15 and 44 and it was constructed using a multi-stage stratified probability sampling approach. To ensure representative coverage, the sample was stratified by entities and Brcko District, ethnic majority areas, and geographic regions. Within each region, the sample was further stratified to include municipalities of all sizes (Monitoring and Evaluation Support Activity, 2018). The Youth Law of the Federation of Bosnia and Herzegovina ("Official Gazette of the FBiH", No. 36/10), the Law on Youth

Organisation of the Republika Srpska ("Official Gazette of the Republic of Srpska", No. 98/04, 119/08 and 1/12) and the Law on Youth of Brcko District ("Official Gazette of the Brcko District", No. 18/17) set the age of thirty as the upper age limit for youth. In that respect, our sample contained 1,498 young women and men ranging from ages 18 to 30.

2.3   Methods

To better understand the determining factors of the likelihood of entrepreneurial intention among young people from BiH descriptive statistics and chi-square independence test were used. Besides, the probit regression model was used to examine the likelihood of an entrepreneurial intention. The dichotomous dependent variable was positive *vs.* negative entrepreneurial intention. Probit regression analyses procedures using STATA version 13 was used to estimate the model.

3.   Results and discussion

Table 1 gives a brief overview of the selected variables used in this research.

Tab. 1: Overview of selected variables

VARIABLES	Frequency	Per cent
DEMOGRAPHIC		
Gender		
Male	754	50.33
Female	744	49.67
Age		
18-22	672	44.86
23-26	481	32.11
27-30	345	23.03
HOUSEHOLD CHARACTERISTICS		
Household income		
No income	128	7.74
Up to 300 BAM	52	3.14
301 to 500 BAM	214	12.94
501 to 1000 BAM	616	37.24
1001 to 1500 BAM	389	23.52
1501 to 2000 BAM	171	10.34
2001 to 2500 BAM	84	5.08
Contribution to the household budget		
No	742	49.53
Yes, but not regularly	315	21.03
Yes, regularly	441	29.44

EMPLOYMENT STATUS		
Currently unemployed	1,623	66.82
Works in a state-owned company	185	7.62
Works in a privately owned company	621	25.57
PERCEPTION OF EMPLOYMENT OPPORTUNITIES IN BIH		
Satisfied with the employment opportunities in BiH	87	5.81
Dissatisfied with the employment opportunities in BiH	1,411	94.19
PERCEPTION OF CURRENT LIVING STANDARD		
Bad	284	17.35
Average	1,076	65.05
Good	291	17.59
HIGHEST LEVEL OF FORMAL EDUCATION		
Elementary school	163	10.77
Secondary school, 3-year program	309	20.41
Secondary school, 4-year program	859	56.74
University education, bachelor	183	12.09
NONFORMAL EDUCATION		
Has not participated in programs of nonformal education	1,210	80.77
Has participated in programs of nonformal education	288	19.23
ATTITUDE TOWARD EMIGRATION		
Negative attitude toward emigration	680	44.91
Positive attitude toward emigration	834	55.09
ENTREPRENEURIAL INTENTION		
Negative	1,852	78.35
Positive	606	24.65

Source: Created by the author based on USAID MEASURE-BiH National Youth Survey (NYS).

The chi-square test of independence was performed to examine the difference between the variables listed in Table 1. The analysis findings revealed a statistically-significant difference between the entrepreneurial intention and the following variables, as follows: (1) gender, $\chi^2(1, N = 1{,}498) = 29.89$, $p < 0.001$, Cramér's V $= -0.141$; (2) contribution to household budget, $\chi^2(2, N = 1{,}498) = 20.91$, $p < 0.001$, Cramér's V $= 0.118$; (3) employment status, $\chi^2(2, N = 1{,}498) = 15.25$, $p < 0.001$, Cramér's V $= 0.1009$; (4) perception of employment opportunities, $\chi^2(1, N = 1{,}498) = 18.29$, $p < 0.001$, Cramér's V $= -0.111$; (5) perception of living standard, $\chi^2(2, N = 1{,}498) = 6.47$, $p < 0.05$, Cramér's V $= 0.066$; (6) formal education, $\chi^2(3, N = 1{,}498) = 6.92$, $p < 0.10$, Cramér's V $= 0.068$; (7) nonformal education, $\chi^2(1, N = 1{,}498) = 16.22$, $p <$

$0.001,$ Cramér's V $= -0.104$ and (8) attitude towards emigration, $\chi^2(1, N = 1,498) = 15.48, p < 0.001,$ Cramér's V $= 0.102.$

3.1 Model performance analysis

To evaluate the impact of selected factors on the likelihood of entrepreneurial intention probit model was used. The goodness-of-fit was evaluated using the following measures: Pearson chi-square statistics, Hosmer and Lemeshow goodness-of-fit test, classification tables and pseudo R^2.

Pearson chi-square statistics results confirmed the entire model (with all predictors included) as statistically significant (p =0.000). In other words, the model as a whole fits significantly better than a model with no predictors. This was also confirmed by the Hosmer and Lemeshow goodness-of-fit test (p =0.2883). According to the classification tables, the model correctly classifies 73.77% of cases. As expected, probit models, in general, produce a low value of pseudo R^2 (0.063). Hosmer and Lemeshow (2000) point out that low values of pseudo R^2 in probit regression are the norm that may pose a problem in reporting their values to the audience accustomed to seeing linear regression values. Table 2 displays the results of the estimated model with marginal effects included.

Tab. 2: The estimated model with the marginal effects

INDEPENDENT VARIABLES	B	S.E.	Sig.	MEMs	S.E.	Sig.	AMEs	S.E.	Sig.
DEMOGRAPHIC									
Gender									
Female	-.344	.074	.000	-.111	.024	.000	-.107	.023	.000
Age									
23-26	-.167	.874	.058	-.053	.028	.056	-.051	.027	.056
27-30	-.035	.100	.723	-.012	.033	.722	-.011	.032	.722
HOUSEHOLD CHARACTERISTICS									
Household size	-.026	.032	.424	-.008	.010	.424	-.008	.010	.424
Household income									
Up to 300 BAM	.188	.250	.456	.057	.077	.467	.054	.075	.466
301 to 500 BAM	.081	.177	.651	.023	.051	.648	.023	.044	.649
501 to 1000 BAM	.281	.157	.008	.087	.045	.055	.084	.044	.057
1001 to 1500 BAM	.217	.166	.196	.066	.048	.176	.064	.047	.178
1501 to 2000 BAM	.151	.191	.429	.045	.056	.424	.044	.054	.424
2001 to 2500 BAM	.251	.224	.266	.077	.070	.272	.074	.067	.271

Contribution to the household budget									
Yes, but not regularly	.259	.096	.007	.087	.033	.008	.083	.031	.008
Yes, regularly	.046	.140	.743	.014	.044	.744	.014	.043	.744
EMPLOYMENT STATUS									
Works in a state-owned company	-.195	.179	.287	-.057	.049	.262	-.055	.048	.265
Works in a privately owned company	.219	.132	.101	.075	.046	.109	.071	.044	.109
PERCEPTION OF EMPLOYMENT OPPORTUNITIES IN BIH									
Dissatisfied with the employment opportunities in BiH	-.495	.146	.001	-.179	.057	.002	-.171	.054	.002
PERCEPTION OF CURRENT LIVING STANDARD									
Average	-.005	.102	.964	-.001	.032	.964	-.001	.031	.964
Good	.195	.130	.133	.066	.044	.132	.063	.042	.132
FORMAL EDUCATION									
Secondary school, 3-year program	.260	.145	.072	.085	.462	.063	.082	.004	.064
Secondary school, 4-year program	.104	.130	.442	.032	.039	.430	.030	.038	.432
University education, bachelor	.028	.176	.876	.008	.053	.876	.008	.051	.876
NONFORMAL EDUCATION									
Participation in programs of nonformal education	-.272	.094	.004	-.092	.033	.006	-.086	.032	.006
ATTITUDE TOWARD EMIGRATION									
Positive attitude toward emigration	.224	.075	.003	.072	.024	.002	.070	.023	.003
_cons	-.246	.273	.368	-	-	-	-	-	-

Source: Created by the author based on USAID MEASURE-BiH National Youth Survey (NYS).

As can be seen from Table 2, statistically-significant variables prove to be statistically-significant: gender ($p < 0.001$); certain age categories ($p < 0.10$), certain categories of household income ($p < 0.01$), regular contribution to the household budget ($p < 0.01$), perception of

employment opportunities in BiH (p<.01), a-3- year secondary school   (p < 0.10), participation in programs of nonformal education (p < 0.01) and positive attitude toward emigration (p<.01).

The analysis findings suggest that there is a gender gap which influences the entrepreneurial intention. In other words, when all covariates are at their means, the predicted likelihood of having an entrepreneurial intention is 10.70% smaller for young women comparing to young men. The expected change is statistically significant (p<.0001). Finally, it seems that when all covariates are at their means, the predicted likelihood of having an entrepreneurial intention is 7.00% greater for those young women and men having a positive attitude towards emigration comparing to those without it. The expected change is statistically significant (p<.01).

Following the findings of Camelo-Ordaz, Diánez-González, & Ruiz-Navarro (2016), this research study results also confirmed that gender decisively influences entrepreneurial intention. Similar to findings of Ozaralli and Rivenburg (2016), significantly-lower intentions of young women than their male counterparts add evidence to previous empirical research that reveals that almost twice as many men as women become entrepreneurs (Acs *et al*., 2005) and that these differences appear to be consistent across countries. This result is not surprising given the fact that literature generally indicates entrepreneurship is a male-dominated field (Ward, Hernández-Sánchez, & Sánchez-García; Muntean & Ozkazanc-Pan, 2015). *Summa summarum*, gender is a highly confounding variable that moderates entrepreneurship behavior and intentions (Haus *et al*., 2013; Guzman & Kacperczyk, 2019), therefore, should always be controlled for.

Speaking of household characteristics, the predicted likelihood of having an entrepreneurial intention is 8.70% greater for individuals whose household income ranges from 501 to 1000 BAM. When all covariates are at their means, the predicted likelihood of having an entrepreneurial intention is 8.40% greater for these individuals comparing to those with no household income. The expected change is statistically significant (p<.10). It also seems that those young women and men who contribute to the household budget have 8.30% greater predicted likelihood of having an entrepreneurial intention comparing to those who do not contribute. The expected change is statistically significant (p<.01).

The analysis of formal education revealed that when all covariates are at their means, the predicted likelihood of having an entrepreneurial intention is 8.20% greater for individuals who completed a 3-year p secondary school comparing to those who completed only elementary school. The expected change is statistically significant (p<.10). Speaking of nonformal education (*i.e*. short courses, such as languages, ICT skills, communication skills, *etc*.), it may be concluded that when all covariates are at their means, the predicted likelihood of having an entrepreneurial intention is 8.6% smaller for individuals who have did not participate in any

kind of nonformal education comparing to those who do did. The expected change is statistically significant (p<.001).

As for situational factors and the perception of employment opportunities in BiH, the analysis findings revealed that when all covariates are at their means, the predicted likelihood of having an entrepreneurial intention is 17.1% smaller for individuals who are dissatisfied comparing to those who are satisfied. The expected change is statistically significant (p<.01).

Having in mind the continuous trend of youth emigration, it is not surprising at all that when all covariates are at their means, the predicted likelihood of having an entrepreneurial intention is 7.00% greater for individuals who are definitely planning to leave the country comparing to those who do not. The expected change is statistically significant (p<.01).

Conclusion

Irrespective of the fact that a considerable body of research has sought to understand the entrepreneurial intention in general, little research of this kind has been done in BiH so far. Being (still) a non-EU state, it is not surprising that there is a significant research gap in terms of determining the impact of individual and situational factors on entrepreneurial intention. To support a further development of decision – making policies in the labour market of BiH, it is of immense importance to start identifying and understanding the factors that could drive entrepreneurial activity among young people.

The analysis findings have revealed a statistically-significant difference between the entrepreneurial intention and selected individual (*i.e.* gender, contribution to the household budget, formal education, nonformal education) and situational factors (*i.e.* employment status, perception of employment opportunities, perception of living standard, attitude towards emigration). The findings also have suggested that gender, non-formal education, perception of current employment opportunities and attitude toward emigration, have an impact on the likelihood of entrepreneurial intentions among young people from BiH.

The research findings of this study can contribute to the process of creating a new decision-making policy aimed at the creation of various forms of nonformal education programs for young people in BiH, thus motivating them to start strategically thinking and successfully implementing their entrepreneurial idea(s) in BiH.

Besides, the analysis findings suggest that there is a gender gap influencing entrepreneurial intentions, with young men having a higher likelihood of having entrepreneurial intention comparing to young women. This observation leads to the conclusion that policymakers should also provide tailor-made educational programmes for women.

Although the research is limited by the use of USAID MEASURE-BiH National Youth Survey (NYS) data set, the research findings may serve as a useful source of relevant information which can be used by BiH government decision-makers, in case the government is to take serious steps regarding the creation of employment policies for young people.

This study was conducted following the principles of representative sampling methodology framework due to which this research can be viewed as a reliable source of information and can serve as a solid base for the development of further similar research studies focusing, in particular, on examining the impact of personality factors (conscientiousness, agreeableness, openness to experience, extraversion, and emotional stability), and psychological factors (risk propensity, internal locus of control, self-efficacy, motivation, and attitude on entrepreneurial intention) among young people from BiH.

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MULTIDISCIPLINARY APPROACH TO MOTIVATION FACTORS OF ABUSE OF TAX SYSTEM

Cecília Olexová – Emília Duľová Spišáková – Jana Simonidesová

Abstract

Purpose: The main aim of the paper is to provide conceptual view on motivation factors of tax avoidance and tax evasion and to design the preliminary model to predict the behaviour of entrepreneurs leading to tax system abuse.

Design/methodology/approach: The paper is based on the theory of planned behaviour. The exploratory analysis, systematic literature review and synthesis are used to determine the motivational factors used in the preliminary model.

Findings: The preliminary model to predict tax non-compliance behaviour was proposed. The economic and socio-economic, political, legislative, psychological and ethical-morale factors and their interactions are included in the form of the preliminary model through five predictors of behaviour, which are the attitude toward the behaviour, subjective norms, perceived behavioural control, capability and opportunity.

Research/practical implications: The determination of the factors causing the tax avoidance and tax evasion broadens the knowledge on tax compliance or tax fraud attitude and prevent the unfavourable behaviour by devising practical legislative measures.

Originality/value: The paper provides the comprehensive approach to determining the motivation factors of tax avoidance and tax evasion based on the systematic review, to fill the gap in the literature of tax compliance or non-compliance behaviour of entrepreneurs.

Keywords: tax avoidance, tax evasion, theory of planned behaviour, abuse of tax system

JEL Codes: H26, K34, K42

Introduction

The tax system abusive or fraudulent cases are caused by various factors and this is the reason of extensive research focused on the motivation factors of tax avoidance and tax evasion formation.

According to the basic and most general terminology given by the various EU institutions (in particular the Commission) in the various legislative and non-legislative acts and subsequently adopted by the Member States, there are differences in the nature and features of the basic forms of illegal taxation. For example, in Slovakia or the Czech Republic neither of these forms of tax fraud is legally defined. These are tax fraud, tax evasion and tax avoidance.

In any case, these forms of unlawful conduct are actually abusing the tax system of the Member State concerned, in particular in an illegal manner, but in the third case partly also within the law (Babčák, 2017). Tax avoidance constitutes a legal but unauthorized use of the tax regime for the purpose of reducing or circumventing tax liability.

Tax fraud, tax avoidance and tax evasion, called as the abuse of tax system, have the main common characteristics related to taxpayers´ harmful behaviour. This behaviour is a significant problem to be solved as it has a negative impact on the state budget and the economic stability, state services provided to citizens and entrepreneurs and it deteriorates the competitive environment (e. g. the level of the tax gap, expressed in percent of VAT total tax liability, is 23.2% in 2017 in the Slovak republic, in abs. amount 1.8 billion € and in EU members states 137 billion €). Then, the political decisions can even lead to further increase of the taxes to ensure state budget revenue.

The motivational factors in tax law are essential indicators of the tax compliance behaviour of taxpayers and the resulting tax liability, and finally, the belief that the state is the rule of law.

Some of the surveys of motivation factors are focused on selected countries, e.g. Gangl et al. (2016) investigated the relationship of patriotism to tax compliance in Austria, Torgler (2003) in the U.S.A. Different studies compare the approach to paying taxes across countries. The impact on attitudes to paying taxes in Europe is presented by Torgler and Schneider (2007). Alm and Torgler (2006) compare the tendency to pay taxes in the U.S.A. and Spain and later in 14 other European countries. An extensive survey on socio-demographic categories in relation to tax compliance based on survey meta-analysis in 111 countries was published by Hofmann et al. (2017). Some studies are focused on various types of taxes, e.g. VAT (Webley and Ashby, 2010) or tax subjects. All these surveys are aimed at individuals as taxpayers. Literature much less presents the tendency to pay or to avoid paying taxes of corporate

taxpayers. According to Mohd Yusof and Lai (2014), most corporate tax frauds are due to the misconducts of their executives who commit tax frauds for personal interest or organizational reasons. Kolodzjej (2014) concluded that there are differences between tax attitudes among entrepreneurs and employees. Entrepreneurs formulated more negative opinion on tax system, employees formulated more severe opinions on tax evasion in comparison with entrepreneurs.

The clear and comprehensive definition of the factors of tax avoidance and tax evasion formation is missing in the literature. Political, legislative, economic, socio-demographic, psychological and ethical-moral sets of factors are mostly analysed, in the domestic (Babčák 2017; Lenártová 2000; Radvan, 2015) and also international context (e. g. Gangl et al., 2013; Goslinda and Denkers, 2009; Harju et al., 2019; Kaplanogou et al., 2016; Kirchler and Maciejovsky, 2001; Kolodzjej, 2014), although the authors differ in the definition of specific factors. Also, many of these factors are overlapping.

The aim of the paper is to determine the factors that enter the decision of taxpayers and affect their behaviour based on the previously published results of relevant studies. The contribution of this review is the suggestion of the preliminary model of all these factors (observed or presumed causes) to predict the tax avoidance and tax evasion behaviour of entrepreneurs. The preliminary model is based on the theory of planned behaviour (Ajzen, 1991).

1.   Methodology of systematic review and model proposal

The determination of the motivation factors of tax avoidance and tax evasion resulted from a systematic literature review. The methodology was influenced by Linnenluecke et al. (2019) and Dvouletý et al. (2020), although due to the specific needs the review was not conducted at such a depth.

Comprehensive overview of motivation factors of abuse of tax is missing in the literature. But we believe that summarizing of literature can be interesting for professionals and state representatives in finding solution how to achieve better tax morale and tax compliance by considering all the aspects of behaviour of taxpayers (only entrepreneurs).

The key words that were used were defined very specifically to focus attention on our needs: tax-evasion behaviour of entrepreneurs, tax compliance behaviour of entrepreneurs, motivational factors of tax evasion behaviour and tax avoidance behaviour. These key words were used for a search in the most well-known scientific databases (Web of Science, Scopus). The time period was determined from 2000 till 2020. The results of search in both databases were compared and duplicate papers were excluded.

The articles were published in different journals, e. g. Journal of Economic Psychology, Sustainability, European Journal of Law and Economics, Journal of Public Economics.

We also used additional Slovak and Czech literature that might not be available through these databases, but is available in the university libraries in Slovakia and we considered them as valuable articles of the highly professional authors of the tax system topics. The final list included 19 articles from WOS and Scopus databases and 5 sources from libraries. Full texts of these articles were subject to a literature review.

To propose the preliminary model of motivation factors of tax system abuse, the knowledge related to the theory of planned behaviour (Ajzen, 1991) and fraud diamond theory (Hooper ad Pornelli, 2010; Wolfe and Hermanson, 2004) were also used.

2. Review of studies on motivation factors of abuse of tax system

The author keywords and also keywords plus were examined first, the five most used were:

- tax compliance (N = 18);
- tax evasion (or income tax evasion), tax avoidance (N = 14);
- entrepreneur, entrepreneurial behaviour (N = 10);
- tax experiment (N = 5);
- trust (N = 5).

The brief review of literature with the year of publication, main topic, specific topic (or variable), event. the countries of analyses are in the Table 1.

The details related to proposal of the preliminary model of tax evasion behaviour are presented in the part 3.

Table 1: Review of literature

Authors	Year	Topic / Specific topic or variable / countries of analyses
Alalehto	2003	economic crime / personality matters in economic crime / Sweden
Alm & Torgler	2006	tax morale / culture differences / U.S.A., Spain and other 14 European countries
Fanea-Ivanovici et al.	2019	tax compliance / corruption, transparency, confidence in institutions / Romania
Fedotov & Pokrovskaia	2017	taxpayer behaviours / regional differences / Russia
Gangl et al.	2016	tax compliance / patriotism impact / Austria
Gangl et al.	2013	tax compliance / tax authorities
Goslinga & Denkers.	2009	tax non-compliance / personal and social norms, business entrepreneurs / Netherlands
Harju et al.	2019	tax compliance / VAT compliance costs vs. incentives are more important than VAT rate
Hofmann et al.	2017	tax compliance / sociodemographic categories / 111 countries
Kaplanoglou et al.	2016	tax compliance / crisis / Greece
Kirchler & Maciejovsky	2001	tax compliance / situations, asset position, profession, demographic factors / Austria
Kolodzjej	2014	tax attitudes, tax abuse / risk propensity, difference between entrepreneurs and employees
Nagel et al.	2019	tax compliance / tax training program
Olexová & Sudzina	2019	tax compliance / personality / Slovakia
Rothengatter	2005	tax (non) compliance / social networks, multicultural nation / Australia
Stam & Verbeeten	2017	tax compliance / firm life course
Torgler & Schneider	2007	tax compliance / attitude / European countries
Torgler	2003	tax compliance and tax morale / research / U.S.A.
Webley & Ashby	2010	VAT compliance /economic psychology
Babčák	2017	abuse of tax system / types and factors / EU
Lenártová	2000	tax evasion / motivation factors
Radvan	2015	tax system / administration
Stieranka et al.	2016	tax abuse / tax evasion, criminality / Slovakia
Šimonová	2017	tax evasion / measures / Slovakia

Source: Own processing according to the literature.

The results of the literature review are used in the preliminary model proposal to predict tax fraud behaviour.

3. The preliminary model of predicting tax fraud behaviour

The theory of planned behaviour is used to explain the tax system abuse behaviour. The preliminary model (Fig. 1) is complemented by two other incentives for abuse of tax system, capability and opportunity, from the fraud diamond theory (Hooper ad Pornelli, 2010; Wolfe and Hermanson, 2004).

Fig. 1: Preliminary model of tax abuse behaviour
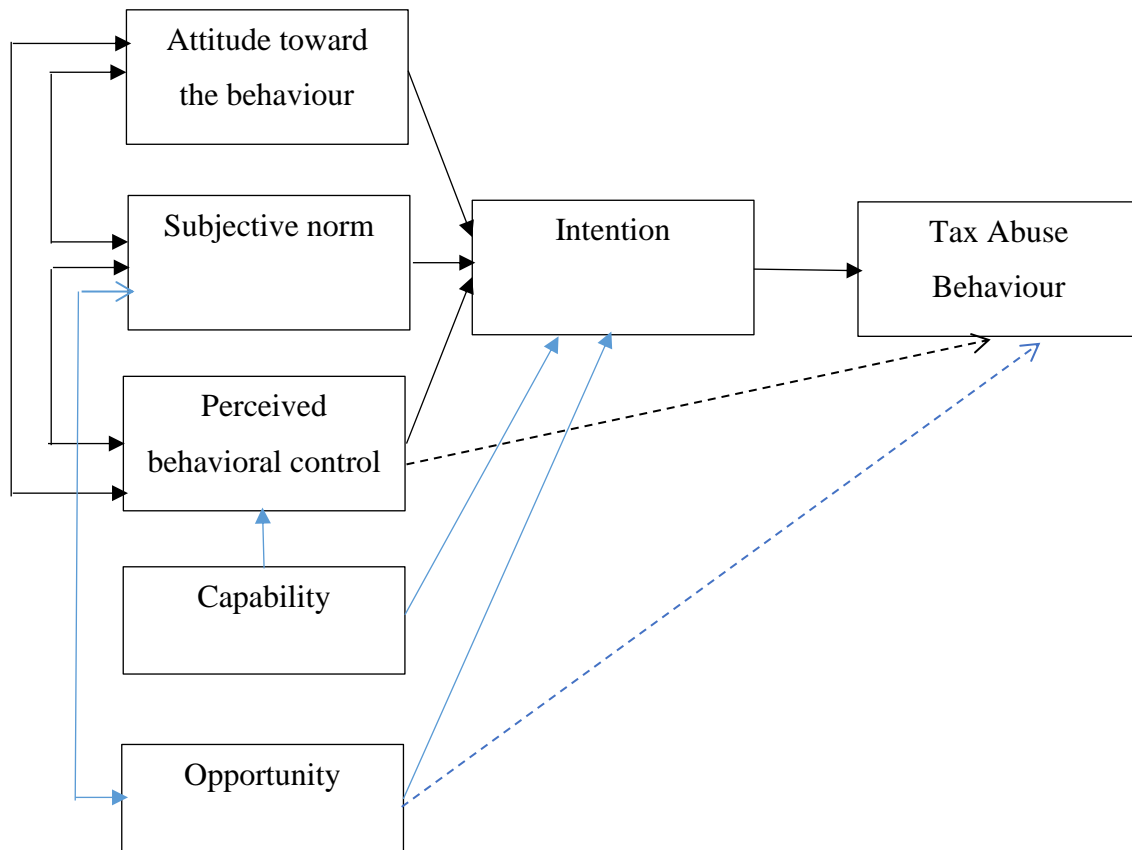
Source: Ajzen (1991), capability and opportunity added by the authors.

Attitude toward the act or the behaviour – The attitude of a person towards the fraud behaviour is formed from the positive and also negative perception of tax fraud. It is important how the person evaluates the outcome of his behaviour. This implies the subjectivity of the evaluation.

Each taxpayer reacts differently to the tax burden. This is related to the own fiscal margin. When the tax burden is perceived too high, taxpayer's activities in the legal economy are declining and the activity in the shadow economy is growing. The taxpayer becomes reluctant to pay taxes and has a greater tendency to tax evasion and tax avoidance. The other case is if a taxpayer assumes that his tax return will not be checked. Kolodzjej (2014) examined the relations between attitudes towards tax system, the financial risk propensity and tax morality. Although the income inequality estimated by Gini index is economic factors, the perception of the income inequality is subjective and varies across different country (Olexová et al., 2019). For this reason, it has social, economic and psychological dimension and influences the attitude towards the tax non-compliance behaviour.

Personality also takes important role of the attitude of the taxpayer. According to the findings of the research on the relation between personality traits and tax compliance (Olexová and Sudzina, 2019), conscientiousness from big-five inventory (responsibility and/or productiveness) influence the attitude towards tax fraud behaviour. Another personal trait, honesty from HEXACO model (modesty and/or greed avoidance), is related to higher tax morale. Demographic factors such as gender and way of living, influence the attitude toward the tax compliance behaviour, what was also confirmed before by Kirchler and Maciejovsky (2001). In compliance with Alalehto (2003), it can be concluded that personality does matter in economic crime.

Subjective norm – A social factor termed subjective norm refers to the perceived social pressure to perform or not to perform some behaviour. In the case of tax fraud behaviour, there are two predictors:

- Normative beliefs that refer to ethical-moral factors. These are different depending on the state and level of economy and the maturity of democracy in a particular country. The lack of tax ethics and moral and the resulting lack of solidarity with low-income social groups is usually associated with a higher degree of tax non-compliance behaviour. Normative beliefs are influenced also by attitude of the society to the corruption, inefficiency in state spending from the tax revenues, abuse of social system, the level of tolerance of the black and grey economy, and tax-legal knowledge. The subjective norms of managers refer to the company stakeholders' attitudes and corporate ethic norms, that influence the decision-making about the tax compliance or tax fraud behaviour. Goslinga and Denkers (2009) examined which factors have impact on non-compliance intentions of Dutch business entrepreneurs and their results showed that non-compliance intentions are stronger when personal and social norms do not support compliance.

- Motivation to comply is represented by economic factors, mostly the level of tax burden and the possibility of the methods to eliminate the tax system abuse. One of the causes to avoid or reduce paying taxes and other compulsory payments is to gain a competitive advantage towards the entrepreneurs with tax compliance behaviour. Tax compliance was examined also over the firm life course by Stam and Verbeeten (2017), who explained that relatively low tax compliance is in the growth syndrome and in accumulation phases of the firm, but for different reasons. In the growth syndrome phase, it is due to acute problems that need to be solved with insufficient

means. In the accumulation phase, the motivation is the effort to improve financial performance of the firm via tax evasion and tax avoidance.

Perceived behavioural control – the third predictor refers to the perceived ease or difficulty of performing the behaviour of interest. It is assumed to reflect past experience as well as anticipated impediments and obstacles.

Perceived behavioural control are related to psychological, legal and political factors.

- Psychological factors – we can say that internal control factor is mostly perceived through the experience with tax audit. In case of unpleasant tax audit experience, the managers would intend tax fraud behaviour in future. In case of respect during the tax audit, manager tend to have higher intention to comply with tax laws in future.

- Legal factors – these factors relate to the quality of tax legislation and the exactness of tax laws and their relative stability. This also implies the fulfilment of the requirement of legal certainty for tax subjects. Tax compliance is enhanced also by digital public services, as it reduces costs for entrepreneurs and increases their confidence in institution, as the processes are more transparent (Fanea-Ivanovici et al., 2019). External control factor of behaviour is represented mostly by government pressure and tools that can be used. According to the results of the survey in 550 small and micro enterprises in Greece regarding tax compliance behaviour, there is a relationship between the quality of political and tax institutions, perceived nature of power of tax authorities and tax compliance (Kaplanogou et al., 2016). Gangl et al. (2013) examined the influence of tax authorities' approach, their service orientation and trustworthiness of authorities on willingness to pay taxes among private taxpayers and entrepreneurs. Kirchler and Maciejovsky (2001) conducted the survey among self-employees and business entrepreneurs and confirmed that knowledge of the legal principles of Austrian tax law is correlated with tax morality. Harju et al. (2019) highlighted the VAT compliance costs (frequent filing of VAT reports, understanding the VAT system, etc.) as more important factor than VAT rate, among small firms and entrepreneurs.

- Political factors – these factors arise from the disagreement of taxpayers with political decisions and also by the specific tax policy of the state, transformed into tax laws, which depends on the composition of the political spectrum. Then, the taxpayer´s behaviour control can be influenced by the political opinion and belief in the government and public institutions in general. Political factors are related also to

geographical factors, Fedotov and Pokrovskaia (2017) confirmed the heterogeneity in tax behaviour in different regions.

Capability – the capability influences the perceived behavioural control as well as the intention to behaviour. The knowledge, experience and skills are possible predictor of behaviour. Carousel frauds are particularly challenging and demanding above-average skills of tax fraudsters. Another circumstance to take into consideration is in a corporate setting, where a manager has more capability to be involved in the fraud without being detected by other members in the company. Tax evasion can be conducted also by unconscious behaviour of taxpayers due to a low level or improper knowledge a lack of information or ignorance of the possibilities of the pertaining laws (Šimonová, 2017). According to Nagel et al. (20019), training of entrepreneurs helps to achieve higher profits and enhances the tax compliance.

Opportunity – The opportunity to conduct the behaviour, as external stimuli, and the availability of the necessary resources, such as time, money or relationship management play important role in influencing the behaviour of a taxpayer. On the other hand, government has the power to prevent opportunities by the adoption of various measures. In Slovakia, these are e. g. the introduction of IS CEP from 12/2014, establishment of the Financial Administration Criminal Office on 1 January 2012, amendment to Act no. 222/2004 Coll. in 2012, concerning the introduction of tax liability, tightening the conditions for voluntary VAT registration, lowering the limit to which the electronic cash register document is considered an invoice, tax guarantee when registering a taxpayer, further limiting the amount of cash payments as of 1 January 2013, or introducing a VAT control statement from 1 January 2014. The current measure is the introduction of the eKasa project, while the financial report estimates the proceeds in 2020 to 117.9 mil. € and a 15% reduction in the VAT gap in the HORECA, retail and services sectors. Needless to say, Goslinga and Denkers (2009) concluded that non-compliance intentions of entrepreneurs increase when economic deterrence, based on the perceived chance of detection and sanction severity, is weak and there are more opportunities to deviate from the rules.

Conclusion

The paper presents the theoretical framework of salient factors of tax avoidance or tax evasion behaviour. The proposed model integrates individual factors and organizational factor, internal and external and explain the intention to commit tax fraud.

As a general rule, the more favourable the attitude and subjective norms with respect to a behaviour, and the greater the perceived behavioural control, the stronger should be an individual´s intention to perform the behaviour under consideration. Perceived behavioural control, opportunity, together with behavioural intention, can be used directly to predict behavioural achievement. Higher opportunity and weak control might lead to deterioration of tax discipline, even to tax fraud.

Acknowledgement

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DEVELOPMENT OF SUSTAINABLE ENTREPRENEURSHIP IN UNIVERSITY ECOSYSTEM: KEY SUCCESS FACTORS

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Dolores Botella-Carrubi

Abstract

Purpose: the main goal of the article is to study sustainable entrepreneurship through the analysis of the case study of the Parc Científic Universitat de València. By doing so, our purpose is to deep into an institution that not only serves as a business incubator but also as a promoter of sustainable entrepreneurship though the arise of technology

Design/methodology/approach: the methodology used is qualitative. We have chosen this methodology since sustainable entrepreneurship is a nascent field of study in which theoretical and qualitative studies are needed. Before studying the case of sustainable entrepreneurship, it is important to know the institutions addressed to promote it.

Findings: A business incubator as the Parc Científic Universitat de València is not just useful to promote start-up creation but also to foster a type of entrepreneurship more in line with the environment. Through technology, ventures are supporting a sustainable entrepreneurship in a proper way.

Research/practical implications: The Parc Científic Universitat de València is an institution that presents a paradigm of start-ups promotion. Inside the PCUV there are several ventures but, the selection of the four cases can shed light on the success factors of new ventures born in the context of a technology cluster like the PCUV.

Originality/value: The present paper presents the main contribution of analysing a successful cluster of ventures. The theoretical framework developed at the study joined with the case study show how business incubators can act in order to achieve one of the main goals according to international organisms like the United Nations, to ensure environmental sustainability.

Keywords: sustainable entrepreneurship, innovation cluster, spin-off

JEL Codes: O35, Q01, Q55

Introduction

Entrepreneurship plays an important role in transforming the world in a more sustainable place, focusing not only in economic development but balancing social and ecological goals (Belz & Binder, 2017). It has been demonstrated the relevance of sustainability considerations when analysing development, conceived as economic growth (Ponce et al., 2018). Therefore, sustainable entrepreneurship has been mentioned as one of the main future solutions to solve climate challenges (Youssef et al., 2018).

The decision of creating a start-up is determined by many causes that could be split in external and internal factors and influenced by threats and losses of starting a business. When it comes to university students and young entrepreneurs without previous business experience, the fears and failure threats are intensified. For this reason, it is important that institutions such as governments and universities support entrepreneurial behaviour, to encourage the creation of innovation clusters and motivate the knowledge spill over between academic and business environments (Bélas et al., 2019).

Moreover, it is evident the emergence of start-up accelerators in the recent years in the main European cities. They provide new entrepreneurs with an innovation environment plus useful mentorship support offered by this new model of business incubation (Guijarro-García et al., 2019). Universities have imitated this model and generally offer incubation and acceleration spaces so that entrepreneurs can start their business operations endorsed by the institution and the entrepreneurial support activities it carries out.

In the light of the above, this paper contains a descriptive study of the start-up incubator and innovation cluster of the University of Valencia: the Parc Cientific Universitat de València, hereinafter PCUV. The companies located in the PCUV are technological-based and contribute to sustainable development, according to their area of activity and mission. The case study will be discussed in order to get the key success factors of the Parc Científic thay may be applied to different entrepreneurship University environments. On the other hand, there's little literature from the point of view of academic start-up incubators, so this research will benefit the academia with this complementary view.

The structure of this study will be the following: In the section one, a theoretical framework about the sustainable entrepreneurship and academic spin-off creation will be developed. Afterwards, the method and case study will be presented. To conclude with the results of this descriptive analysis and some recommendations in order to enhance sustainable entrepreneurship in academic environments and University innovation clusters.

1.   Sustainable entrepreneurship and spin-off creation

In the recent years the concept of sustainability has gained importance in research and business world. There are various definitions of sustainable entrepreneurship, but according the analysis of Belz & Binder (2017) this term could be defined as the process complying opportunity recognition, development and exploitation of sustainable research. According to their multi-case qualitative study, the sustainable entrepreneurship process comprises the development of a **triple bottom line solution** and finishes with the **foundation of a sustainable start-up and the entry of a sustainable market**. The concept of triple bottom line is based on the alignment of **economic, social and ecological values** when developing the entrepreneurial behaviour (Bocken, 2015). In connection with this, current global situation suggests without doubt that economic, social and ecological sustainability are increasingly gaining importance for achieving business objectives as well (Durich et al., 2019).

The motivation behind the sustainable entrepreneurship process differs from conventional start-up creation in the following features: green values, aim to embrace diversity and interdisciplinarity, interpersonal competence and systems thinking and organizational purpose of maximizing natural and human resources (Bocken, 2015).

According to several studies such as Du et al., (2019) and Li and Li (2019), the effect of green technology innovations on reducing CO_2 emission is significant and therefore plays a vital role in climate change mitigation. Governments and institutions also perform an important task in enhancing sustainable innovation, because their impact in entrepreneurship ecosystem is greater than other players such as netizens, cultural enterprises, or industry associations (Xie et al., 2019).

In this context it is important to highlight that university spin-off enterprises have been increasingly recognized as one of the key drivers to generate economic growth, principally but not only due to their active role in the transfer of scientific knowledge and research to business (Fontes, 2005). The entrepreneurial university spin-off creation is defined by Rasmussen (2006) as a process in which an opportunity or research-based idea, an individual or team of entrepreneurs and the relevant context (in this case, the University) create the ideal properties for a new company to emerge. This process is also named as technology transfer, but not necessarily should be accompanied by international property protection to ensure competitiveness (Teixeria & Ferreira, 2019).

There are, according the literature, more factors which influence the process of entrepreneurship development. Specific infrastructures, such as **scientific parks and business**

incubators, plus professional staff propitiate a suitable context for start-up creation in academic ecosystem. Entrepreneurial culture is also relevant for the universities in order to ensure technology transfer (O'Shea et al., 2005). This could be enhanced through the development of networking activities, the improvement of open innovation structures which allow value co-creation (Zeeshan et al., 2019), offers of training in business development, open innovation and design thinking methodologies, entrepreneurship-oriented organizational practices and more flexible academic careers (Fischer et al., 2019).

The process of spin-off creation is highly related with the concept and process of sustainable entrepreneurship. Current research in diverse scientific disciplines has the cross-cutting final objective of creating superior value and promoting long-term sustainability (Caseiro and Coelho, 2019). Therefore, with the enhancement of spin-off creation and the development of stronger innovation clusters in Universities, sustainable entrepreneurship will be also developed (Du et al., 2019). Taking into account this background, Scientific Parks and Start-up Incubators in Universities play a key role.

2. Case Study Approach

2.1 Methodology

As commented in the previous section, sustainable entrepreneurship is a nascent topic, so the qualitative methodology is appropriate to address the proposed research. The authors have conducted a descriptive study using the case study methodology, in order to analyse the characteristics that influence the development of sustainable entrepreneurship in academic environment.

This paper is based on the reports elaborated by the Parc Científic Universitat de València, in which the enterprises which conform de PCUV had been presented and analysed. The PCUV had at the beginning of the study 87 companies working in its facilities, but 83,75% of the total amount of companies responded the questionnaire and therefore were included in the study.

The main objectives of this study were, on the one hand, to evaluate the characteristics of the start-ups and entities based in the PCUV in order to identify best business practices and plan new strategies to support their growth and development. The authors have analysed in depth the most relevant parts of the abovementioned study and connect them with the development of the process of sustainable entrepreneurship and enhancement of the factors which influence it.

2.2 Case description

The The Parc Científic Universitat de València could be defined as a hotbed of start-ups that provides facilities, networking, business advice and an environment that encourages open innovation among all entrepreneurs and start-ups located in it. The PCUV has 87 companies based on its facilities, forming a strong entrepreneurial ecosystem belonging to the University of Valencia. In order to provide the reader with a big picture of the start-ups located in the PCUV, it could be highlighted that the start-ups are characterized by being companies of scientific or technological base. They belong to one of these areas of activity: engineering or consulting, biotechnological agri-food, medicine-health, ICT, electronics, human resources, chemistry or energy and environment. These companies invoice less than one million euros and their founders generally have higher university studies. Eight out of ten companies are less than seven years since its foundation.

The Parc Científic Universitat de València is located near the Sciences Campus in the city of Burjassot, in the outskirts of Valencia. It was founded in 2009 as a business incubator, and it has supported more than two thousand business projects since then. The most relevant areas of activity of the start-ups which form the PCUV are engineering or consulting (21.3%), biotechnological agri-food (20%), medicine-health (18.8%) and ICT-related (16,3). According to their mission, vision and goals, the vast majority of the companies of the PCUV offer a sustainable contribution to the society, following the definitions provided by the literature.

With regard to the internationalization stage of PCUV, the 41% of companies operate regularly abroad. Most of the companies in the PCUV allocate considerable investments to R&D, but just 52% of the entities own a patent to protect their developments. Those companies that do not protect their innovations with patents, do not do so due to the complexity of the processes to achieve them, their lack of knowledge regarding the process and the high cost derived from patentability. According Teixeira and Ferreira (2019) it is a regular practice in innovation environments. The innovation profile of the company, the type of intellectual property strategy, the size of the company or its innovation character are factors that use to influence this decision.

The financing of PCUV companies is mainly based in the organic sustainable growth of them. The 25.8% of start-ups has been externally financed, but the 53.2% of them desire being contacted by investors. The PCUV plays a role in connecting interested investors with entrepreneurs seeking financing.

Cortés-Guill & Villajos-Girona (2019) found several correlations regarding the characteristics of the start-ups. For instance, the companies derived from the research activity of doctors (academic spin-offs), present a positive relationship between scientific publications, R&D investment and international sales. As commented before, this is an indicator of knowledge transfer, from the academic and research stage to business environment. It allows to enhance major competitivity and therefore an increase in sustainable impact in the society.

2.3   Success stories

The PCUV makes available to interested people a kit for start-ups. It can be found in the website of the PCUV. In it, there is information related to entrepreneurship and marketing strategies for entrepreneurs who are not familiar with organizations management or other issues linked to business administration. One of the sections of this kit tells the story of four different ventures that are born in the PCUV context and which has achieved the success in terms of business performance. This study utilizes these four cases in order to look for the success factors behind the ventures created in the context of the PCUV.

The first venture analyzed is **Porib** (2020), it is described in its website as "a scientific and strategic Pharmacoeconomics and Health Outcomes Research consultancy" (Porib website).

The second venture is **Proiser R+D** (2020)**,** according to its website, it is "focused on research and development of automatic diagnostic systems" (Proiser R+D website)

The third company is **Imegen** (2020)**,** it is dedicated to genetic analysis. The different techniques of analysis that Imegen utilizes are mainly grouped into three different types of genetic mutation.

The last company, **Multiscan** (2020)**,** "was born with the mission to cover the sorting and selection needs of the Table Olives industry" (Multiscan website).

All these four companies are paradigmatic cases of ventures born in the context of PCUV. Although each one of them dedicates its activity to a different sector and then, the strategy followed and the target audiences are not the same, all of them join a series of characteristics that are similar. In a section dedicated to pieces of advice from the entrepreneurs of the ventures, they highlight the main difficulties and solutions that they have applied in order to face them.

The following table shows the recommendations of the entrepreneurs:

Venture	Recommendations	Success factor
Porib (2020)	"Be generous when you have to share, this is the only way to achieve the partners and the capital that you need. You cannot do it alone"	Partners
	"Take control of the financial necessities, make sure of the investment that you need"	Investment and funding
	"Do not miss the chance, specially if you are young. If you believe in your project it is very difficult that you fail"	Motivation
	"Look for the advice of someone who has undertaken a venture and who can be your advisor. His or her pieces of advice will be more valuable that the capital of investors"	Partners
	"Enjoy, get excited, if not, maybe this is not worth"	Motivation
Proiser (2020)	"Use the grants to increase the level of technological development, do not consider them as regular income of the venture, they are not"	Investment and funding
	"You have to sell the product to keep the company afloat and develop it"	Product features
	"Shape your venture to the client's necessities"	Product features
	"Reserve part of the benefits to strength the business capabilities, they will produce future benefits"	Investment and funding
Imegen (2020)	"Make sure that the people around you in your project are honest, upright and behave in the same way with them"	Partners
	"Offer reliable products"	Product features
	"Invest in communication. Build your brand and give of prestige"	Investment and funding
	"Dream but, keep your feet on the ground"	Motivation
Multiscan (2020)	"Dedicate yourself to something that you love"	Motivation
	"Work in different countries. Meeting different cultures is basic"	Business scope (internationalization)
	"Go with your lawyer when you meet with investors and possible partners"	Partners
	"The entrepreneur should keep a high share of the venture after the first round of investment, this will allow to realize new rounds"	Investment and funding
	"If you invest your own money, it will be easier to get money from others"	Investment and funding

3.   Results

The previous table shows the different pieces of advice that entrepreneurs of the ventures selected as examples by the PCUV give. These pieces of advice can be found at the website of the PCUV. As it can be seen, the recommendations of the entrepreneurs can be divided into five factors: investment and funding, partners, motivation, product features and business scope. Regarding the same factor, the investment and funding of the venture, this is the more repeated one. About it, the entrepreneurs highlight different elements such as taking the capital control of the venture, investing in certain areas like communications and using the capital resources

in a responsible way. Related to it, the PCUV offers a great net in order to seek investors and funding.

With regard to the partners, this factor should be understood in a broad sense. That is, not just commercial partners but also, tutors, advisors, and in general people around the entrepreneur. This factor is named by three of the four entrepreneurs. The main recommendations are addressed to assure the generosity with the people that can help you, the total reliability and the seek of advice from individuals that can have experience in business venturing.

The third factor is the most linked to entrepreneurs' features, that is, motivation. In connection with it, entrepreneurs show the importance of being passionate but realistic at the same time.

The following factor has to be with product features, that is, the selling of an appropriate product or service and the analysis of the client.

Lastly, the business scope, internationalization in this case, seems to be an important factor as well. However, it has been taken into consideration the difficulty to sell the products for a new venture, which can be the explanation of the low importance for the entrepreneurs of these four cases.

4.   Conclusions

After the analysis of the literature and the chosen case study, some conclusions could be derived from an exploratory perspective. The Parc Científic of the Universitat de València plays a key role in the Valencian entrepreneurial ecosystem, boosting sustainable entrepreneurship and innovation from the academic research perspective. The PCUV provides a whole support and training structure to the university community (students, graduates, professors and researchers) in terms of promoting sustainable entrepreneurship. There are three key factors on which the PCUV bases its role:

- Firstly, the PCUV provides facilities, resources and support to all entrepreneurs who want to start their projects within the park. This encourages open innovation, based on knowledge spill over and long-term sustainability through technological innovation of companies located in the PCUV (Rauter et al., 2019).
- Secondly, the promotion of the entrepreneurial culture in the university community: the PCUV is an entity capable of providing entrepreneurial training and innovation methodologies for the community. In addition, it organises various monthly events, programmes, competitions, talks and challenges, all of which follow a transversal axis

which is sustainability, ecology and the social impact of entrepreneurial actions. This aims to promote entrepreneurial values among students and researchers, to develop in them the motivation and capacity to sustainable entrepreneurship (Bocken, 2015).

– Finally, it is necessary to highlight its role in supporting the financing of business projects for sustainable development, in an indirect way. Thanks to an active role in connecting investors interested in sustainable entrepreneurship with entrepreneurs seeking funding. All this in an environment of trust, business and financial advice. Also noteworthy is the organization of European events and projects related to sustainability funding, as is the case of the Climate-KIC program.

In the light of the above, it has been observed that PCUV supports entrepreneurs in the process of sustainable entrepreneurship, complying opportunity recognition, development and exploitation of sustainable research (Belz & Binder, 2017). The PCUV has an aligned mission, vision and values to the triple bottom line solution, and its final aim enhance the foundation of a sustainable start-ups and the entry of new sustainable markets (Bocken, 2015).

The case of PCUV could be taken as a reference to increase the development of sustainable entrepreneurship in other European academic ecosystems, which share similar characteristics to our case study. Furthermore, the four cases exposed can be taken as paradigmatic ways of venturing in a context of sustainable and technological entrepreneurship.

In order to provide the reader with further research lines it would be interesting to do a European comparison of entrepreneurship academic ecosystems. The case of PCUV would be taken as the Spanish example and may be engaging to do some benchmarking with Lulea University (Sweden) Vienna University of Economics and Business (Austria) or Oxford University (United Kingdom). The Universities are characterized for being the top ones in entrepreneurship knowledge spill over and competitive entrepreneurship environments. This future work will benefit the Parc Cientific of the University of Valencia because the success practices implemented abroad could be also adopted in order to strengthen weaknesses.

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HOW DO MULTICULTURAL WORK ENVIRONMENTS AFFECT SATISFACTION AT THE WORKPLACE? A FUZZY-SET QUALITATIVE COMPARATIVE ANALYSIS METHODOLOGICAL APPROACH

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José Fernando Gallego-Nicholls – Helena Mogorrón-Guerrero

Abstract

Purpose: A large number of studies evidence the relationship between work and well-being, establishing that occupational stress affects employee well-being whereas good job performance seems to lead to higher well-being. Considering the dynamic and constant transformations imposed on the workplace by ethnic and cultural diversity, globalization and continuous technological changes, this study aims to assess the impact of multicultural work environments on immigrant employees' well-being, in Spain.

Design/methodology/approach: A representative sample of immigrants will be assessed on their degree of satisfaction with communication and their well-being. Employees are provided by non-profit associations that are part of the Strategic Citizenship and Integration Plan developed by the Government of Spain. Finally, data will be analyzed through fuzzy-set Qualitative Comparative Analysis (fsQCA).

Findings: With the obtained data, it is expected to analyze the influence of work environments composed of people from different cultures on internal communication and on well-being, the interrelations among variables and the configurations that have the most significant impact on well-being.

Research/practical implications: This study has high implications among recruiters, policy makers and companies in general, since it provides key aspects that are positively affected by multicultural work environments.

Originality/value: Few studies explore how organizations approach their adjustment to multicultural issues such as cultural stereotypes, language barriers and the acculturation process of employees, while considering well-being in the multicultural workplace.

Keywords: well-being, language, communication, corporations

JEL Codes: M5, I31

Introduction

The new global economy brings along continuously changing organizational structures. It is increasingly common to find culturally diverse work environments comprised of workers of more than one ethnicity, nationality, religion and / or culture. These types of multicultural environments are characterized by language barriers, differences in cultural values and complex acculturation processes, leading to high levels of occupational stress (Popescu et al., 2018).

Hence, use of language deserves special attention because of its impact on communication in the organizational environment. Research shows that communication satisfaction is an indicator of overall job satisfaction (Munzel et al., 2018), work performance and motivation, given that it is through communication that employees learn to do their job, understand organizational standards and receive feedback on their performance. On the other hand, dissatisfaction with communication, or its poor quality, can lead to low quality feedback, absenteeism, exhaustion or employee stress and greater staff turnover (Pettit et al., 1997). Satisfaction at the workplace is defined as the overall response to the employee to the organization and company, in terms of the individual's emotional status and behavior. Satisfaction also measures to which extent there is a good individual-organization fit (Chou et al., 2019).

In this regard, and given the impact of communication on well-being, companies have invested in updating communication tools such as global intranets, videoconference hardware and software, and email networks. In addition, the global integration of computer systems and technologies has contributed to making information flow faster, more easily and safely. However, these tools have been ineffective when language becomes a barrier.

This article presents an ongoing investigation whose main objective is to know the mediating effect of internal communication practices on employee welfare and organizational performance. Specifically, it is intended to test the hypothesis that communication, through mastery of the organizational language, influences the well-being of employees in multicultural environments, and that it has a positive impact on organizational results such as satisfaction. First, the most relevant theoretical concepts will be addressed. Secondly, the methodology that will be used to carry out the research will be described. Finally, the main findings that are expected to be found with the investigation will be explained.

1. Theoretical background

1.1 Well-being

We can refer to the ***well-being of employees (WB)*** as the quality of experience and work performance of an employee (Megeirhi et al., 2018). Or as successful development at the physical, cognitive and socio-emotional levels. In any case, it is indicative of the quality of life determined by elements related to health, social adjustment, satisfaction in relationships or professional success among others.

In this sense, research describes well-being (WB) in work environments from a three-dimensional approach. The first dimension considers satisfaction and commitment as determining elements, focusing on subjective experiences and work performance. The second considers WB from the perspectives of physical and psychological health of the worker. It refers to elements such as stress, anxiety or job exhaustion. Finally, the social welfare dimension (Munzel et al., 2019) focuses on the interactions generated in work environments and their quality among employees, employees and supervisors, or with the organization (for example: cooperation, organizational support or social exchange).

In this case, the focus is placed on the relational dimension, that is, organizational support and social exchange (Sjödin, 2019) within an organization or organizational trust.

1.2 Communication

In the field of organizational behavior, there has been rather scant attention to how organizational contexts influence specific areas of individual and group behavior, including communication.

Organizational communication can be defined as the process by which members gather relevant information about their organization and the changes that occur within (Hussain et al., 2018). Internal communication practices cover all types of communication activities, both formal and informal (Gama, 2019), to disseminate information in the organization. And although it can be of the descending, horizontal or ascending type, it is the managerial responsibility to guarantee an effective and efficient internal communication system with timely and salient information. "*Effective communication strategies involve aligning employees via formal organizational boundaries and diverse ways in which employees and managers can communicate and organize meaning with respect to their work*" (Chen, et al., 2011 p.336). In this sense, communication meets two objectives at the organizational level: to inform employees about their tasks and the organization's policy, and to generate a community within the organization (Nam, 2019).

Research on internal communication addresses how members of an organization exchange information and its effects at all levels. At present, it turns out to be a topic of interest for the complexity of modern organizations, subject to diverse and changing environments and to the integration of communication systems, subject to new information technologies (Barnett et al., 2019). In this vein, organizations invest resources to develop effective and efficient internal communication systems that facilitate the communication of relevant and timely information to employees. Evidence also argues that there is a positive relationship between the time devoted to communication and the effort and job satisfaction of employees (Yammarino and Naughton, 1988), thus highlighting the importance of communication for management. The type of office also determines the level of communication among employees. For example, nowadays open spaces understood as coworking areas foster free flows of communication (Orel & Dvouletý, 2020).

1.3   Well-being and communication.

Evidence shows a positive relationship between internal communication practices and employee satisfaction. Employees with high levels of communication satisfaction, with personal feedback and communication climate, tend to be more satisfied with their employment status (Ali et al., 2018).

Communicational satisfaction of the employee can be understood as the affective assessment of the organization's communication practices (Zeeshan et al., 2019). It is a multidimensional construct in which eight dimensions can be identified: climate of communication, communication with supervisors, organizational integration, quality of media, horizontal and informal communication, organizational perspective, personal feedback, and communication with subordinates.

1.4   Multicultural environments and communication.

The increase in internationalized business environments has made diversity management a challenge (Lara et al., 2019). Understanding diversity in the workplace as all differences in age, gender, sexual orientation, education, cultural background, religion and life experience (Grzegorczyk, 2019). Research shows its importance, evidencing the relationship between diversity and organizational performance. For example, demographically diverse groups are better at problem-solving tasks and more creative than homogeneous groups. It has also been seen that companies open to under-represented groups significantly outperform other companies in the same sector. However, despite the creativity and satisfaction of culturally

diverse groups, they incur losses apparently because they present greater conflict of tasks and less social integration.

In this sense, organizations that develop in international environments face the challenge of communicating more effectively for organizational success (Guijarro et al., 2019) and sustainable growth (Mulkeen, 2008). Some studies have highlighted the impact of communication in a diverse workplace and how it affects productivity and overall performance in a company, thus being essential for having and sustaining competitive advantage. That is, it is difficult to increase the productivity of a diverse workforce without effective communication, including interpersonal communication, intercultural sensitivity, differences in business practices and competition in nonverbal communication, particularly in teamwork environments that depends largely on the understanding of messages, the exchange of meanings, interpersonal adjustments and adaptations.

Consequently, this study considers the following working hypotheses:

H1. Multicultural work environments have negative effects on the internal communication of the organization, due to lack of command of the organization's vehicle language.

H2. Internal communication practices have a positive effect on well-being in multicultural environments.

H3. The well-being of workers in multicultural work environments has positive effects on organizational results, specifically on satisfaction.

H4. Multicultural work environments reduce satisfaction, motivated by the lack of mastery of the vehicular language of the work environment.
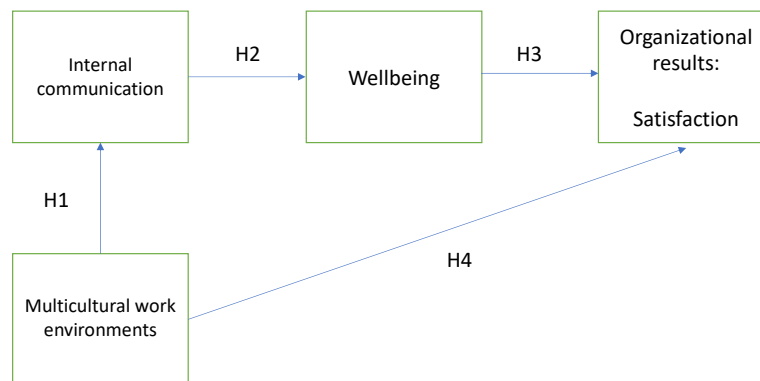
2. Methodology

2.1 Sample

For our study, we will take as sample, employees from other cultures and nationalities that work in companies in the territory of the Valencian Community in Spain. We will collect this data through non-profit associations that are part of the Strategic Plan of Citizenship and Integration developed by the Government of Spain, whose backbone is equality, citizenship, interculturality and the inclusion of immigrants.

2.2 Design

The study will be carried out by collecting assessment questionnaires from multicultural employees with the aim of investigating communication and job satisfaction and their association with well-being. The assessment questionnaires to be employed in the study are taken from the literature. They are the following: Satisfaction related to communication evaluated by the Satisfaction with Communication Questionnaire (CSQ) (Downs and Hazen, 1977), the intention of abandonment through the Intention of Rotation Scale (from the Perception and Work Evaluation Questionnaire), the psychological well-being through the Oxford Happiness Questionnaire (OHQ) and job satisfaction with the Minnesota Job Satisfaction Questionnaire (MSQ).

2.2. Data analysis

In this research, we will use the fsQCA methodology. This is a new approach used increasingly used lately in business management studies, with the purpose to identify different combinations of conditions that have an implicit causal relation, and that are sufficient to explain a final outcome. In this study, the outcome is satisfaction. One of the criteria that influence the decision of taking this methodology is because it allows to run the system with a small number of cases while preserving reliability. The piece of software to be used is fs/QCA 3.0.

Conclusion

The new business reality awakens the need to develop intercultural competence in the workplace. It is essential that organizations prepare their human capital for the globalized economy in which success is determined in part by the ability to communicate effectively across cultures. The current and increasingly diverse workforce poses challenges in the internal communication of the work environment, such as skills, traditions, backgrounds, experiences, perspectives and attitudes towards work, which may affect the quality of communication. Therefore, top and middle managers face the challenge of generating healthy work environments. Programs focused on well-being can therefore become a way to raise and increase awareness thereof, to increase the company's commitment to employee well-being by

promoting their happiness, as well as to help employees manage their stress. For this reason, this study aims to assess the impact of multicultural work environments on immigrant employees' well-being, in Spain. On the one hand, previous studies show that communication satisfaction is an indicator of overall job satisfaction, work performance and motivation. On the other hand, dissatisfaction with communication, or its poor quality, can lead to low quality feedback, absenteeism, exhaustion or employee stress and greater staff turnover. Studying the consequences of language implications on the workplace therefore are interesting not only for the employees themselves, but also for the middle and top management positions, as well as for policymakers and practitioners.

It is crucial to identify those dimensions of work that influence the quality of work experience in these changing multicultural environments. This is the case of immigrant workers, who must face, on the one hand, the acculturation processes that are associated with the acquisition of communication skills necessary for proper performance in the workplace. And on the other, to cope with the specific characteristics of the work environment and its different demands according to the job position. This study aims to explore how organizations adapt to multicultural issues such as language barriers in the process of acculturation of employees. With the analysis of immigrant employee well-being, it is intended to demonstrate the importance of working as a mediator to counter stress and increase satisfaction in the organizational environments where workers with multiple ethnicities and cultures coexist.

Regarding the theoretical implications of the study, we can highlight the advancement in the literature of business management related to the satisfaction of employees' in the workplace, taking into account a multicultural context. A high relevance is given to communication and how it influences the overall employees' satisfaction. For this reason, this study has a multidisciplinary nature, including different areas of knowledge that are complementary. Regarding the practical implications, recruiters, policy makers and companies in general could benefit from this study, since it provides key aspects related to satisfaction at the workplace that are positively affected by multicultural work environments. It drives also attention over the best practices to follow in order to achieve greater efficiency in communication.

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INCLUSIVE ENTREPRENEURSHIP IN THE SELECTED CEE COUNTRIES: DO CONTEXTUAL AND FRAMEWORK CONDITIONS MATTER?

Anna Pilková – Juraj Mikuš – Ján Káčer

Abstract

Purpose: The paper covers the knowledge gap on inclusive entrepreneurship of women, youth and seniors in CEE countries from three perspectives: a/ a level of inclusive entrepreneurship both in CEE and Western European countries, b/ identification of significant differences between key drivers of inclusivity in CEE and Western European countries c/ influence of attributes and framework conditions on the inclusivity development in CEE countries.

Design/methodology/approach: We employ the Global Entrepreneurship Monitor (GEM) data (both APS – adult population survey and NES – national expert survey data). A pooled sample of individual-level APS GEM data of 30 European countries for 2011 to 2017 is used. The study is divided into 3 phases: 1/ we analyse data from our own developed TEA inclusivity index 2/ we applied the Mann-Whitney Wilcox U test to determine the differences between CEE and Western Europe; 3/ we conducted correlation and regression analysis to investigate the relationship between TEA inclusivity indices and observed variables in CEE.

Findings: Our findings confirm a common pattern of the inclusivity in CEE and Western Europe, as far as a group involvement is: the highest level of entrepreneurial involvement is exhibited by youth and the lowest by seniors. Women perform in between these groups. We also found out that the level of involvement of women and seniors in Western European countries is much higher than in CEE, while the opposite is valid for youth. We discovered that the selected personality traits are significant for the development of women and youth inclusivity, but for all studied groups, contextual variables, as well as framework conditions, are also very important, which confirms the findings of a few previous studies.

Research/practical implications: We came up with specific policy and research-related recommendations related to inclusive entrepreneurship in CEE.

Originality/value: We believe that our paper offers an original value by providing unique insights on the inclusivity of entrepreneurial activities in CEE countries.

Keywords: inclusive entrepreneurship, inclusive growth, entrepreneurial activity, CEE countries

JEL Codes: L26, R12, J01

Introduction

Entrepreneurship is a significant component of the growth and development in the modern economy. However, to fully exploit this component is a multidimensional issue. One of the topics in the discussion is how to use entrepreneurship in inclusive and sustainable growth and development. This concept of inclusive growth and development is studied worldwide and attracts the attention of both academicians and policymakers. Nowadays, its importance is also affected by demographic, social and cultural problems that are complex and ask for an interdisciplinary approach to their solution.

In this respect, the concept of inclusive growth is essential. Its importance has also been recognized by the World Economic Forum that introduced the Inclusive Development Index (IDI) in 2017. IDI is a composite index that ranks countries based on a composite indicator. It presents a new economic policy framework and a performance metric. Results of the measurements are available at the Inclusive Growth and Development Reports. The framework of this index identifies 15 areas of structural economic policy and institutional strength, that have the potential to contribute simultaneously to the higher growth and wider social participation in the process and benefits of such growth. According to the World Economic Forum and IDI (World Economic Forum, 2017), the inclusive growth consists of even distribution of benefits, from the economic growth among various participants of economic activity and also in the creation of opportunities for inclusion of as many as possible interested persons in the process of GDP creation. This action has also confirmed that the world recognized the importance of a socially inclusive approach to generating economic growth and wealth.

In this process, the importance of inclusive entrepreneurship is inevitable. The involvement of less represented groups in the process of inclusive growth has been influenced by many factors, among which are individual characteristics of population, national and regional differences in entrepreneurship and ecosystems, particularly its entrepreneurial policies and programs. While numerous papers are focused on studying entrepreneurship differences from national and regional perspectives, not many of them study inclusive entrepreneurship and a significant gap is also in the research of differences between Western European countries and former Soviet bloc regions.

To fill this gap, the main goal of this paper is to investigate inclusive entrepreneurship from perspectives of its level both in CEE and Western European countries, significant

differences between key drivers of inclusivity attributes of CEE and Western European countries and framework conditions and the influence of attributes and framework conditions on the inclusivity development in CEE countries. To complete this goal, we formulated three research questions: l. What is a level of entrepreneurial inclusivity of the less represented groups of population (women, seniors, and youth) in the selected Central and Eastern European countries (CEE, former East bloc countries) and Western European countries; 2/ In which attributes/key drivers and framework conditions are CEE countries significantly different in comparison to Western European countries? 3/ Which attributes/key drivers and framework conditions are significant for the inclusivity of each studied group (women, seniors, and youth) in CEE countries?

1. Literature Review

Inclusive entrepreneurship represents an involvement of under-represented or disadvantaged groups in entrepreneurial activities, by unleashing their creative potential towards economic self-sufficiency, which is beneficial for themselves and society (Pilková et al., 2017). In theory, inclusive entrepreneurship as a concept and a practice is motivated by the assumption of the equality of opportunities reached by everyone in society (Amaro da Luz, 2014). In some research papers is stated that inclusive entrepreneurship is about a set of attitudes, competencies, and skills that may represent more than just starting an individual business (Henriques and Maciel, 2012). But according to theory (Gartner, 1988) to take into consideration only personal traits is not enough. Many authors study youth, women, and seniors from perspectives of their entrepreneurial skills and their entrepreneurial activities (Ajzen, 1991; Kautonen et al., 2008; Kilber et al., 2011; Holienka and Holienkova, 2014; etc.), however, as Henriques and Maciel (2012) stressed in their work, inclusive entrepreneurship depends highly on cultural and historical traditions of nations.

In this respect, it is important to study inclusive entrepreneurship from national as well as regional perspectives. There is no doubt that entrepreneurship is related to regional growth and development (see Fritsch, 2013). According to the Fritsch and Wyrwich research (2017, p. 158, 159), little is known about those region-specific factors that are more intangible or 'in the air', such as a regional 'spirit' or a 'culture of entrepreneurship'. They explain a culture of entrepreneurship as norms, values, and codes of conduct that promote social acceptance and approval of entrepreneurial activities. Tominc et al. (2015) stated that favourability of entrepreneurship in the culture is associated with the level of entrepreneurial activity in the form of start-ups attempted, with supportive cultures leading to higher start-up rates and

entrepreneurial activity in general. It is also found that historically grown cultural differences can persist over long periods of time and may explain differences in economic development (Fritsch and Wyrwich, 2017).

Applying these findings on Central and Eastern European countries, that usually are characterized by emerging markets, less stable political systems, still weaker entrepreneurial ecosystems and comparing them with developed countries, it is rational to study whether there are differences also in the field of inclusive entrepreneurship and applied governmental programs and policies (see Dyba et al., 2018). According to Stam (2015, p. 1766) "the systemic conditions are the heart of the ecosystem: networks of entrepreneurs, leadership, finance, talent, knowledge, and support services. The presence of these elements and the interaction between them predominantly determine the success of the ecosystem." As Malecki (2017) suggests, entrepreneurial ecosystem definitions highlight the combination or interaction of elements, often through networks, producing shared cultural values that support entrepreneurial activity. In these systems, governmental policies and programs are important as well as to study their impact on inclusive entrepreneurship in different socio-economic systems. In the context of previous research and theoretical findings, we have further studied the inclusivity of entrepreneurial activities of women, youth and seniors with a special focus on CEE countries.

2.   Methodology and Data

We employ the Global Entrepreneurship Monitor (GEM) data (both APS – adult population survey and NES – national expert survey data). A pooled sample of individual-level APS GEM data of 30 European countries (see in Tab. 2) for the period of 2011 to 2017 is used. The sample comprises of 527 462 adult population individuals (218 047 youth – 18 to 34 years old, 113 250 seniors – 55 – 64 years old, and 304 790 women) and is weighted to be representative for gender, age, and regional distribution. The study is divided into 3 phases:

1st phase: we analyse a level of inclusive entrepreneurship of youth, women, and seniors for each of 30 European countries applying our own developed TEA inclusivity index which calculation is the following:

$TEAIj_k$ is the summary inclusivity index of individual category j of the 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:

$$TEAI_{jk} = (\sum_{i=1}^{n} TEAI_{jki})/n$$

$TEAI_{jki}$ - the TEA inclusivity index in the year i, for a particular category of the population j in a region k is calculated as follows:

$$TEAI_{jki} = (TEAjki/TEAki)$$

Where $TEAki$ – the percentage of the population 18 - 64 who are nascent or new business owners (up to 42 months' businesses); $TEAjki$ is the percentage of the population of a particular category j (women, youth, seniors) in a region k and year i.

2nd phase: we apply the Mann-Whitney Wilcox U test to determine whether the differences of entrepreneurial activity drivers and variables of governmental policies and programs between CEE countries and Western European countries are significant. The investigated variables are explained in Tab.1.

Tab. 6: TEA Inclusivity Index and Explanatory Variables

TEA inclusivity index ($TEAjki$)	The percentage of the population of particular category j (women, youth, seniors) in region k and year i.
Personality traits variables	
Opportunity perception (opport)	In the next six months, will there be good opportunities for starting a business in the area where you live?
Perception of abilities (suskill)	Do you have the knowledge, skill, and experience required to start a new business?
Fear of failure (fearfail)	Would fear of failure would prevent you from starting a business?
Contextual variables	
Knowing an entrepreneur (knowent)	Do you know someone personally who started a business in the past 2 years?
Preference of the same standard of living (equalinc)	In my country, most people would prefer that everyone had a similar standard of living.
Entrepreneurship as a good career choice (nbgoodc)	In my country, most people consider starting a new business as a desirable career choice.
Perception of a successful entrepreneur (nbstatus)	In my country, those successful at starting a new business have a high level of status and respect.
Media attention (nbmedia)	In my country, you will often see stories in the public media and/or internet about successful new businesses.
Framework conditions	
Government concrete policies, priority and support	Conditions for entrepreneurship characterizing the area of government policies in relation to entrepreneurship in terms of prioritization and support of entrepreneurship
Government policies bureaucracy, taxes	The administrative and tax-paying burden on business
Government programs	Availability of governmental programs, science parks and business incubators aimed at supporting new firms and their competencies

Source: Elaboration by authors.

3rd stage: we conduct correlation and multiple linear regression analysis to investigate the relationship between TEA inclusivity indices of CEE countries and observed variables. We constructed the following separate models for each observed group (women, youths, seniors)

for the CEE group of countries through which we studied the relationship between dynamics of inclusivity indices and dynamics of explanatory variables.

$$\Delta TEAI_{jki} = f\,(\Delta \text{ Personality Traits }_{(j)}, \Delta \text{ Contextual Variables}_{(j)})$$

$$\Delta TEAI_{jki} = f\,(\Delta \text{ Framework Conditions})$$

3.   Results and Discussion

To answer the first question "What is a level of entrepreneurial inclusivity of the less represented groups of the population (women, seniors, and youth) in the selected CEE countries and Western European countries" we have applied descriptive statistics analysis.

Analysed CEE and Western European countries indices for observed groups of the population from 2011 to 2017 are presented in Tab. 2.

Tab. 7: Inclusivity indices of CEE and West European countries (average for 2011-2017)

	Women	Youth	Seniors		Women	Youth	Seniors
CEE	**0.68**	**1.30**	**0.41**	Belgium	0.67	1.10	0.58
Russia	0.86	1.28	0.35	France	0.66	1.14	0.54
Hungary	0.66	1.09	0.53	Spain	0.83	1.09	0.48
Romania	0.68	1.30	0.44	Italy	0.65	1.23	0.55
Poland	0.69	1.39	0.49	Switzerland	0.85	0.80	0.76
Lithuania	0.62	1.43	0.32	Austria	0.83	1.21	0.46
Latvia	0.70	1.42	0.32	United Kingdom	0.70	1.03	0.69
Estonia	0.74	1.42	0.36	Denmark	0.63	1.11	0.52
Croatia	0.65	1.36	0.43	Sweden	0.73	0.96	0.86
Slovenia	0.62	1.34	0.44	Norway	0.62	0.86	0.84
Bosnia and Herzegovina	0.65	1.36	0.39	Germany	0.73	1.20	0.52
Macedonia	0.59	1.18	0.34	Turkey	0.61	1.16	0.41
Slovakia	0.71	1.06	0.55	Portugal	0.74	1.20	0.52
Western European countries	**0.71**	**1.09**	**0.61**	Luxembourg	0.74	1.15	0.61
Greece	0.75	1.05	0.63	Ireland	0.65	1.03	0.72
Netherlands	0.73	1.20	0.56	Finland	0.74	1.07	0.64

Source: GEM 2011-2017, elaboration by authors; No. of observations in CEE – 130,589; WEC – 380,075.

According to obtained results, it is apparent that CEE countries compared to Western European countries exhibit lower inclusivity indices for women and seniors, while higher for youth. It is also evident that inclusivity is varying across analysed countries as well as among different groups of the population. Senior´s engagement in entrepreneurship is the lowest compared to youth and women (the average inclusivity index for CEE countries is 0.41) in both CEE countries and Western European countries. Considering CEE countries, the most active seniors in terms of entrepreneurship are in Slovakia and Hungary while seniors in Lithuania, Latvia and also in Macedonia are the least active. In Western Europe, senior´s entrepreneurial

activity is peaking in Sweden and Norway, while they engage the least in Turkey. Women get involved in entrepreneurship more compared to seniors (the average inclusivity index for CEE countries is 0.68). They reach the highest level of inclusivity index in Russia and the lowest in Macedonia as well as in Lithuania and Slovenia. For Western European countries, women exhibit the highest inclusivity index in Switzerland, Spain, and Austria and the lowest in Norway and Turkey. Youth inclusivity index is in all cases above 1 except for Switzerland, Norway, and Sweden which means that their engagement in entrepreneurship is higher compared to the overall population (the average inclusivity index in CEE countries is 1.30, in Western Europe 1.09). While youth excel at entrepreneurship in Baltic countries (Lithuania, Latvia, Estonia) they are the worst off in Hungary and Slovakia. For Western European countries, youth are the most entrepreneurially active in Italy.

To study the question "In which attributes/key drivers and framework conditions are CEE countries significantly different in comparison to Western European countries" we have applied the Mann-Whitney Wilcox U test. We studied whether differences are significant for the level of inclusivity, personal traits, contextual variables, and framework conditions. The significant differences between CEE and Western European countries for all studied groups are presented in Tab. 3.

Tab. 8: The Mann-Whitney Wilcox U test – differences between CEE and Western European countries

	Women	Youth	Seniors
TEA index	W = 2817, p-value = 0.007377, obs. = 304790	W = 6192, p-value = 2.179e-13, obs. = 218047	W = 1585, p-value = 2.345e-10, obs. = 113250
Personality traits variables			
Opportunity perception	W = 2771, p-value = 0.004864, obs. = 243630	W = 3183, p-value = 0.1112, obs. = 179297	W = 2181.5, p-value = 4.971e-06, obs. = 90396
Perception of abilities	W = 4893, p-value = 0.0004997, obs. = 293471	W = 5632, p-value = 1.388e-08, obs. = 209536	W = 3499, p-value = 0.5127, obs. = 109554
Fear of failure	W = 3562, p-value = 0.6401, obs. = 68098	W = 2495.5, p-value = 0.0002793, obs. = 60317	W = 4492.5, p-value = 0.02191, obs. = 24501
Contextual variables			
Knowing an entrepreneur	W = 4216, p-value = 0.1413, obs. = 300913	W = 4906, p-value = 0.0004324, obs. = 215380	W = 3417, p-value = 0.3692, obs. = 111573
Preference of the same standard of living	W = 3484, p-value = 0.009098, obs. = 242959	W = 3631.5, p-value = 0.001587, obs. = 174552	W = 3255, p-value = 0.07936, obs. = 90363
Entrepreneurship as a good career choice	W = 4493, p-value = 1.026e-05, obs. = 257020	W = 4390, p-value = 4.794e-05, obs. = 188562	W = 4361, p-value = 7.248e-05, obs. = 93926
Perception of a successful entrepreneur	W = 2156, p-value = 0.000335, obs. = 262896	W = 2186, p-value = 0.0004879, obs. = 191514	W = 2045.5, p-value = 7.736e-05, obs. = 96621
Media attention	W = 2854, p-value = 0.3647, obs. = 254938	W = 3223, p-value = 0.7264, obs. = 185877	W = 1831, p-value = 1.088e-05, obs. =94063
Framework conditions			
Government concrete policies, priority and support	W = 2278.5, p-value = 5.884e-05, obs. = 6624		
Government policies bureaucracy, taxes	W = 2121, p-value = 6.899e-06, obs. = 6624		
Government programs	W = 2160, p-value = 1.197e-05, obs. = 6624		

Source: Elaboration by authors.

Results of the Mann-Whitney Wilcox U test (Tab. 3) confirmed that TEA inclusivity indices between CEE and Western European countries are significantly different for all studied groups. Only the group of youth exhibit higher inclusivity at entrepreneurial activity in CEE countries compared to Western Europe. On the contrary, women´s and senior´s inclusivity in CEE countries is significantly lower. Women, who have lower entrepreneurial engagement in CEE countries, further exhibit lower opportunity perception and do not consider entrepreneurs to have a high status in society in this context. On the other hand, they are more self-confident in their abilities, consider entrepreneurship as a good career choice but to a higher extent prefer the same standard of living for everyone. Our findings also confirmed the significant differences between seniors in CEE and Western Europe, particularly the lower level of entrepreneurial engagement in CEE countries. Seniors in CEE countries are significantly worse at opportunity perception, perception of successful entrepreneurs and media attention towards entrepreneurship. However, they consider entrepreneurship as a good career choice although

they have a higher fear of failure. Finally, the significantly higher youth´s inclusivity index has been confirmed for CEE countries, which seems to be supported by the most entrepreneurial activity drivers. Even though the opportunity perception is similar to that exhibited by their peers in Western European countries, seniors in CEE countries are more self-confident and they have a better entrepreneurial network. They also consider entrepreneurship as a good career choice and have a lower fear of failure. At the same time, they have a higher preference of the same standard of living and most importantly, don't perceive that successful entrepreneurs have a high status in society, which is the shared feature for all observed groups.

Very important results are obtained from studying the differences between CEE and Western Europe in framework conditions. All three studied framework conditions are significantly lower in CEE countries in comparison to Western Europe. It may indirectly explain still underdeveloped entrepreneurial ecosystems in CEE countries, that has also an impact on a lower level of entrepreneurial inclusivity support of some groups of the population. In the next step, to better understand the impact of key inclusivity drivers we also investigate the significance of framework conditions on the inclusivity of the selected groups of the population in CEE countries.

To answer the research question "Which drivers/attributes and framework conditions are significant for the inclusivity of each studied group (women, seniors, and youth) in CEE countries?" we created 6 separate models (see above in the methodology). We have applied a correlation and multiple linear regression analysis to investigate the relationship between annual changes of TEA inclusivity indices and annual changes of observed variables in CEE countries.

Tab. 9: Relationship between dynamics of inclusivity indices of women, youth, and seniors and dynamics of Personal Traits and Contextual Variables

WOMEN/ Coefficients	No. of obs.	Estimate	Std. Error	Signif. Code
(Intercept)		-0.0001451	0.0150818	
Women Knowing an entrepreneur	304790	1.7718875	0.3282958	***
Women Entrepreneurship as a good career choice	304790	0.3111176	0.1782585	.
Women Media attention	304790	-0.3847465	0.2170738	.
Women Fear of failure	304790	0.3333587	0.1597639	*
YOUTH/Coefficients	**No. of obs.**	**Estimate**	**Std. Error**	**Signif. Code**
(Intercept)		-0.04947	0.02881	.
Youth Opportunity perception	218047	1.20879	0.34084	***
Youth Knowing an entrepreneur	218047	1.92856	0.34944	***
SENIORS/ Coefficients		**Estimate**	**Std. Error**	**Signif. Code**
(Intercept)		-0.00850	0.02456	
Senior Knowing an entrepreneur	113250	1.95188	0.44583	***
Senior Entrepreneurship as a good career choice	113250	-0.60113	0.26972	*
Senior Media attention	113250	0.55832	0.30419	.
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				

Source: Own elaboration by authors.

The inclusivity of all three groups of the population in CEE countries (Table 4) is highly influenced by contextual variables, particularly by "knowing entrepreneurs" which in the theory relates to network factors. Numerous research studies confirm the importance of networks for starting entrepreneurial activities. Our findings confirm this affirmation, too. While the other studied contextual factors (nbgoodc – entrepreneurship as a good career choice, and nbmedia – frequent presentation of successful business stories in media) are also significant for seniors and women, the inclusivity of youth is significantly influenced only by a very important personality trait – opportunity perception. However, entrepreneurship as a good career choice harms senior´s engagement in entrepreneurial activities which is similar for women in case of media attention towards entrepreneurship. The women´s inclusivity is also influenced by fear of failure.

In terms of governmental policies and programs in CEE countries, we have found a significant influence on TEA inclusivity index dynamics only in the case of women and youth. Women´s entrepreneurial engagement is supported by governmental programs focused on entrepreneurship, such as assistance for new and growing firms, availability of science parks and business incubators, etc., while youth are more sensitive to governmental policies in relation to entrepreneurship in terms of its prioritization and support. It looks like seniors start their entrepreneurial activities regardless of support government policies or programs.

Tab.5: Relationship between dynamics of inclusivity indices of women and youth and framework conditions (governmental policies and programs)

WOMEN/Coefficients	No. of obs.	Estimate	Std. Error	Signif.
(Intercept)		0.004937	0.018846	
Government programs_diff	6624	0.258099	0.020099	***
YOUTH/Coefficients	**No. of obs.**	**Estimate**	**Std. Error**	**Signif.**
(Intercept)		0.02834	0.02918	
Government concrete policies, priority and support_diff	6624	0.51804	0.03159	***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				

Source: Elaboration by authors.

Conclusion

Inclusive entrepreneurship is one of the hot topics for both academics and politicians, particularly due to its role in inclusive growth. According to previous research studies, not only personal attributes but also regions and their socio-economic development matters as far as entrepreneurship development is concerned. Taking into consideration these perspectives in our paper, we studied differences between CEE and Western European countries in the level and significance of differences in the inclusivity of women, youth, and seniors. We further studied in more detail the significance of impacts of personal traits, contextual factors, and framework conditions on the level of inclusivity in CEE countries. Our findings confirm a common pattern of inclusivity in CEE and Western Europe as far as group involvement is: the highest level of entrepreneurial involvement is exhibited by youth and the lowest by seniors. Women perform in between these groups. We also found out that the level of involvement of women and seniors in Western European countries is much higher than in CEE, while the opposite is valid for youth. We also discovered that the selected personal traits are significant for the development of women and youth inclusivity. However, if we put together the contextual variables and framework conditions then it is clear that they all influence the inclusivity of all three studied groups. It confirms the findings of previous studies that personal traits are not enough for the development of entrepreneurship and that the development of entrepreneurial ecosystems is very important (Stam, 2015, Malecki 2016). The originality and added value of this paper are in the practical implications for policymakers. To increase the inclusivity of particular groups of population in CEE countries, the governmental policies and programs should especially focus on: a/ a formation of business networks and their promotion among all studied groups; b/ the improvement of social attitudes towards entrepreneurship such as perception of entrepreneurship as a good career choice, high social status of successful entrepreneurs, as well as promoting successful entrepreneurial stories in media; c/ promoting opportunity perception

for all studied groups, especially for youth as it is a significant driver of their entrepreneurial activity. Relevant policies and programs are important drivers to support entrepreneurial inclusivity of the less presented groups that again is important to improve inclusive economic and social growth.

Our study is not without limitations, that at the same time outline areas for future research. First, we used a simple correlation and multiple linear regression analysis which could be supplemented by panel regressions of individual countries. Second, in our study, we did not control the model for age and gender which would versatile GEM data allow even though they were already considered in the created groups of the population. Finally, our study was based on GEM data and incorporating more variables into the analysis, such as economic, cultural and environmental could bring more insights on inclusivity dynamics in different contexts.

Acknowledgement

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CROWDFUNDING: THE MODERATING ROLE OF THE FUNDING GOAL ON FACTORS INFLUENCING PROJECT SUCCESS

Felix Pinkow – Philip Emmerich

Abstract

Purpose: The factors determining the success of crowdfunding projects is one of the central aspects for crowdfunding researchers. Most quantitative approaches recognize the amount of funds targeted as an important control. However, little is known about the impact of the funding goal on other factors that impact crowdfunding success. We hypothesize that the effect of crowdfunding success factors might vary dependent on funding goal level.

Design/methodology/approach: A dataset of 338 crowdfunding projects on the German crowdfunding platform StartNext, with a vast majority of projects founded in Germany and a few projects from international European founders, in the years 2015 to 2016 is analysed by conducting regression analyses controlling for varying funding goal sizes. We use the dependent variables success, the degree of success, number of project supporters and the average contribution per supporter and control whether the effect of independent variables such as comments, updates and social media depend on different funding goals.

Findings: Our study indicates that the impact of the investigated success factors in fact strongly depends on the goal sizes of crowdfunding projects. By grouping projects into clusters of varying funding goal sizes, we find that the impact of individual success factors changes and that the funding goal plays a moderating role for factors impacting project success.

Research/practical implications: These results help both researchers and future entrepreneurs to better understand supporter behaviour. First, we suggest researchers to include the projects' funding goals as moderators in most cases especially when assessing success factors for crowdfunding projects. Second, future entrepreneurs should be aware that factors influencing the success of a crowdfunding project strongly depend on the set funding goal. Depending on funding goal, some factors become less relevant whilst other factors' importance is increasing.

Originality/value: The funding goal of a crowdfunding project determines whether instruments used by project founders have an impact on their project's success. Although the funding goal is a central issue in crowdfunding research, it is often used as independent variable, in contrast we suggest incorporating it as a moderator for other success factors.

Keywords: crowdfunding, success factors, reward-based, start-up, entrepreneurial financing

JEL Codes: M13, L26, G24

Introduction

The right choice among the numerous opportunities of financing new businesses is central to the future development of nascent entrepreneurs' ideas. Whilst traditional financing forms such as bank loans or funding by venture capitalists are well-established, crowdfunding emerged in the last decade as a new possibility to finance ideas on new products, services or technologies. Among the many forms of crowdfunding, such as equity-based, pure donation-based, or profit-sharing crowdfunding, this study focuses on *reward-based* crowdfunding, which refers to finance 'a project or a venture by a group of individuals instead of professional parties' (Schwienbacher & Larralde, 2010, p. 4) who in turn receive 'some form of reward' (Mollick, 2014, p. 2) varying from acknowledgments to pre-ordering the final product.

Platforms such as Kickstarter, Indiegogo or StartNext offer a variety of instruments to promote crowdfunding initiatives, for example the integration of social media platforms, embedding promotional and illustrative videos from YouTube, and the possibility to interact with the crowd, the potential contributors (also referred to as *backers, funders* or *supporters*). In this context, crowdfunding platforms act as two-sided markets, connecting project founders to a potential crowd that can provide the required funding (Belleflamme, Lambert, & Schwienbacher, 2014). The question how to design such a crowdfunding project, how much funding is required, and which factors drive the success of a crowdfunding initiative are the key questions for every entrepreneur considering crowdfunding an option to finance their ideas.

The funding goal determines the amount of funding from the crowd required for a project to be considered successful and can be set by the project founders. The project founders, however, only receive the pledged money if the funding goal was reached during the crowdfunding campaign, otherwise the funding is paid back to the crowd. Factors that impact the probability of reaching the funding goal are called 'success factors', which are central to crowdfunding research and widely investigated (Beier & Wagner, 2015; Cordova, Dolci, & Gianfrate, 2015; Kuppuswamy & Bayus, 2018). Thereby, especially the funding goal set by the project founders was identified to be relevant for success (ibid.), with an increasing funding level having a negative impact on success probability. However, the question whether and how the impact of individual success factors varies for projects with different funding goals is often neglected. Therefore, this study seeks to answer the question which success factors are moderated by the level of the targeted funding goal and how the impact of success factors varies for different levels of the targeted funding.

1.   Literature Review

1.1   Crowdfunding Success Factors

Crowdfunding received great research attention during the past years and most studies that investigate some form of impact on crowdfunding success, regardless of the specific topic, include factors established by previous research as control variables. Relevant factors which were assessed for a positive contribution to crowdfunding success in current literature are the inclusion of pictures and videos on a crowdfunding website (Koch & Siering, 2015), the number of posted updates and comments from supporters (Beier & Wagner, 2015; Kuppuswamy & Bayus, 2017), the number of founders of a crowdfunding project (Beier & Wagner, 2015), the offered rewards (Du, Li, & Wang, 2019; Zhang & Chen, 2019), and the role of social media (Datta, Sahaym, & Brooks, 2018; Thies, Wessel, & Benlian, 2014). Although the above-mentioned factors are well-researched, there is no established consensus on their effect. Some studies for example find that pictures, videos or updates are not relevant for project success (Cordova et al., 2015; Joenssen, Michaelis, & Müllerleile, 2014), and even the effect of social media is not yet fully understood and the positive effect on project success is not consistent across studies (Belleflamme, Lambert, & Schwienbacher, 2013; Koch & Siering, 2015).

1.2   Hypotheses

Previous studies often included the funding goal as independent variable in regression analyses to assess the impact of different funding levels on success. For example, Cordova et al. (2015) and Kuppuswamy and Bayus (2017) considered different levels of funding goals, but did not further elaborate differences or significance levels for projects with different funding goals with respect to individual success factors. We believe that some ambiguity of the mentioned results can be explained by controlling for different funding goal levels. While for projects with high funding goals the use of social media or videos explaining the project idea in addition to the written project description on a crowdfunding platform may be helpful, it might be different for projects with very low funding goals. Therefore, H1 is stated as follows:

> **H1:** *The funding goal size of crowdfunding projects moderates the impact of success factors on project success.*

H1 will be tested with two different dependent variables: First, projects are separated in successful and unsuccessful projects. Second, we assess the degree of success, measured by dividing the total amount of funding by the initial funding goal.

Another aspect of success is the average contribution per backer and the total amount of backers. Since attracting a sufficiently large crowd and a high contribution per backer can be

crucial for any project, we test whether success factors also differ between different funding goal sizes concerning the backers per project and the average contribution per backer. Thus, H2 and H3 are stated as follows:

> ***H2:*** *The funding goal size of crowdfunding projects moderates the impact of success factors on the backers per project.*

> ***H3:*** *The funding goal size of crowdfunding projects moderates the impact of success factors on the average contribution per backer.*

2.   Data and Methodology

Data was collected from 338 crowdfunding projects on the German crowdfunding platform StartNext. Success factors comprise the number of updates, comments, the availability of social media (Facebook and Twitter), availability of pictures and videos, the number of offered rewards to backers, the length of the project description and the amount of project founders.

Table 1: Variable Description

Variable Name	Variable Description
Cat1	Category 1: Product-related projects, includes following subcategories: Design, Invention, Technology, Science
Cat2	Category 2: Artistical Projects, includes the following subcategories: Film, Photography, Journalism, Art, Literature, Fashion, Music, Theatre
Cat3	Category 3: Social projects, includes the following subcategories: Education, Community, Event, Social Business, Environment
PIC	Availability of Picture(s) (1=yes, 0=no)
VID	Availability of Video(s) (1=yes, 0=no)
NrUpd	Number of updates on the crowdfunding page
NrCmt	Number of comments on the crowdfunding page
NrRewards	Number of rewards offered to backers on the crowdfunding page
PrjDetail	Number of words used to describe the project, indicating the level of how detailed the project is described *(Note: The number of words is divided by 100 in the regression tables for illustration)*
Goal	Targeted funding goal in €
Success	Project success (1=yes, 0=no)
Raised	Amount of total funds raised in €
DegrSucc	Degree of success = Raised / Goal
Backers	Number of backers of a crowdfunding project
AvrgContr	Average contribution per backer in €
FB	Availability of a dedicated Facebook page for the project (1=yes, 0=no)
TW	Availability of a dedicated Twitter profile for the project (1=yes, 0=no)
Founders	Number of founders of the crowdfunding project as stated on the crowdfunding page

All factors are considered instruments the project founders can determine or influence during a crowdfunding campaign. The effect of different funding goal levels was tested for the

probability of success, the degree of success and the backers per project as well as the average contribution per backer. We employ regression analyses, including robust logit- and linear OLS-regression and separate four levels of funding goals. Table 1 illustrates the variables used in this study.

The project categories were included as a control, as explained in Table 1. All conducted regressions were robust, thereby for *Success* we used a robust logit-regression and for *Degree of Success*, *Backers* and *Average contribution per backer* we used robust linear regressions. The assessed projects were assigned to four categories determined by three different funding goal thresholds: The 25%-percentile of the funding goal in our dataset at 4000€, the 50%-percentile at around 7000€, and the 75%-percentile at 15,000€. To compare our results for the different goal levels to the overall dataset, a regression without separating projects with respect to goal levels was executed.

3. Results and Analysis

From the 338 examined projects 51.78% were successful with an average funding goal of 13,364.53€ and an average of 7,999.16€ raised per project. Each project posted around 5 updates, had around 11 comments on their crowdfunding page, offered an average of 11 different rewards to the crowd and was supported by 102 backers. 82.54% of all projects integrated at least one social media platform on their crowdfunding page, 85.80% provided at least one picture and 97.34% provided at least one video. Table 2 provides the summary statistics for the investigated projects and Table 3 provides the pair-wise correlations.

Since only 8 projects neither had a video nor any pictures and both variables proved insignificant with p-values ranging from 0.1 to 0.9, we excluded videos and pictures from the subsequent analyses. The availability of videos and pictures rather seems to have established as basic standard for a vast majority of projects and for our case cannot be used to explain crowdfunding success. The regression results are summarized in Tables 4 to 6, whereby the first project category (*Cat1*) is omitted and serves as the comparison group for the other project categories. The regressions conducted for the *average contribution per backer* suffered from low R-squared values ranging from 0.0308 to 0.1538 and F-tests showed a low regression model fit. Thus, the results indicate that the average contribution per backer cannot be explained by the examined factors and is not further considered in this study and H3 is rejected.

Table 2: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Success	338	0.517752	0.500426	0	1
DegrSucc	338	0.762214	0.894979	0	9.68
Goal	338	13,364.53	23,652.52	100	280,000
Cat1	338	0.295858	0.457104	0	1
Cat2	338	0.405325	0.491683	0	1
Cat3	338	0.298817	0.458418	0	1
PIC	338	0.857988	0.34958	0	1
VID	338	0.973373	0.16123	0	1
NrUpd	338	4.976331	5.353335	0	36
NrCmt	338	10.53846	15.799	0	109
Keywords	338	4.630178	0.909515	0	5
NrReward	338	11.38462	7.690219	0	101
PrjDetail	338	555.6479	280.6267	79	1,426
AvrgContr	338	89.14154	141.0363	0	1,918.25
Raised	338	7,999.163	20,320.32	0	321,226
DegrSucc	338	0.762214	0.894979	0	9.68
Backers	338	101.9112	189.7285	0	1,902
FB	338	0.772189	0.420042	0	1
TW	338	0.284024	0.451617	0	1
Founders	338	2.467456	2.382018	1	21

Table 3: Correlation Matrix

	Success	DegrSucc	Goal	Cat1	Cat2	Cat3	PIC	VID	NrUpd	NrCmt	NrRewards	PrjDetail	Backers	FB	TW	Founders
Success	1															
DegrSucc	0.6819*	1														
Goal	-0.0963	-0.1036	1													
Cat1	-0.023	-0.0541	0.1078	1												
Cat2	-0.0595	-0.0509	-0.0522	-0.5351*	1											
Cat3	0.0868	0.1086	-0.0516	-0.4232*	-0.5390*	1										
PIC	0.1841*	0.1565*	0.0094	0.0594	-0.0957	0.0434	1									
VID	0.1346	0.1019	0.0082	-0.0538	-0.0132	0.0678	0.3539*	1								
NrUpd	0.4864*	0.3508*	0.2219*	0.0502	-0.0786	0.0343	0.1980*	0.0852	1							
NrCmt	0.3917*	0.3555*	0.1285	0.0806	-0.0904	0.0166	0.0982	0.079	0.4635*	1						
NrRewards	0.2365*	0.1688*	0.1255	-0.1329	0.114	0.0102	0.1484*	0.025	0.3065*	0.2591*	1					
PrjDetail	0.2027*	0.1611*	0.1529*	0.0546	-0.1085	0.0619	0.1229	-0.0401	0.3193*	0.1951*	0.1532*	1				
Backers	0.4263*	0.4294*	0.3944*	-0.1464*	0.1151	0.0226	0.1377	0.0722	0.5026*	0.5753*	0.3076*	0.2219*	1			
FB	0.2663*	0.2143*	0.0464	-0.0652	-0.0257	0.0926	0.2236*	0.1292	0.1982*	0.099	0.1457*	0.1972*	0.1694*	1		
TW	0.2665*	0.2620*	0.0745	-0.0345	-0.0122	0.0475	0.0119	-0.0588	0.2974*	0.2351*	0.0872	0.1789*	0.2291*	0.2170*	1	
Founders	0.2868*	0.2422*	0.0386	-0.0756	0.0151	0.0592	0.1726*	0.0557	0.1910*	0.1623*	0.1431*	0.2906*	0.2654*	0.1423*	0.1576*	1

Note: * indicates a p-value < 0.01

Table 4 illustrates regression results for the distinction of successful and unsuccessful projects. Considering the project categories, artistical and social projects appear to be more successful than product-related projects for the highest level of funding goals above 15,000€, and artistical projects less likely to be successful for projects below 4,000€. Both factors the number of updates and comments are highly significant for the overall model, indicating a positive impact on project success. Considering the regression models separated by different funding goals, the number of updates display an unclear pattern with high significance for projects below 4,000€, no significant impact on success for projects between 4,000€ and 7,000€ and significance for projects above 7,000€. The significance levels of number of comments increase with a higher funding goal and are not significant on the lowest level for projects below 4,000€. Both variables indicate that keeping the crowd informed about the project by updates and interacting with the crowd through the comment section on a crowdfunding platform is central to project success, but results vary for different funding goals. The number of offered rewards is not significant for the overall model, but highly significant for the projects below 4,000€. Offering a variety of rewards thus might influence project success for projects with a low funding goal but becomes less relevant with an increasing funding goal.

Both social media and the number of founders indicate the access to a larger network around the crowdfunding projects. A dedicated Facebook project page is significant for the overall model, but not significant for any of the models for the different funding goal ranges. The number of founders is highly significant in the overall model and for projects between 4,000€ and 15,000€, but not significant for projects below or above this range. A higher number of founders can be understood as access to a larger personal network, offering to promote the project to a larger audience. Thus, projects with a low funding goal may not depend on a very large network or might not require a broad Social Media promotion. In contrast, the number of founders is relevant with an increase of the funding goal, such that a broader network may contribute to a project's success. For projects with relatively high funding goals, the pure number of founders may not be sufficient anymore to explain the network effect on project success, but other factors such as innovativeness, attractiveness of rewards or more subjective factors may have a larger impact.

Table 4: Robust Logit Regression Results for Project Success

Dep. Variable Project Success	All Data (1)	< 4000 € (2)	4000 € - 7000€ (3)	7000 € - 15000€ (4)	> 15000 € (5)
Cat2	0.142	-2.105**	-0.319	1.144	1.998**
	(0.42)	(-0.42)	(-0.36)	(1.53)	(2.20)
Cat3	0.449	0.768	0.149	1.607**	1.626*
	(1.18)	(0.42)	(0.15)	(1.96)	(1.87)
NrUpd	0.207***	0.623***	0.162	0.209**	0.191***
	(4.11)	(3.49)	(1.20)	(2.14)	(3.46)
NrCmt	0.0615***	0.135	0.123**	0.128**	0.0809***
	(3.39)	(1.35)	(2.09)	(2.41)	(2.88)
NrRewards	0.0133	0.260***	0.181*	0.0236	-0.0292
	(0.71)	(2.74)	(1.67)	(0.89)	(-0.76)
PrjDetail	-0.0409	0.134	0.00627	0.141	-0.0868
	(-0.74)	(-0.65)	(0.03)	(1.24)	(-0.69)
FB	1.017***	0.496	1.134	1.356	0.633
	(2.75)	(0.51)	(1.59)	(1.33)	(0.63)
TW	0.521	1.304	0.558	0.923	0.0807
	(1.55)	(1.40)	(0.73)	(1.20)	(0.09)
Founders	0.216***	0.207	0.428**	0.270**	0.241
	(3.35)	(1.40)	(2.32)	(2.28)	(1.40)
_cons	-2.876***	-3.472***	-5.098***	-6.332***	-4.048***
	(-5.96)	(-2.60)	(-4.64)	(-3.98)	(-3.04)
N	338	82	73	92	91
R-sq	0.327	0.533	0.439	0.456	0.484

t statistics in parentheses: * $p<0.10$, ** $p<0.05$, *** $p<0.01$

The results for regression analysis on the degree of success are illustrated in Table 5. While the project categories for the previous logit-regression revealed several significant differences for projects, the results for the linear regression on degree of success reveal significant differences only for projects between 7,000€ and 15,000€. For the number of comments and updates a comparable pattern as shown in Table 4 could be observed: A tendency of more significant results for projects with an increasing funding goal can be observed. While both factors are significant for the overall model, neither the number of updates nor the number of comments for projects in the lowest funding goal range are significant. However, as the funding goal increases, both factors become significant at the 1%-level, indicating a moderation effect of the funding goal.

Concerning the social media factors, the availability of both a Facebook project page and a dedicated Twitter profile are significant for the overall model but turn insignificant for the remaining models with the exception of a slight significance at the 10%-level of a Facebook

page for projects below 7,000€. The pattern for the number of founders is the comparable to the results from Table 4, with the exception that this factor remains significant for projects above 15,000€. Since a logit regression only separates between successful and unsuccessful projects, the information on the individual degree of success is lost, thus the underlying distributions of the included variables differ between the two regression approaches and differences in significance levels could be due to these distribution differences. A common result, however, is that some clear patterns are observable for both regression approaches, indicating a strong support for the claim of this study that different funding goals determine the impact of the investigated factors on success probability and thus H1 is supported.

Table 5: Robust Linear Regression Results for Degree of Success

Dep. Variable **Degree of Success**	**All Data** (1)	**< 4000 €** (2)	**4000 € - 7000€** (3)	**7000 € - 15000€** (4)	**> 15000 €** (5)
Cat2	0.0555	-0.284	-0.0605	0.346**	0.183
	(0.75)	(1.42)	(-0.36)	(2.59)	(1.62)
Cat3	0.182	0.419	-0.129	0.321**	0.107
	(1.43)	(0.88)	(-0.73)	(2.57)	(0.98)
NrUpd	0.0284**	0.0528	0.00166	0.0258*	0.0242***
	(2.54)	(0.97)	(0.08)	(1.68)	(2.92)
NrCmt	0.0124***	0.028	0.0357***	0.0242***	0.0125***
	(2.96)	(0.83)	(2.94)	(3.80)	(5.15)
NrRewards	0.00155	0.041	0.0276*	0.00182	-0.000156
	(0.33)	(0.84)	(1.68)	(0.61)	(-0.03)
PrjDetail	-0.00722	-0.0361	-0.00465	0.0339*	-0.0100
	(-0.49)	(-1.05)	(-0.13)	(1.72)	(-0.51)
FB	0.233***	0.341*	0.242*	0.185	0.0885
	(3.61)	(1.96)	(1.85)	(1.43)	(0.74)
TW	0.224*	0.398	0.0997	0.0821	0.0584
	(1.69)	(1.49)	(0.63)	(0.65)	(0.44)
Founders	0.0524***	-0.00236	0.149***	0.0426**	0.0622**
	(3.34)	(-0.06)	(3.99)	(2.27)	(2.18)
_cons	0.0631	0.0298	-0.259	-0.429**	-0.049
	(0.72)	(0.05)	(-1.40)	(-2.56)	(-0.31)
N	338	82	73	92	91
R-sq	0.2314	0.2633	0.5951	0.4971	0.5949

t statistics in parentheses: * p<0.10, ** p<0.05, *** p<0.01

The regression results for the number of backers per project can be found in Table 6. Whilst the number of updates was a highly significant variable for the previous dependent variables on success, there is only one significance at the 10%-level for projects above 15,000€. However, the number of comments demonstrates a much stronger effect in this case and

throughout all regression models, except for the group with the lowest goals. This finding indicates, that for attracting backers a higher interaction with the crowd seems to be more relevant for attracting more supporters than posting more updates. However, comments are highly correlated with the number of backers (r=.58) and we rather assume a reciprocal effect of an increasing number of backers that leads to an increase in comments, rather than the fact that a high number of comments leads to the attraction of more backers in the first place. Nonetheless, for projects below 7,000€ the number of comments is not or only slightly relevant, which indicates that the interaction of backers with the founding team through comments gets more significant for projects with higher funding goal levels, partially supporting the claim of H2. Concerning social media integration, no strong effect could be found for the average number of backers per project. However, the number of founders reveals an interesting pattern: For projects above the 7,000€ funding goal threshold, the number of founders is not significant, but highly significant for projects below 7,000€, further supporting the claim of a moderating role of funding goal levels and supporting H2. This finding strengthens the idea that projects with a rather high funding goal do not significantly benefit from a larger founding team, indicating that at some point the personal network of founders becomes less relevant and other factors become more important for project success. Projects with lower funding goals may benefit more from close friends or family members supporting a project, but the higher the funding goal the more backers outside the founders' networks might have to be attracted.

The number of offered rewards and the number of words used for a project description is not significant in almost all regression models, and thus not considered a good instruments that impact success in our examined crowdfunding projects. Since we only assessed the total number of rewards, and not the nature, attractiveness or price levels of rewards, we can merely state that increasing the number of offered rewards does not increase success probability substantially nor attract more backers for the assessed projects. Following this logic, the same holds true for the length of project descriptions, which we only assessed by the number of words used. A more detailed assessment of rewards and specific components of a project description could potentially yield different results.

Comparing the two assessed social media networks Facebook and Twitter, Facebook played a slightly more significant role than Twitter. Although both social media platforms and the number of project founders are indications for the accessible network size of a project, the number of project founders proved to be much more significant in almost all regression models.

Table 6: Robust Linear Regression Results for Backers

Dep. Variable Number of Backers	All Data (1)	< 4000 € (2)	4000 € - 7000€ (3)	7000 € - 15000€ (4)	> 15000 € ()
Cat2	89.93***	1.549	19.19	127.0***	145.7***
	(4.27)	(0.13)	(0.79)	(3.36)	(2.65)
Cat3	49.41***	5.852	-17.96	81.01***	70.00*
	(3.44)	(0.32)	(-0.73)	(3.34)	(1.83)
NrUpd	9.175	2.079	-6.311	0.444	17.95*
	(1.51)	(1.30)	(-1.57)	(0.17)	(1.77)
NrCmt	5.148***	1.544	5.690*	6.065***	3.884**
	(4.86)	(1.06)	(1.83)	(3.29)	(2.10)
NrRewards	1.560	1.605	0.409	-0.248	5.185
	(1.01)	(0.87)	(0.16)	(-0.41)	(1.43)
PrjDetail	1.425	-1.782	1.193	10.91**	-3.517
	(0.42)	(-1.23)	(0.16)	(2.06)	(-0.34)
FB	17.30	14.48	37.68*	-5.280	-12.14
	(1.18)	(1.63)	(1.68)	(-0.21)	(-0.27)
TW	5.497	8.612	73.54*	9.039	25.06-
	(0.32)	(0.91)	(1.94)	(0.39)	(0.48)
Founders	9.011***	5.579***	27.38***	6.253	5.100
	(2.77)	(2.68)	(2.67)	(1.25)	(0.54)
_cons	-112.0***	-10.61	-68.07**	-124.9**	-126.8
	(-3.73)	(-0.46)	(-2.02)	(-2.57)	(-1.45)
N	338	82	73	92	91
R-sq	0.4966	0.2853	0.5263	0.3976	0.5829

t statistics in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Conclusion

The conducted regression analyses provide insights into the role of different funding goal levels for the effect of success factors on crowdfunding projects. We find clear indications that some success factors impact the success probability of a crowdfunding project differently when varying funding goal levels are taken into account. We find strong indications for the overall claim of this study, that the funding goal of crowdfunding projects should be incorporated as moderating variable in quantitative analyses aiming at investigating crowdfunding success.

However, this study is also subject to some limitations that future studies should address. First, we only assessed the availability of pictures, videos and social media and the total number of updates and comments. Previous studies indicate that also the quality or content is a decisive factor that explains why backers provide funds. For example, Hu, Li, and Shi (2015) found that the differences in rewards provided to backers for different funding levels shapes people's intention to spend money on a crowdfunding project. Likewise, also the quality and specific content of the provided videos or posted updates (see Kuppuswamy & Bayus, 2017) should be

considered. Nonetheless, this study did not seek to comprehensively explain crowdfunding success. Some of the common factors that are usually assessed in crowdfunding research were included in this study to confirm that the funding goal should not only be considered a factor that directly impacts project success, but also strongly moderates the effects of other factors on project success.

We assessed factors which can be understood as instruments influenced by project founders directly on the websites of their projects on crowdfunding platforms. Thus, our results constitute important information for nascent entrepreneurs who choose to run a crowdfunding campaign to finance their idea: the relevance of individual factors must be considered differently depending on the required funding. In particular, we found that the interaction with the crowd through posting updates and encourage an active comment section becomes more important with an increasing funding goal. Other factors like providing pictures or videos were found to be significant success factors by previous research, however, our findings indicate that pictures and videos became rather basic requirements for a crowdfunding project and cannot help to explain success. The decision of which instruments to use in order to be successful is significantly moderated by the chosen funding goal, and project founders are encouraged to carefully think about the interplay of different funding goals and the effect of the employed instruments. A strong factor we found was the number of founders, thus we encourage future project founders to start a project in a team rather than creating a project with only one representative. Future studies are required to investigate more detailed effects of different funding goal level, and to determine which factors are more relevant for projects with lower goals and which factors become increasingly important for projects targeting high funding goals. We especially emphasize the need to develop an approach to assess ‚newness' or ‚innovativeness' of projects, since many studies do not consider the nature of individual projects. A more detailed investigation of the interplay of different funding goal levels and success factors could be carried out considering the quality, innovativeness and specific type of project. Our study provides first indications in this direction and thereby contributes to the general understanding of the dynamics of the innovative financing alternative that rearranged the venture capital environment – reward-based crowdfunding.

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IS REALLY IMPORTANT TO CREATE AND PLAN THE REINVESTMENT PROCESS?

Pavla Pokorná – Petra Krejčí – Jarmila Šebestová

Abstract

Purpose: The main goal of presented study is to explain in a more comprehensive view process based on planning, calculating, managing and much more. Changes in the business environment, both external and internal, and hence the innovation process, are closely related to the reinvestment process. And the approaches of business entities to risk, changes in the environment and the reinvestment process in relationship to gender, education and age of entrepreneurs.

Design/methodology/approach: A standardized primary research was made to get relevant opinion about reinvestments and related factors about financial literacy in the Czech Republic. A sample of 238 interviews was provided as quantitative survey with business owners or managers of the Czech businesses to discuss their approach in area reinvestment and factors, which affects their decisions (September 2018 – July 2019). Key information was evaluated on Likert scale to be able to compare the results. A correlation analysis was used to find out statistically significant ties between variables.

Findings: A statistically significant tie was found between calculations and business economics knowledge. Opposite to that a negative relationship was found between business agenda and a limit of a maximum lost.

Research/practical implications: Main suggestion is to support financial literacy education and business economics education, which play significant role in successful financial management. A statistically significant tie was found between calculations and business economics knowledge.

Originality/value: An original contribution could be seen in detailed analysis of behaviour of entrepreneurs in area of reinvestments. There were described relationship between planning, calculation and economic knowledge in one research, which is not existing before.

Keywords: reinvestment, planning process, calculations, environmental impact, innovation

JEL Codes: M14, L26

Introduction

Entrepreneurship is associated with a certain kind and degree of risk and uncertainty. These aspects affect start-up management and ability of an entrepreneur to realize actions during company development, which corresponds to the managerial competence of the owner. All activities are associated with planning, calculation and analysis (High, 2009). On the other hand, a reinvestment plays a significant role for this purpose (Audretsch and Thurik, 2003). Financial planning is closely connected with many areas such as: planning, calculating and reporting to prepare entrepreneurs for a more prospective future, especially in area of financial management and resource management within appropriate business education (Pittaway and Cope, 2007; Fiet, 2001). In a line with that, a company development, when reinvestment process plays an important part of the decision-making process in financial management not only small businesses (Zhou, 2017).

The main goal of the paper is to identify a relationship between a knowledge of calculations, reinvestments and other factors, which affects a decision, why business owners are motivated to reinvest their profit.

1.   Decision-making process for business development

Businesses are diverse and each is specific, but decision-making processes must be planned, applied and analysed in everyone, whether in a large multinational enterprise or a micro enterprise. A planning helps businesses to achieve predefined goals, make decisions quickly and efficiently on the basis of elaborated documents, and achieve operational goals faster than without them. It also helps to focus on a clearly defined goal and not to deviate from, for example, business goals (Delmar and Shane, 2003). there are researches where companies grew faster and, according to a specific research by Brinckmann et al. (2010), companies that use planning at their inception grew faster than those who did not. An entrepreneur always carries a degree of uncertainty and risk, which is related to the fact that he coordinates the plans, introduces new goods and production processes supported by reinvestment.

Reinvestments are, as the name suggests, profit already generated from a successful investment, and this financial amount will be reused for business development as investment money. Lazonick and Mazzucato (2013) had been involved in the decision-making process of redistributing the resources of large US companies for several years and mentioned a trend where companies have tended to withhold profit and are just doing the reinvestment process, especially in the areas of increasing human resources skills to increase competitiveness. Changes, planning and calculations are also closely related to innovation, so that the company

can continue successfully. According to Edwards-Schachter (2018), it can be divided into technological, service, product, business, design-based, process, social or responsible. Each of these innovation groups can have many definitions. (Manzini, 2014; Gault, 2018; Lee et. al., 2012; Edwards-Schacher and Wallace, 2017).

The research gap was found that in earlier studies was found that terms such as planning, calculations, innovations, changes or reinvestments are closely connected but there are not studies, which are connecting all those variables together. It is the reason of presented results.

2.   Data Collection and Key Findings

A quantitative study was used to obtain relevant data from primary research conducted in 2019 in the Czech Republic. The dataset was stratified by regional number of entrepreneurs in amount of one permille (1 ‰) from business population in the Czech Republic in 2018, companies were randomly selected from AMADEUS database. All data collection was based on a personal visit and subsequent check to see if all questions were answered. The interviews were conducted face-to-face or by telephone, when 66% of semi-structured interviews were conducted face-to-face and 34% of semi-structured interviews were conducted by telephone. A total of 1,206 entrepreneurs were addressed and 238 entrepreneurs attended the interviews. Overall, the interviews lasted approximately 175 hours and 30 minutes. 78.5% of answers to questions about numbers (qualitative evaluation, descriptive variables) were obtained directly from entrepreneurs and 21.5 % of responses were taken directly from the enterprise records. A choice of presented variables is summarized below (table 1).

Tab. 1: Descriptive statistics about data sample

Variable	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Interviews in minutes	238	110	10	120	40.21	19.152	366.791
Gender	238	1	1	2	1.32	0.466	0.217
Age	238	4	1	5	3.16	0.763	0.582
Education	238	4	1	5	2.42	1.187	1.409
Experience	238	3	1	4	1.93	0.963	0.927
I have a limit for a maximum lost	238	4	1	5	2.83	1.321	1.744
Planning investments	238	4	1	5	1.98	1.083	1.173
Basic knowledge about business economics	238	4	1	5	1.76	0.842	0.708

Variable	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
I prefer to use own capital	238	4	1	5	2.59	1.426	2.032
Cash-flow	238	4	1	5	1.89	0.845	0.714
Profitability	238	4	1	5	1.69	0.808	0.652
Process Management	238	4	1	5	2.14	1.064	1.133
Business Agenda	238	4	1	5	1.80	0.913	0.834
Willingness to reinvest	238	1	0	1	0.85	0.355	0.126
Calculations	238	4	1	5	1.54	0.772	0.596
Financial goals	238	4	1	5	1.94	0.955	0.912
Observing financial reports	238	3	1	4	1.33	0.626	0.391

Source: Author's calculations.

A sample of research consists of 68.57% of entrepreneurs - men and 31.43% of entrepreneurs - women. Their average age was the same for both gender respondents, namely the age group in the range of 41-55 years (of which men are 52.38% and women are 59.74%, in total it is 54.69% of respondents). Among the male entrepreneurs surveyed, the most frequently occurring education was the General Certificate of Secondary Education, with 40.48% of respondents in this group. In the case of women, there was a consensus in the two most common categories dealing with education, namely secondary education with GCE (38.96%) and higher education (38.96%), where the number of female entrepreneurs was the same (Table 2).

Tab. 2: Typical Respondent Information

Variable	Male	Female
Age	41-55 years (52.38%)	41-55 years (59.74 %)
Business experience	20 + years (46.42 %)	20 + years (36.36%)
Education	High school with graduation (40.48%)	University degree (38.96%) High school with graduation (38.96%)
Reinvestment activity	Yes (88.1%)	Yes (79.22%)

Source: Author's calculations.

Overall, it is interesting that most of the entrepreneurs surveyed are engaged in reinvestment activities in their company. If we were to compare both samples with higher reinvestment activities, men showed 88.1% while women lagged with 79.22%. In other words, most sub-investors invest in change and de-modernization regardless of gender. The table below (Table 3) shows how the entrepreneurs in question do cost calculations in their company.

Tab. 3: Table of business people, dedicated to calculations

Answer	Men (number)	Men (in percent)	Female (number)	Female (in percent)	Total	Total (in percent)
Strongly Agree	101	61.96	35	46.66	136	57.14
Agree	55	33.74	34	45.33	89	37.39
Neutral	1	0.61	1	1.33	2	0.84
Disagree	5	3.06	4	5.33	9	3.78
Strongly disagree	1	0.61	1	1.33	2	0.84
Σ	163	99.98	75	99.98	238	99.99

Source: Author's calculations.

All in all, interviewing entrepreneurs is involved in creating cost calculations. Those who do the calculations definitely answered yes (answer 1) is the largest proportion in both sexes, but in men is highly positive response in more than 61% of business men but only 46.66% of women doing business is creating calculations highly important and devote adequate time to it. If we added up the answer, that answer 1 and 2 in the table below we have made the surprising result, the total number of those who make at least some costing for men is 95.70% of the total surveyed entrepreneurs. For women, this figure is also large, specifically 91.99% of those who calculate. Those who are definitely not doing so are a total of 2 entrepreneurs out of a total of 238 entrepreneurs.

The table below shows entrepreneurs' answers regarding calculations, whether entrepreneurs monitor financial indicators especially profit in their company. Tracking these variables is taught at every school, but whether they do it is stated according to the research results.

Tab. 4: Table concerning calculations, profit monitoring and other variables

	Men (number)	Men (in percent)	Female (number)	Female (in percent)	Total	Total (in percent)
Strongly Agree	118	72.39	56	74.66	174	73.10
Agree	37	22.69	17	22.66	54	22.68
Neutral	5	3.06	0	0	5	2.10
Disagree	3	1.84	2	2.66	5	2.10
Strongly disagree	0	0	0	0	0	0
Σ	163	99.98	75	99.98	238	99.98

Source: Author's calculations.

According to the results, 73.10% of entrepreneurs are actively involved in calculations. This average result exceeds the answers of the female part of the self-employed, so this result is slightly higher and has a value of 74.66%, compared to the men who have 72.39%. In the

second possible (slightly) concordant response, the values differ only minimally, the result is 22.69% for men and 22.66% for women. This result is very positive, and it is because many of these entrepreneurs are already more experienced. It is also interesting to note that none of the interviewees responded completely negatively and it is therefore clear that entrepreneurs monitor the financial results of the company. Those who answered most negatively (number 4 - a slight disagreement with the fact that the entrepreneur watches and monitors profit and other variables) are respondents who are in the range of 26 - 40 years and two and the remaining three respondents fall into the age category 41 - 55 years, four of them are even entrepreneurs who do business in 10-20 years.

Tab. 5: Table of planned investments

	Men (number)	Men (in percent)	Female (number)	Female (in percent)	Total	Total (in percent)
Strongly Agree	68	41.71	27	36	95	39.91
Agree	63	38.65	30	40	93	39.07
Neutral	11	6.74	3	4	14	5.88
Disagree	18	11.04	13	17.33	31	13.62
Strongly disagree	3	1.84	2	2.66	5	2.1
Σ	163	99.98	75	99.99	238	99.98

Source: Author's calculations.

In deciding what to do with the profit that entrepreneurs seem to have guarded and calculated according to previous research is the possibility to use investment decisions, or reinvestment decisions when reinvesting profit. Most of the addressed entrepreneurs consider investment in innovation very strongly, namely the sum of answers 1 and 2, i.e. 78.98% of the interviewed entrepreneurs. Those who replied strongly disagree are four-fifths college students. The group of those who disagree slightly is mostly secondary school (20 out of 31), the remaining 11 have a university degree.

To support previous descriptive results a correlation analysis was used (p value <0.05). We had compared two types of variables: (a) real behaviour represented by selected activities like calculations, financial goals and (b) real behaviour described by planning knowledge of ratios and others. (table 6)

Tab. 6: Relationship between behaviour and expectations based on correlation analysis

Behaviour (I am doing) / Expectations (I feel that I know)	Calculations	Financial goals	Observing financial reports	I have a limit for a maximum lost
Planning investments	0.258	0.305	0.208	0.219
Basic knowledge about business economics	0.235	0.096	0.059	0.033
I prefer to use own capital	-0.028	-0.025	-0.080	-0.039
Cash-flow	0.123	0.237	0.181	0.267
Profitability	0.117	0.166	0.161	0.185
Process Management	0.140	0.100	0.216	0.098
Business Agenda	0.044	0.005	0.159	-0.021

Source: Author's calculations, p value <0.05.

Conclusion

As educators we were interested on an influence between education on a financial decision (represented by business economics in practical use). There was found a tie with planning investments (0.258) and calculations (0.235). Unfortunately, education isn't supporting an expectation how to deal with Business Agenda (Brinckmann, Grichnik, & Kapsa, 2010). There is a lowest score was found in connection with financial goals setting (when those goals are a part of business agenda). On other hand we found that differences between meaning of "profit", so it seems that entrepreneurs have some kind of financial knowledge, because they are able to diversify differences between those two ratios.

As very negative tie was described financial planning in case of using own capital, when all ties with "expectations" were slightly negative. Surprisingly, a statistical relationship between Business Agenda and planning for maximum lost is also negative (-0.021), when the lost or projection of profits and losses is a part of business plan.

A limitation of this study could be seen in sample size, business owners also do not have a deeper ability to focus on a particular type of business behaviour or expectations in the future. The research results are also influenced by the small research sample that does not have a complete information value given the number of small and medium-sized enterprises in the market. Only 238 respondents were discussed for research purposes. However, this research only precedes further research in this area. In the area of manager age, research was limited by large differences in the number of respondents in each predetermined age group. Another

limitation was getting secondary sources in the area of managerial and financial literacy, managerial age structure, and managerial education structure in the Czech Republic to support study of Pittaway & Cope (2007).

Acknowledgement

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CONTEMPORARY ISSUES OF RURAL FAMILY ENTREPRENEURSHIP: CASE OF RUSSIAN INDIGENOUS FAMILY BUSINESSES

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Abstract

Purpose: The study focuses on the research of rural family businesses of indigenous people in Russia. The social problems that these people face are related to ensuring the stability of the rural family business, which also impacts the stability of rural development. We attempt to identify the main pain points in the development of the rural family business, which require deeper understanding and examination.

Design/methodology/approach: We employed quantitative methodology and use an applied survey data analysis as the pilot study that was conducted in April 2019. The participants include 30 indigenous people in family businesses based in the Ural region of Russia.

Findings: We found that family business presents the social foundation that bridges the gap between social and economic institutes. We also identified common and most important economic and social factors that shape rural family business including, economic stability of families and transfer of family values to the next generations.

Research/practical implications: Our study contributes to the understanding of main factors influencing rural family business. We argue that family binds create unique managerial approach in family firms and close attention must be paid to the research of this specific approach.

Originality/value: We challenge the existing research on the factors that influence rural family business generation and development, and identify contextual factors that influence rural family business in Russia. We distinguish between rural family businesses from any other entrepreneurial firms, which is the cornerstone for more exhaustive research of rural family business.

Keywords: family business, rural entrepreneurship, parental labor, indigenous people, agriculture

JEL Codes: Q12, L26

Introduction

Family firms present a significant economic force worldwide. In former communist states, where family business was prohibited, family business was developing with higher rates than corporate business. Jervell (2011) argue that family business is a better organization of small business than corporate business, especially in rural communities. Despite family business potential advantages, such as higher loyalty and greater faith in long term stability, Backman and Palmberg (2015) warned that family businesses cannot serve as locomotives for local economy. This position of the 'second plan players' and family 'bread-winners' leads to risk avoidance and loosing profitability in family firms.

Russia presents a unique contextual setting to examine family business (Barkhatova et al. 2001). This creates an exciting opportunity to investigate history and development of rural family business. This in turn, can help to examine fundamental principles of rural family business applicable to different countries with different context (Polbitsyn and Earl, 2019).

1.   Rural family business

In order to present a comprehensive yet disciplined review of the research on family business, we have conducted a literature review focusing the scope of the analysis on family business and family entrepreneurship. Family business is not a new phenomenon and it is often categorized by the combination of the three dimensions: family, management, and ownership (Leskova and Shalashnikova, 2016). Furthermore, family involvement, the competitive advantage that is derived from the interaction of the three dimensions mentioned above and the owner's obsession with creating a family legacy also characterize family business (Gupta et al. 2008).

Seaman (2015) argues that one family may have more than one business and conclude that family is more important than business. The author suggests exploring business families rather than family business and argues that family relations are more important for family business succession. These relations must create social net, where business will be developed. One of the main reasons to start up a family business is to create social networking (Seaman, 2015; Seaman et al. 2017). It is futile not to agree with authors that family business paves the best way to create sustainable relations not only inside one family, but between families that cooperate in business, thus establishing socioemotional wealth (Gomez-Mejia et al. 2011). Customer-business relations is a critical element of social networking as well as of family business. These relations are built on loyalty and attachment of customers to the family. Consumers generally feel that when buying from family business, they become the part of the family and develop closer relations with the business (Carrigan and Buckley, 2008). The

creation of social network with customers is an advantage of family business, because of the meaning of 'familiness' in consumers' minds when linked to family business. This is particularly important in rural communities because 'familiness' for these communities means support and sustainable development.

This argument serves mostly for the social origin of family business. The social identity theory (Wielsma and Brunninge, 2019) gives us the opportunity to describe family business as an institution for developing social relation within family. The social value of family business is fundamental in rural territories (Bosworth, 2012). Sustainable social and economic development of rural territories is based primarily on local family businesses because of their social responsibility for the rural community.

On other hand, any family business organization must be treated and evaluated as a commercial entity, because the primary goal of any entrepreneurial organization is to generate profit (de Lima et al. 2015). To explore family business strategies authors view family business as entrepreneurship organizations with specific management and attempt to develop strategies for family business based on this peculiarity.

One of significant peculiarities of family business is the easier transition process from one generation to another (Jervell, 2011). The author claims that family business has better sustainability than any entrepreneurship organization, giving the opportunity to foresee its development for a longer period of time. Although the easier transition process can be seen as an advantage for family businesses, for this transition process to run smoothly there is a need for sophisticated management practices.

Another oddity of family business is the attitude to innovation and new technologies. The research on digital behavior of rural entrepreneurs illustrates that family entrepreneurs are less ready to enroot new technologies (Philip and Williams, 2019). Family business owners argue that they need to protect family traditions, rather than follow the market. The challenge that family business faces is to balance being profitable and not compromise family traditions. Bozhkov (2019) interprets family business in Russia as any entrepreneurial business, aimed to gain profit. However, in rural territories any business must bear social responsibilities. This in turn creates a challenge of balancing act for family business.

We state that human capital is challenging to imitate because it is tacit and as a result it becomes a valuable business resource. Human capital incorporates the experience, skills and knowledge of management, as well as networks of personal and professional ties. Human capital enhances competitive advantage of firms, hence human capital resource is vital in business succession (Ployhart and Moliterno, 2011).

We argue that in rural family business in Russia, human capital presents a fundamental recourse that helps to develop entrepreneurial intent (Kalendgan and Volkov, 2011). For the purpose of our study, we view human capital through the lens of parenthood, the concept that has been overlooked in the literature. Yet, parenthood is crucial in developing success factors for rural family business.

Parental labor differs in different types of families, especially in family businesses. We argue that there are specific characteristics of parental work in families engaged in family business in agriculture. Shipitsyna (2015) finds that higher levels of exposure to a prior family business, attitudes towards ownership, family support and entrepreneurial self-efficacy significantly influence a family business intent to be entrepreneurial. We add to the existing literature and argue that earlier training of children in labor skills, which may be due to the territorial proximity of the place of residence of the family and place of employment, play a significant role in rural family business success, especially in Russia. Parents, realizing professional entrepreneurial work directly observed by the children, can have more influence on the formation of character traits such as hard work, responsibility for the results of work, adherence to family values and traditions, to which family business is primarily related (Polyakov and Vinokurova, 2011).

We further argue that earlier development of the professional aspects of the human capital of children associated with the acquisition of entrepreneurial competencies, including the development of an entrepreneurial culture, entrepreneurial way of thinking and opportunistic nature (Leskova and Shalashnikova, 2016). Traditionally, the development of professional elements of human capital begins in the process of obtaining a vocational education. If the family is engaged in family business, then, the transfer of certain professional competencies is organically included in the process of early family education and development (Matusenko, 2014).

The juridical definition of family business in Russian jurisdiction is absent (Levushkin, 2018). According to the Russian Civil Code there are household businesses and individual farms, both terms cannot give clear understanding of what family business actually is. According to the Russian Law on farms, only family members are entitled to be employed. To assume that family businesses may be included in any of two groups, we must identify them as households or farms. To continue our statistical research, we accept all household businesses and farms as family businesses for the sake of clarity.

The structure of agricultural production in Russian Federation over time is presented in Figure 1. It demonstrates the importance of rural family business in Russian agriculture.

Fig. 1: The structure of agricultural production in Russian Federation (in %%)
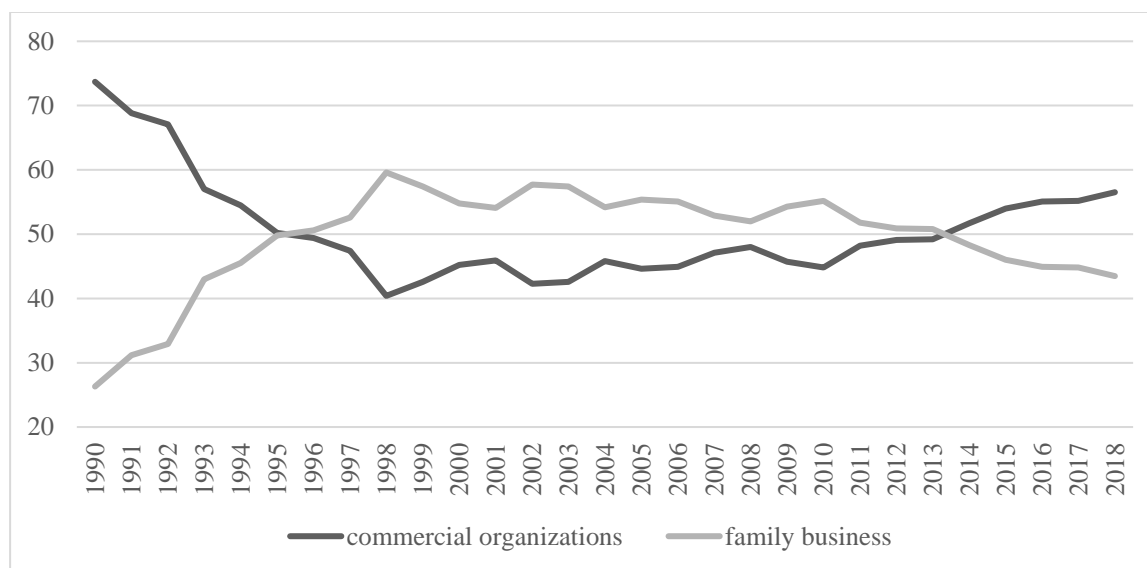
Source: Russian Federal State Statistics Service (2020).

Three periods of the family business development are presented in the diagram. The first period, 1990-2000 is the time when entrepreneurship was allowed in Russia. During this time almost all rural households attempted to become business units. As illustrated in Figure 1, the growth of agricultural production is phenomenal. When former collective farms were unable to organize new type of business, oriented on consumer's market, family businesses flourished and rapidly increased agricultural production because they understood customers' demand. The second period, referred to as 'parity period' of 2001-2013, when family farms production and commercial organizations production were equal. The third period, 2014-2015, when sanctions on agricultural imported goods were announced and national agricultural production increased vigorously. However, family farms were not ready to meet the growing demand and they started to lose to commercial organizations.

Rural family business has become the second important player on the Russian agricultural market. However, family businesses have no necessary resources for rapid growth under fast changing conditions. Lack of experience and resources is a clear challenge in developing human capital in Russian rural family businesses. Furthermore, family business in Russia experiences higher level of unpredictability and lower level of stability. Family businesses in Russia are not adequately organized into associations and unions to protect their interests on local and national levels. We also consider family business as a social institution in which parenting and parental labor have the specific features (Bagirova and Shubat, 2018).

2.   Research method and data

The methodology of our research is based on the identification of the conceptual development of family business as the part of rural economic systems. The purpose of this pilot study is to identify the most dominant factors effecting intention towards family business in Russia. The focus of the study is Russia, the country with wiped history of family business that was developed in the country for centuries. The preliminary research was conducted during the special session dedicated to social and economic development of Bashkir communities as the part of the scientific conference in the Ural Federal University, Russia in April 2019. The Bashkirs are one of small indigenous Turkic people of Ural region in Russia with population of approximately 40,000 people in Sverdlovsk oblast. They stand on the strong position of preserving their national culture (Bashkirs, n.d.).

Although there is a growing interest among researchers in rural entrepreneurship, the problem of family business, especially in territories, inhabited by indigenous people, is still unexplored. We attempt to find the factors to prove the hypothesis that family business is seen by rural indigenous entrepreneurs, mostly as the social institute, to develop family and national values. Family business is constrained by several factors that can not only reduce the entrepreneurial activities, but also negatively affect the rural social and economic development of territories inhabited by indigenous people as a whole. Our research presents a framework for the influence of the rural area indigenes on family business development and is based on socioeconomic and structural forces engaged in family business organizations.

Typologically factors were divided into two groups: external and inner factors. For our research, the following factors were chosen by experts:

1. Support of family business from local administration;
2. Necessity of marketing information on family business production;
3. Necessity for dissemination of information on specific features of rural areas development;
4. Necessity for the special supporting programs on family businesses;
5. Difficulties in interaction of family businesses.

The questionnaire for the survey was designed as a combination of Likert Scale (5 – Very Important; 4 – Important; 3 – Moderately Important; 2 – Slightly Important; 1 – Unimportant). This pilot survey serves as an illustration to demonstrate our desire to start the research process.

3.   Results: Rural family business in Russia - case of indigenous people

The questionnaires were distributed during special session in April 2019 as a part of the research conducted by the Ural federal university dedicated to the development of indigenous people of the Ural region. A sample of 30 respondents was generated. Individual ratings were treated as continuous data (Harpe, 2015). The observed data was analyzed by applying classical tests of hypotheses. We expected that means of all factors, that were chosen as significant will be not less than 4 ("important"). One-sample mean comparison test for the 2019 data gave the following results (Table 1).

Table 1. One-sample mean comparison test results

Factors	N	Mean	Standard Deviation	[95% Conf. Interval]		T value	P value
Support of family business from local administration	30	3.5	.59	3.28	3.71	-2.72	0.01
Necessity of marketing information on family business production	30	3.6	.52	3.42	3.78	-2.28	0.03
Necessity for dissemination	30	3.2	.64	2.97	3.43	-5.77	0.00
Necessity for the special supporting programs	30	2.8	.61	2.58	3.02	-8.27	0.00
Difficulties in international interaction of family business	30	2.5	.57	2.30	2.70	-11.79	0.00

The results are unexpected: all factors, that were proposed by experts to be important were not named as importnant by respondents.

The survey results are presented graphically on Figure 2. The factor "Difficulties in interaction of family businesses" is the most interesting. It was supposed to be one of the main hurdles, but respondents graded it as unimportant or slightly important, responding that there is no competition between Bashkir families and no difficulties in interaction.

The factor "Necessity of marketing information on family business production" showed its importance to family businesses. However, the problem was identified as the lack of accessible qualified marketing specialists. Cooperation with research organizations having experience in information management was suggested as an alternative solution, but most respondents rejected this possibility, appealing to the need to preserve the confidentiality of information.

When respondents were questioned on "special supporting programs" in their indigenous rural areas, they demonstrated a lack of understanding of the need to teach them not only national customs and traditions but also basic entrepreneurial skills.

The answers on information dissemination factor were supplemented with verbal comments from respondents about the dissatisfaction with the capacity of accessible information channels.

Fig. 2: Likert scale of factors restraining the family business of Bashkir rural areas in Russia
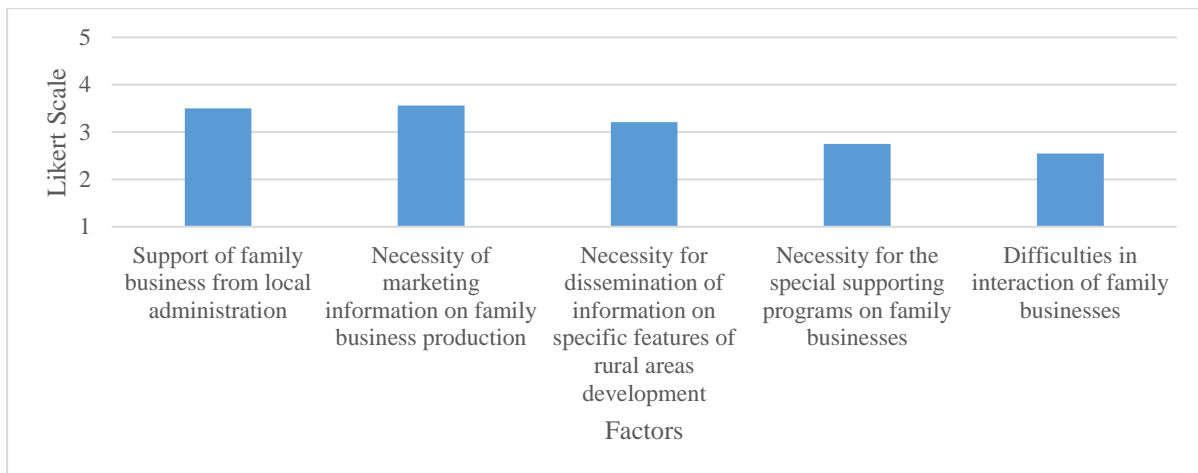
28 out of 30 respondents pointed out the lack of support from local and regional administrations, but respondents were requesting this support mainly in the form of subsidies. All respondents had no information and were not seeking information on federal and regional programs for national rural areas and entrepreneurship support. The described factors serve as the evidence of our hypothesis for the case of Bashkir people. We do not argue that our results are comprehensive and overwhelming, but as we said already, it is the first attempt to investigate the rural family business in Russia.

Conclusion

The research indicated that indigenous family entrepreneurs in Russia view family business not only as economic activity but also as the way to preserve their national identity, and therefore their attitude to family business is based on the perception of entrepreneurship as one of conventional forms to strengthen their national exclusiveness.

The indigenous family business is based on a rigid division of the internal and external environment of the entrepreneurship. Indigenous entrepreneurs believe that family business, based solely on internal resources such as primarily intellectual, can occur within any family

enterprise. The results of this study indicate that family business and rural indigenous entrepreneurs have the same principles as any other type of social activities.

The pilot survey demonstrated that factors, named by experts to be the most influential are not so important to family business owners. The results of the pilot survey and further analysis lead us by three paths for future research, that are particularly important: qualitative research of Bashkirs' family businesses to clearly understand factors influencing their development, entrepreneurial adaptiveness and performance of family businesses, and how family businesses interact with the national identity. To further continue with our research of Bashkirs' family business we first need to identify clearly significant factors influencing the development of family business. On step one, we will improve database quality by preparing a tailor-made questionnaire that will help us better differentiate factors influencing family businesses. This will allow to move to the development of rural entrepreneurship model on the next step of our research.

To result the conducted research, it is necessary to acknowledge that hurdles are appearing on all steps of entrepreneurial activities of rural indigenous family businesses. The main role in developing rural indigenous family businesses is to surmount obstacles and overcome difficulties must be played by regional and local authorities by establishing new institutes for the development of rural entrepreneurs.

Acknowledgement

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THE DEVELOPMENT OF SOCIAL ENTERPRISES IN THE CONTEXT OF DIGITALIZATION OF THE INSTITUTIONAL ENVIRONMENT

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Abstract

Purpose: The development of entrepreneurship depends on many factors, such as the institutional environment, which includes the protection of property rights, strong support for structural changes, an effective education system, and also social security. However, technological changes are one of the important components of the economic development of society. Information processing systems and digital-related activities invade almost every single aspect of the business. The study's purpose is to model the impact of the institutional environment digitalization on social entrepreneurship development in European countries.

Design/methodology/approach: For the goal achievement, a regression analysis was carried out, factors affecting social entrepreneurship were identified, and a one-factor nonlinear model demonstrating revealed patterns was constructed. The information base of the study was the international reports of the Global Entrepreneurship Monitoring and the European Index of Digital Entrepreneurship Systems. We used regression analysis to examine the relationship between social entrepreneurship and institutional environment digitalization.

Findings: A nonlinear one-factor model demonstrating the impact of physical infrastructure digitalization on social entrepreneurship at the operational phase of development was constructed. The results obtained have shown that the digitalization of institutions affects the moment when social entrepreneurship enters the operational stage that expressed in such indicators as the quality of Internet connection, its coverage, and Internet access.

Research/practical implications: The results obtained may be used in programs of social entrepreneurship development, increasing efficiency at the state level in terms of developing mechanisms to support this type of activity.

Originality/value: The originality of this study is the identification of the impact of digitalization on the operational phase of social enterprise development.

Keywords: social entrepreneurship, digitalization, institutional environment

JEL Codes: O35, L31

Introduction

Globally, social entrepreneurship has received increasing attention in recent decades. This process can be explained by complementary economic, social, and political changes due to the need to increase the efficiency of resources at various levels of management. On the one side, the number of social problems requiring innovative approaches to solving (i.e., from the demand side) is growing, and, on the other, alternative ways of solving them (i.e., from the supply side) are developing from civil society. Thus, the indicated trends stimulate interest in the development of social entrepreneurship and the implementation of relevant projects. An equally important aspect of this type of activity is the formation of hybrid value (that is, for business and the social sphere), combining aspects of non-profit and commercial activity. For example, Battilana et al. (2012) found that social entrepreneurs are the most appropriate form for sustainable management of the integration of social and commercial activities. Also, Zahra and Wrigh (2012) suggest that social entrepreneurs are more able to articulate social needs and create mixed values, supported by several types of stakeholders, to provide new products and services aimed at achieving commercial and social goals.

The development of social entrepreneurship depends on many factors, such as the formal and informal institutional environment, which includes the protection of property rights, an effective education system, and social capital. One of the essential criteria for the development of institutions is a technological change in these ecosystems. However, the study of this phenomenon is, as a rule, fragmented and unsystematic. In particular, while the overall scope of studies on the analysis of the institutional environment of social entrepreneurship is expanding (e.g., Mair, Stephen, Uhlaner, 2010), studies dedicated to the digitalization of the institutional environment and its impact on the development of social entrepreneurship no found.

The development of social entrepreneurship is a response to the search for new innovative solutions that can satisfy the increasing needs of society in sustainable development. So, Seebode, Jeanrenaud, and Bessant (2012) suggest that in order to solve growing social problems, organizations must take on large-scale changes in the innovation process, which can create a significant impact in terms of business and social aspects. The scale of these changes can be realized by digitalizing the institutional environment that affects the development of social enterprises.

Prodanov (2018) was one of the first researchers to raise the question of the relationship between social entrepreneurship and digital transformation, noting that the accelerated

development of digital technologies both creates new opportunities for the development of this type of activity and is the cause of growing inequality. Based on the analysis, the scientist identifies possible ways of combining social entrepreneurship and digital technology. However, an equally important condition for establishing the relationship of these phenomena is to determine the impact of specific characteristics of digitalization on social enterprises.

Since digitalization is considered by researchers in two aspects: on the one hand, in the use of new technologies in entrepreneurial activity, in particular in social entrepreneurship, on the other hand, as the impact of digitalization on the institutional environment of social entrepreneurship, the research is devoted to the study of the second aspect.

In addition, the influence of these processes and the institutional environment at different stages of social enterprise development is not identical. It creates a need for the systematization of projects proposed by potential and real social entrepreneurs according to the stages of their development.

The research aim is to model the impact of digitalization of the institutional environment at various stages of social enterprise development. For this purpose, at the first stage, the basic concepts were disclosed, then the need for separate consideration of the start-up and operational stages in the analysis of a social enterprise was substantiated, and at the third stage, we developed the model through regression analysis.

1. Social entrepreneurship and institutional institutional environment digitalization

1.1 Social entrepreneurship and institutional environment

In scientific researches, there are four schools for the study of social entrepreneurship - the actual social entrepreneurship, social innovation, the EMES (The Emergence of Social Enterprise in Europe), and the English school of science (Defourny and Nyssens, 2016). As part of the study, we emphasize the importance of an innovative component as the basis for the creation of a social enterprise. Still, this criterion is not a necessary factor for social entrepreneurs. A detailed and demanding analysis of the studies was carried out by I. Alegre et.el. (2017), where the authors, based on citing articles on social entrepreneurship, identified four key approaches to the definition and study of this term, substantiated the variety of disciplines exploring this topic, and also showed the speed and dynamics of development clusters. We consider social entrepreneurship as a special form of classical entrepreneurship.

The described approaches were formed on the basis of the experience of developed countries. The formation of social entrepreneurship in developing countries is caused, as a rule,

by the historical experience of socio-economic development, which becomes both the reason for borrowing the model in developed countries and stimulates the formation of a separate vector of social development. For example, India, as a country with a fairly high level of social entrepreneurship, offers various forms of interaction between key stakeholders (government, socially-oriented businesses, social enterprises) (Singh et. al. 2017) , and also developing possible models for social entrepreneurship (Mehrotra et.el., 2015). The bulk of research on social entrepreneurship has a national and international level. At the same time, consideration of social entrepreneurship at the regional level is of particular importance in the development of a country's economy. In a study by Prochazkova and Noskova (2020), using the input-output matrices and a set of other tools, studied the impact of social entrepreneurship on the economy in the Czech Republic.

In the researches devoted to the analysis of digitalization impact on classical entrepreneurship, the systemic nature of this phenomenon is revealed. Researchers combined the concept of digital and entrepreneurial ecosystems, providing a conceptual framework for studying digitalization in entrepreneurship, including management infrastructure, the digital market, digital entrepreneurship, as well as the role of digitalization in society and the transformation of enterprise systems (Igarashi and Okada 2015).

Researches (e.g., Hajli, 2014; Schweitzer et al., 2015; Igarashi and Okada, 2015) demonstrate the viability of studies aimed at linking digitalization and creating socio-economic changes. The growth of digital technologies has led to changes in the field of entrepreneurship, as well as opened up new opportunities in terms of increasing productivity, creating added value, and developing new ways of interaction between economic agents.

The duality of the goals of social entrepreneurs, characteristic of this type of activity, reveals the importance of designing an institutional environment stimulating the development of social entrepreneurship. In this regard, we will reveal in more detail the role of the institutional environment of social entrepreneurship development.

There is much evidence of the impact of institutions on economic growth. According to the concept of North (2014), the central role of institutions in society is to reduce uncertainty by establishing stable structures for people's interaction. They consist of both informal restrictions (values, norms, prohibitions, customs, traditions, and codes of conduct) and formal rules (constitution, laws, economic rules, property rights, and contracts).

Scott (2014) divided all the institutions of entrepreneurship on regulatory, supportive, and cognitive. Most formal of these are regulatory institutions. They are norms that are attributed to regulatory legal acts. Supporting institutions are less formal, cultural, and cognitive

institutions are the most informal and exhaustive rules and beliefs, established between individuals and their social interaction. The regulatory environment refers to "formal rules and incentives that limit and regulate entrepreneurial behavior.

The regulatory environment refers to formal rules and incentives that limit and regulate entrepreneurial behavior (Seelos and Mair, 2010). The formal institutional environment is responsible for establishing rules, rewards, or punishments. As entrepreneurs in emerging markets face rapid institutional changes associated with changes in the economic climate, levels of government participation, ownership structures, and regulatory support, the regulatory environment has a significant impact on the activities of social entrepreneurs. Researchers Mair and Batillana (2012) found that regulatory factors exercise control over the processes and results of socially oriented activities. Scientists Estrin and Mickiewicz (2013) believe that socially entrepreneurial activity is more successful in the institutional environment in which a strong legal system operates, scientists suggest stimulating the regulatory environment for the development of socially-oriented activities.

The need to consider the informal institutional environment in the analysis of social entrepreneurship is primarily due to the importance of social ties for the development of this type of activity. According to the theory of Williamson, restrictions range from attitudes, beliefs, customs, norms, and traditions that govern the behavior of individuals to private judicial systems. The key difference between formal and informal institutions is that informal rules arise spontaneously and are not part of the legal system established by the state. The theory of Williamson is developed by Peyovich, also pointing to such signs of informal institutions as the spontaneity of occurrence and features of sanctions (Gartner, 1985).

A supportive environment plays an essential role in determining and shaping entrepreneurial results. According to the concept of Seelos (2010), the institutional environment through the systematization of norms of behavior creates mechanisms that shape the context of social entrepreneurship. Supporting mechanisms arise from social structures and are responsible for the formation of adequate entrepreneurial behavior. Supporting institutions are expressed through such authoritative systems like accredited, professional communities, and other professional standards.

Regarding the digitalization of the institutional environment, it is important to add that a modern trend in the development of the global economy and society, digitalization in different countries has different effects. The place of each country in the world community depends on the degree of impact of digitalization on national economic and social life (EIDES).

Over the recent decade, entrepreneurship has undergone a global transformation. The entrepreneurial opportunities were radically redefined, and the practices to pursue them have changed accordingly. These transformations are reflected in the global adoption of new organizational innovations to support entrepreneurial activity, and -above all in the emergence of a regional agglomeration of economic activity: the entrepreneurial institutional environment.

1.2 Hypothesis

The digitally-enabled entrepreneurial transformation creates important challenges for policy. Policy-makers need metrics to monitor this transformation and ensure that the productivity potential of digital advances can benefit economic and social welfare. This need sets up a measurement challenge because the digitally- enabled entrepreneurial ecosystem is a pervasive systemic phenomenon impossible to capture by count-based measures of individual-level entrepreneurial action (EIDES).

In order to further modeling the impact of the digitalization level of the institutional environment on social entrepreneurship, two hypotheses were formulated:

Hypothesis 1. The digitalization level of the institutional entrepreneurship environment has a positive influence on the development of social entrepreneurship at the start-up phase.

Start-up companies are newly born companies that struggle for existence. Social entrepreneurship deals with an idea, creativity, innovation, new product or service development, opportunity. It needs a stable, effective, and innovative institutional environment, especially in the early stages of its development.

Social entrepreneurship at the stage of formation requires quick access to all necessary information, the absence of additional costs for registering a socially-oriented company, the ability to use Internet resources to search for additional support opportunities.

Hypothesis 2. The digitalization level of the institutional entrepreneurship environment has a positive influence on the development of social entrepreneurship at the operational phase.

Social entrepreneurship at the stage of its functioning and development also needs developed institutions in terms of digitalization. Thus, free access to the market, provided by means of technological platforms and transparency of information, ensures sustainable development for social entrepreneurs. Since the main task of a social entrepreneur is the ability to balance between social and commercial goals, one of the main conditions for its effective functioning is to ensure the financial stability of the organization. Since social entrepreneurship is a new phenomenon in socio-economic interaction, new solutions are needed to support it, in particular, crowdfunding, which depends on the level of digitalization.

2. Methodology

2.1 Data

To assess the degree of digitalization coverage of any country, we used indicators that indirectly or directly measure it. Indicators that indirectly assess digitalization as a trend include, for example, the Networked Readiness Index (NRI) and the Global Innovation Index (GII).

The European Index of Digital Entrepreneurship Systems (EIDES), presented in this report, responds to the need for a tool to better understand and appraise the extent of the digital entrepreneurial institutional environment. Since social entrepreneurship is a subset of the classical, the institutional environment of social entrepreneurship meets with the environment of entrepreneurship.

This original work attempts to turn the existing index from a tool to measure general framework conditions for entrepreneurship to a tool to framework conditions for digital entrepreneurship. Following the critical review of the ESIS and a discussion of the current transformation of entrepreneurship, this report presents the method adopted to construct the EIDES with the results that the EIDES highlights for the EU 28 countries.

The structure of the revised EIDES encompasses four pillars for the General Framework Conditions (i.e., Culture and Informal Institutions, Formal Institutions, Regulation, and Taxation, Market Conditions, and Physical Infrastructure) and their associated digital counterparts. Specifically, each framework condition can be digitalized with a suitable measure of a corresponding digital context obtained made by variables that reflect the digitalization of each specific framework condition. Consequently, two versions of each framework condition appear in the index: a non-digitalized version and a digitalized one.

In the research, we have used the EIDES report because it measures the digitalization institutional environment affecting entrepreneurship in general.

We used Indexes of formal, informal, market conditions, and physical infrastructure.

Formal: Digitalization is intertwined with formal institutions for the formation of entrepreneurship in a given country. At the EIDES, the formalization, taxation, and taxation component of digitalization includes several metrics describing digital security and privacy. This pillar also includes proxies that measure how formal institutions and the regulatory environment shape digitization and competition. Reliance also reflects the digitization of public services, with an emphasis on e-government. The modernization and digitization of public services can lead to increased efficiency of public administration, citizens, and enterprises through the provision of high-quality services. The column includes indicators such as: (1) ICT

laws (WEF), (2) prevalence of Kaspersky network attacks (Secure list), (3) prevalence of digital threats, such as viruses and malware (Secure list), (4) Software Piracy Rate (WEF), (5) Internet Telephony Competition (WEF) and (6) E-Government (United Nations Department of Economic and Social Affairs).

Informal: Digitalization is rapidly shaping and changing social norms, cultural values and practices, and other informal institutions. This impact of digitalization will depend on the availability and accessibility of digital technologies and infrastructures. The digital pillar, which complements the general column of culture and informal institutions, includes proxies that show how easily citizens and enterprises can use their country's digital infrastructure. Therefore, we use four indicators to determine the availability and use of digital technologies and infrastructures by households and firms in a given country. Of these, three were obtained from the WEF database, and one from Eurostat: (1) Percentage of households equipped with a personal computer (WEF), (2) Percentage of households with Internet access at home (WEF), (3) Percentage of individuals using the Internet (WEF) and (4) Percentage of enterprises having a website (Eurostat).

Supportive institutional environment: For measuring the supportive institutional environment, we used market condition index and physical infrastructure index from the EIDES report.

The digital counterpart of the Market Conditions (DFC_P3) pillar characterizes the exploitation of online market channels (e.g., e-commerce, e-sales, e-advertisement by households and firms. By adopting digital technology, households and businesses can enhance efficiency, reduce costs, and better engage customers, collaborators, and business partners. Furthermore, the Internet also offers wider access to markets. The digital pillar includes the following six indicators derived from Eurostat and one from Translate.net database: (1) Individuals using the Internet for ordering goods or services, (2) Enterprises having received orders via computer-mediated networks, % of enterprises, (3) Enterprises total turnover from e-commerce, (4) Enterprises having done electronic sales to other countries, (5) Enterprises having done electronic sales or purchases in the rest of the world, (6) T-index, and (7) Pay to advertise on the Internet.

When determining the influence of the presented factors on social entrepreneurship, the indicator of the development of social entrepreneurship at the stage of start-up and operational activities, given in the Global Entrepreneurship Monitoring (GEM) report, was used as a dependent variable. GEM is a global entrepreneurship research conducted by the university association. GEM studies use a unified measurement system in all countries studied. By 2009

the number of countries studied reached 80. GEM annually conducts random surveys of random 2,000 adults in each country and then accumulates information on all aspects of social entrepreneurship. This study uses the 2015 GEM socially-oriented activity research report, which polled 167,793 people in 83 countries. GEM determines the indicators of the development of social entrepreneurship in the countries of the world using the percentage of people employed in socially-oriented activities and the total number of people from 18 to 64 years old. This report is the largest benchmarking study of social entrepreneurship in the world.

When determining the influence of the presented factors on social entrepreneurship, the indicator of the development of social entrepreneurship with social goal at the stage of start-up and operational activities, given in the Global Entrepreneurship Monitoring (GEM) report, was used as a dependent variable.

On the other hand, as the dependent variables, we used indicators of social entrepreneurship in different countries and analyzed whether digitalization affects social entrepreneurship specifically.

2.2 Methods

The procedure of this study based on the construction of a regression model showing the effect of digitalization of the institutional environment on the level of development of social entrepreneurship.

In the study, first of all, a list of dependent and independent variables was determined that describe both various indicators of digitalization and take into account the stage of development of a social enterprise. In the second stage, based on the results of the correlation analysis, a list of regressors was determined that affect the level of social entrepreneurship. In the third stage, a regression model was directly constructed and tested, showing the impact of individual components of digitalization on the share of social entrepreneurs at various stages of development.

The level of social entrepreneurship development is determined by the share of the population involved in this type of activity at the start-up and operational stages (Popov et al, 2018). In analyzing the impact of digitalization of the institutional environment on social entrepreneurship, other factors from the report, such as "finance" and "networking and support," were also analyzed. However, they showed no significant correlation and were removed from the study.

Also, we initially examined the performance of European countries for which data are available in the GEM and the EIDES reports (21 countries). For the purity of the experiment,

we also analyzed the indicators of classical entrepreneurship (according to GEM data) in the studied countries digitalization of the ecosystem in the case of classical entrepreneurship does not in itself have a significant effect. The result did not show any significant effect. It may be due to the influence of more important factors, such as the development of the economy or formal institutions in these countries.

When constructing the model, a preliminary analysis of the initial statistical data was made, as a result of which the most suitable type of functional dependence between the considered economic processes was revealed.

In the process of the model constructing, a preliminary analysis of the initial statistical data was made, as a result of which the most suitable type of functional dependence between the considered economic processes was revealed. In the second stage, we carried out the correlation analysis of the studied factors, which made it possible to determine whether the factors that form such a negative phenomenon as multicollinearity are present in the model. In the third stage, regression models were built directly; at the fourth stage, a study of the quality of the constructed model was conducted. The fifth stage included checking and eliminating the autocorrelation of residues in the model — the econometric models obtained during the analysis presented in the next section.

3.   Results

For testing the hypotheses formulated and further simulate the impact of institutionalization digitalization on social entrepreneurship, the following dependent variables were considered:

Y_1-share of the population involved in social goal social entrepreneurial activity in a particular country, start-up phase;

Y_2-share of the population involved in social goal social entrepreneurial activity in a particular country at the stage of operational activity.

Independent Variables:

X_1-formal institutions;

X_2-market condition;

X_3-physical infrastructure;

X_4-informal institutions.

However, due to the fact that the correlation between the development of social entrepreneurship at the start-up stage and factors turned out to be extremely weak, the regression coefficients are insignificant, and also not theoretically confirmed, they were excluded from further analysis. Thus, hypothesis 1 was not confirmed.

At the initial stage of the data analysis, it was revealed that the distribution of random variables for the tested factors and the dependent variable Y is non-linear. The distribution takes the form of a power law. In this regard, the initial data were converted into a non-linear form, and then a non-linear regression model was constructed. ANOVA results are presented in Table 1.

Tab. 1. Model results: regression statistic and ANOVA

SUMMARY OUTPUT						
Regression statistics						
Multiple R	0.4888265					
R-squared	0.2389514					
Adjusted R-squared	0.1988962					
Standard Error	0.2752961					
Observations	21					
ANOVA						
	df	SS	MS	F	Significance F	
Regression	1	0.45211718	0.45211718	5.96555397	0.02453354	
Residual	19	1.43997129	0.07578796			
Total	20	1.89208847				
	Coefficients	Standard error	t-Stat	P-value	Upper 95%	Lower 95%
Intercept	-2.9359891	1.30333282	-2.252678	0.03629515	-5.6638961	-0.2080822
X_3	1.76031006	0.72071536	2.44244836	0.02453354	0.25183546	3.26878465

After eliminating the factors that do not have a significant impact based on testing the hypothesis of the insignificance of the regression coefficients, the dependence of the level of social entrepreneurship on factor X_3 was established. The results of the regression analysis are presented in formula 1.

After conversion, this model was presented in the following form (1):

$$Y_2 = e^{-2,93} * X_3^{1,76} \tag{1}$$

At the next stage, the adequacy and reliability of the results are evaluated.

Table 1 reports the regression statistics and ANOVA. The significance of the coefficient of determination (F-statistic = 0.024) allows us to conclude that the model as a whole is reliable, and also confirms the representativeness of the sample. The determination coefficient $R^2 = 0.23$ indicates that the variation in the indicators of development of social entrepreneurship by approximately 23% depends on the indicators selected at the stage of modeling the matrix of pair correlation coefficients. Testing the null hypothesis of the insignificance of the regression coefficients showed that the selected factors do have an effect; their regression coefficients are statistically significant and significant. The value of the F-criterion and the significance level p demonstrate that the constructed model is significant at the significance level $\alpha = 0.05$.

The Darbin-Watson test used to test the model for the presence of autocorrelation of residues (dcalc = 2.42) showed that there is no relationship between the residues and they are random.

4.   Discussion and conclusion

As social entrepreneurship in the economy is a new phenomenon, we have seen very little researches dedicated to the influence of digitalization on social entrepreneurship development and its digital ecosystem. Few researches have addressed the problem of using digital technologies in social entrepreneurship.   The research is one of the first in the study of the impact of digitalization institutional environment on social entrepreneurship

Also, the second limitation is in the quantitative measurement of social entrepreneurship. The search for information database and methods of measuring social entrepreneurship has identified three approaches most commonly described in the scientific literature: Panel Study of Entrepreneurship Dynamics, (PSED II), Global Entrepreneurship Monitoring (GEM), and analysis of tax returns of NPOs in different countries of the world. PSED originated in 1993 with the study of the adult population in the state of Viscount, US. The University of Michigan, having developed the PSED methodology, continued to study households in the United States through a telephone survey of 64.000 Americans. Despite the large scale of the study, the applied methodology was not focused solely on studying social entrepreneurship, but was also directly implemented in the US territory, that is why it cannot be applied to determine the cross-country characteristics of social entrepreneurship. (Popov et al,2018). We used GEM report for 2015, evaluating the development of social entrepreneurship in different countries. Therefore, we used independent variables corresponding to this period.

Due to the difficulties associated with statistical data, this model is limited and requires further development, in particular, updating data. Although digitalization is a fast process, it is necessary to take into account the period of its influence on institutions. Due to data limitations, the time lag was not taken into account in this study.

The analysis showed that the impact of the digitalization of the institutional environment on the emergence of social entrepreneurship is negligible. It may be due to the fact that this process is influenced by other important factors, such as state support, financial support instruments, and socio-cultural characteristics in society. Thus, the digitalization of institutions does not affect the moment when social entrepreneurship enters the operational stage, and here digital infrastructure begins to influence its development, expressed in such indicators as the quality of Internet connection, its coverage, and Internet access.

Social entrepreneurship is a new socio-economic phenomenon, using all available opportunities for its development. It could mean that factors that do not have a significant impact on classical entrepreneurship at the same time are essential and significant for social entrepreneurship development. This phenomenon can also be confirmed by the thesis of Prodanov (2018). Social entrepreneurship growth is a response to the social problems increase generated by the rapid development of digital technology.

Since social entrepreneurship is innovative in its search for solutions to the social problems of society, the accessibility, speed, and quality of communication channels, primarily through the Internet and mobile communications, is an essential criterion for it. At the same time, the impact of infrastructure digitalization was shown in all studied European countries.

Digitalization processes in the economy had an important impact on the speed of interaction of participants in social and entrepreneurial projects, an increase in funding sources through the active involvement of civil society in this process. An indirect, but the no less important impact was exerted by digital platforms that accelerate the process of identifying social problems in society and creating ways to solve them. Despite the positive effect of the influence of digitalization on the development of social entrepreneurship, it is impossible not to note the growth of social problems caused by its negative impact, which is reflected in a decrease in the degree of socialization of certain groups of the young generation, increased fraud, the spread of other forms of opportunistic behavior, etc. however, these aspects are beyond the scope of this study.

The theoretical significance of the results is a description of the patterns of development of social entrepreneurship in international practice. The practical significance lies in the possibility of using the obtained results while increasing efficiency at the state level in terms of developing mechanisms to support this type of activity.

Acknowledgement

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DISFUSION OF DIGITAL FINANCIAL INNOVATIONS IN DEVELOPING COUNTRIES

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Abstract.

Purpose: The financial innovations based on the use of information technology are currently a determining factor in socio-economic development. The lacks of academic literature on the topic of modern information technologies in financial innovations justifies the investigation of the degree of penetration of digital financial innovation in developing countries.

Design/methodology/approach: The study focuses on digital financial innovations that are of practical importance for the domestic economy of households and are mainly used by individual consumers such as the use of the Internet to pay bills or make purchases and to make or receive digital payments. To assess the degree of digital financial innovation diffusion in developing countries, a regression analysis of the relevant data from the Global Findex database was used.

Findings: The result of the study confirms that digital financial innovation continues to spread throughout the world and the gap between developed and developing countries in the degree of use of digital payments is narrowing, indicating a rapid pace of their spread in developing countries.

Research/practical implications: The results of the study may serve the development of financial markets and financial services as well as to formulate government measures that will facilitate easier access of various population groups, including the poorest, to financial services, which ultimately helps to involve various sectors of the population in active economic activity and increase the welfare of the population. This study can serve as the basis for further research based on the Global Findex database.

Originality/value: This study is the first attempt to use the Global Findex database to study the digital financial innovations. Comparing indicators on the level of digital financial services in different groups of developing countries compared with developed countries can be more simple alternative to more technically sophisticated methods of studying this issue.

Keywords: financial innovation, information technology, developing countries

JEL Codes: G29, O16, O33

Introduction

Innovations, along with such concepts as sustainable growth and globalization, are at present a determining factor in socio-economic development. Successful development of the economy involves the use of the whole complex of innovative potential, including financial innovations along with scientific, technical and organizational-economic ones.

The role of financial innovations in social and economic development is to introduce novelty solutions into the financial sector that accelerate and improve the redistribution of capital, reduce its cost for market participants, minimize their risks and increase the profitability of financial products (Frame and White, 2004). Financial innovation as a process of creating and then propagating new financial instruments, as well as new financial technologies, institutions and markets (Tufano, 2003). It should be noted that modern financial innovations are inextricably linked with the use of information technology, and therefore they are often called digital financial innovations.

According to the prevailing point of view, financial innovations contribute to economic growth by expanding financing, facilitating access to financial services and increasing the efficiency of working with clients in financial institutions (Beck, 2010). Financial affordability, emerging as a result of digital financial innovation, is expanding the current consumption trend and providing opportunities for future investments. Simplified access to financial services creates greater possibilities for the population to accumulate funds by transferring money, depositing financial assets, using credit funds and diversifying investment risk.

In the academic literature on financial innovation, there is a lack of research on the topic of financial innovation in developing countries, especially related to the use of modern information technologies. Therefore, the objective of this study is to some extent to compensate for the lack of knowledge about the processes taking place in the implementation of new technologies in the financial services sector, and the aim of the article is to study the degree of penetration of digital financial innovations in the financial markets of developing countries. To meet this goal, the research focuses on two digital financial innovations that are of practical importance for the domestic economy of households and are mainly used by individual consumers: using the Internet to pay bills or making purchases and making or receiving digital payments.

The research methodology is based on a systematic analysis of the form and role of digital financial innovations in the modern household economy and the potential for their application in the financial markets of developing countries. To test the hypothesis of the diffusion of digital

financial innovation in developing countries, a regression analysis of the relevant data from the Global Findex database was used.

The study serves the development of financial markets and financial services, which ultimately helps to involve various sectors of the population in active economic activity and increase the welfare of the population. These findings can be used by politicians to formulate government measures at the legislative level that will facilitate easier access of various population groups, including the poorest, to financial services.

1.   Modern approaches to the concept financial innovations

Financial innovation refers to the creation and use of new or improved financial products or processes, technologies, institutions and markets, the main purpose of which is the effective redistribution of financial resources, increasing profitability and liquidity of assets, minimizing risks (Janícko, 2015). Financial innovations along with creating competitive advantages for initiators have the goal of reducing imperfections in the financial market, filling in the gaps that have formed in the traditional line of products or services, and also correcting information asymmetries (Zavolokina et al., 2016).

Financial innovation plays a crucial role in the financial system in two different aspects, such as product innovation, which refers to the emergence of new and innovative financial instruments in the form of financial assets, and process innovation, which refers to the efficient distribution of financial services (Tufano, 2003; Frame and White, 2004). The latter, namely the availability of financial services, expands economic activity, both at the macro and micro levels and is a prerequisite for maintaining an acceptable rate of aggregate economic growth.

New financial products in the process of turning savings into investments make it possible to more fully use savings for investment purposes and thereby effectively fill market niches and gaps (Trufano and Schneider, 2008). They expand economic activity through the accumulation of capital, effective financial intermediation and the development of financial institutions and play an important role in smoothing economic cycles (Bencivelli and Zaghini, 2012).

In modern conditions, compared with the situation ten to twenty years ago, the nature of financial innovation has primarily changed through the use of information and communication technologies. Advanced software and computational techniques emerged as the cost-effective methods which have helped financial institutions more easily evaluate borrower information, thus improving transparency (Frame and White, 2014).

Different types of digital financial innovations stand out. Among them is the release of new products, the introduction of new organizational forms, the application of new processes

or new ways of doing business. Examples of the latter are online banking systems, block chain technologies. One of the most common types of innovations in the field of financial technology is the money transfer system.

Diffusion of innovation is the process by which innovation (for example, new ideas, processes or products) is transmitted over time through certain channels among members of social systems (Rogers, 2003). This theory seeks to explain how, why, and at what speed new ideas and technologies spread across different cultures. The origin of the theory of diffusion of innovations is diverse and has its sources among several sciences, the main among which influenced the introduction of innovations among individuals and organizations called anthropology, sociology, education, industrial policy and medicine.

Dissemination of innovation refers to the process that occurs when people accept a new idea, product, practice, philosophy, and so on. In most cases, the initial few are open to a new idea and accept its use. As innovation enters into life, more and more people become open to it, which leads to the development of a critical mass. Over time, an innovative idea or product is distributed among the population until a saturation point is reached (Kaminski, 2011).

2. Role of financial innovations in developing countries

Industrialization opportunities similar to those that existed several decades ago and which allowed some then poor countries to rise to a level of economic development commensurate with the richest countries no longer exist. However, the digital revolution of the last decade has opened up new opportunities for developing countries to participate more fully in the process of innovation, investment and wealth creation based on information technology industries. Breakthrough technological changes and revolutionizing business models are redirecting global growth in areas such as fintech, big data analytics, advanced robotics, cyber security, precision medicine and agritech, which will generate significant profits in the next decade. And the developing countries still have a chance to catch up in those sectors.

Although in countries with a developed financial sector there is no positive relationship between the development of financial accessibility and economic growth, for countries with an underdeveloped and still developing financial sector there is substantial evidence in favor of a positive connection between financial innovation and financial accessibility (Arcand, 2013). The implications of financial integration in the economy are universal, resulting in an increase in consumption, a boost in productive investment, amplification in propensity to save, and an enhancement of labor opportunities (Dupas and Robinson, 2009).

Although the level of proliferation and transaction volumes of traditional financial products in developing countries is much lower, if compared to the developed countries, alternative digital products can have a significant potential for gaining the popularity. Financial services innovations, such as mobile banking, have a positive impact on overcoming financial infrastructure constraints and allowing people to access financial services (Allen et al. 2014).

In addition, access to financial services plays a crucial role in reducing income inequality and poverty while the lack of access to financial services can increase income inequality and poverty in the economy (Mookerjee and Kalipioni, 2010). The inclusion of a depriving and geographically located population in the mainstream of the financial system accelerates financial activity and at the same time increases market share.

Financial accessibility through banking financial institutions accelerates access to finance for the poor and has a positive effect on reducing income inequality in the economy, while financial intermediation stimulates inclusive economic growth. An inclusive financial system stimulates a propensity for savings, capital accumulation, productive investment and entrepreneurship, which contribute to a higher standard of living in society (Demirgüç-Kunt and Klapper, 2012).

The rapid development of communications, mobile technology and the spread of smart devices have made mobile banking more important for banks, financial institutions and users. In developing countries, mobile banking plays an important role, providing a way to overcome financial exclusion and physical distance, allowing local people to conduct financial transactions. Mobile banking can be the easiest way to provide access to financial services (Baptista & Oliveira, 2015).

3. Obstacles to the diffusion of financial innovations

The global crisis spreading mechanism has demonstrated a high degree of international interdependence and interaction between various segments of financial markets and institutions, including the strengthening of the electronic payments sector with other segments of financial markets. Since innovations are primarily aimed at risk management and overcoming regulatory restrictions, they contribute to the spread of risky and speculative financial transactions. (Akhavein et al., 2005).

The concept of innovations development mainly considers those innovations that change the behavior of consumers of such novelties (Chakravarty and Dubinsky, 2005). However, this applies to traditional financial innovations, while technology-based financial innovations have less damaging effects because the digital transformation of the financial sector is based on

innovative factors, such as relative advantage, interoperability, costs and security, as well as contextual factors, such as technological competence, size of the organization, competitive pressure and partner willingness (Zhu et al., 2006).

Spreading innovation is important for both the profitability of firms and the economic growth of countries. For these reasons, a policy aimed at reducing the main barriers to the spread of innovation is an urgent issue on the agenda of most politicians, public policy aimed at strengthening the spread of innovation (Caiazza, 2016). In developing countries, the diffusion of new technologies may encounter barriers that adversely affect the diffusion of innovations due to the aforementioned reasons; therefore, special policies are required to overcome the main barriers to the diffusion of new relevant technologies.

At the moment, there are a number of reasons why it is impossible to quickly develop and disseminate financial innovations as a key element of the financial sector of the developing countries. Undeveloped institutions that inhibit economic growth are considered the main obstacle to the innovative development of the economy. As a result, developing countries are forced to import institutions related to financial innovations and conduct cross-border transactions, since there is no legislative and infrastructure base inside.

An obstacle to the development of digital financial innovation is also the overall adverse investment climate that characterizes emerging economies. A number of negative macroeconomic factors affect the growth rate of the economy, the ability of economic agents, the movement of capital and, as a result, the efficiency of the financial sector of the economy. In such conditions, investing free financial resources in the development and dissemination of financial innovations in emerging markets attracts only a few speculative investors.

The high cost of financial innovation, together with the market's immunity to financial innovation, is a serious barrier to the spread of digital innovation in emerging economies. The development and implementation of technological solutions, the creation and development of infrastructure, as well as improving the security of existing financial instruments require large financial investments, attracting highly qualified specialists with experience in this or related activities. Currently, the financial sector in developing countries is characterized by low demand for innovative products due to its high cost and lack of information on market conditions.

The legal regulation of financial innovations both at the national and international levels is considered one of the aspects of the realization of political risk for investors interested in their development. The next obstacle to the development of digital financial innovations in developing countries is the issue of legal regulation and guarantee of fulfillment of obligations,

the formation of special requirements for organizations providing financial services against the backdrop of a threat to financial security due to the problems of offshore, corruption, underdeveloped insurance, etc.

The above mentioned barriers to the introduction of digital financial innovation in developing countries can be considered universal, that is, they are present in one form or another in all countries, despite the fact that the degree of manifestation and effect of such obstacles is different. The richer the country, the higher the level of its socio-economic development, the more actively digital technologies penetrate the financial services sector, which is an additional working hypothesis of this study. The main working hypothesis of the study is the assertion that over time the gap in the level of spread of digital financial innovations in rich and poor countries decreases, while the coverage of households with these innovations in developing countries widens.

4. Data and research methodology

For the purpose formulated above, The Global Findex database[14], created by Gallup with financial support from the Bill and Melinda Gates Foundation, was used in this study. Global Findex is collected through nationally representative surveys of more than 150,000 adults in more than 140 countries, published every three years since 2011, and includes indicators on the access and use of formal and informal financial services.

So far, three issues have been released. The last two issues also include information on the use of digital financial technologies, such as the use of mobile phones and the Internet for financial transactions and others. The third issue of the database points to advances in digital technology, which are key to meeting the World Bank's goal of universal financial access by 2020.

According to Global Findex, financial accessibility is growing all over the world and from 2011 to 2017; the number of adult citizens who have opened a financial account has increased by 1.2 billion. However, large differences remain in the degree of ownership of accounts at the country level. So in high-income countries, 94 percent of adults have an account, while in developing countries only 63 percent. Between 2014 and 2017, the proportion of adults who have an account with a financial institution or through a mobile money service has grown worldwide from 62 percent to 69 percent.

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[14]Available from: https://globalfindex.worldbank.org/sites/globalfindex/files/2018-08/Global%20Findex%20Database.xlsx

In general, Global Findex data indicate an increase in financial affordability, the 2017 edition shows that the use of a mobile phone and Internet access provide new opportunities to reduce the number of adult citizens without a financial account and increase the frequency of its use. The Global Findex database gives an idea of not only who owns the financial account, but whether and how people can use their account for digital payments.

It should be noted that the use of digital technologies alone is not enough to increase financial availability. In order for people to be able to use digital financial services, a developed payment system, reliable physical infrastructure, relevant rules and effective consumer protection mechanisms are needed. In addition, financial services should be adapted to the needs of less protected groups, such as women, low-income, poorly educated, and those who use financial services for the first time, which may have both a low level of financial literacy and technological skills.

Currently, technological advances have challenged financial service providers, as a result of which the very nature of the sale and purchase of financial services has changed. With time, more and more people who are not covered by banking services have access to digital technologies in the form of a mobile phone and access to the Internet in some form - whether through a smart phone, home computer, Internet cafe, or in another way. At the same time, around the world, about 1.1 billion, which is about two-thirds of all adults without adult banking, have a mobile phone.

Having a mobile phone and access to the Internet expands the range of opportunities for gaining access to financial services and can potentially open access to mobile money and other financial services. Mobile phones can eliminate the need to travel long distances to financial institutions. Thus, by reducing the cost of providing financial services, digital technologies can increase their availability.

Three data series for 2014 and 2017 were selected for this study, including adult responses (age 15+) regarding the use of financial services over the past 12 months. The first is the use of the Internet to pay bills or make purchases, presented as the proportion of respondents who reported paying bills or making purchases using the Internet (INTP14, INTP17). The second is about making or receiving digital payments (DIGP, 14 DIGP17). Third, it is the possession of an account, as a percentage of respondents who reported that they have an account (independently or jointly) with a bank or financial institution of a different type or personally use the mobile money service (acc14, acc17). The last relates to more traditional financial products and is used in this study for contrast.

Tab. 1: Variables

Variable	Obs
INTP14	proportion of respondents paying bills or making purchases using the Internet in 2014
INTP17	proportion of respondents paying bills or making purchases using the Internet in 2017
DIGP14	proportion of respondents making or receiving digital payments in 2014
DIGP17	proportion of respondents making or receiving digital payments in 2017
ACC14	proportion of respondents having an account with a bank or financial institution in 2014
ACC17	proportion of respondents having an account with a bank or financial institution in 2017

Source: Author.

Tab. 2: Data description

Variable	Obs	Mean	Std. Dev.	Min	Max
INTP14	142	.1740533	.2183419	0	.7897834
INTP17	144	.2750108	.2615992	.0051374	.8948043
DIGP14	142	.4363766	.3040219	.0276433	.9921191
DIGP17	144	.5375534	.2827452	.0734846	.9939409
ACC14	142	.5516363	.3061026	.0644848	1
ACC17	144	.613826	.2667822	.0857	.9991737

Source: Author.

Worldwide, 52 percent of adults or 76 percent of account holders confirm that they have made or received at least one digital payment using the Internet or mobile phone. The Internet and mobile phones are an alternative to debit and credit cards for making payments from a financial account. In high-income countries, 51 percent of adults (55 percent of account holders) reported at least one financial transaction last year using a mobile phone or the Internet. In developing countries, 19 percent of adults (30 percent of account holders) reported having made at least one direct payment using their mobile phone or the Internet.

To test the working hypothesis of this study, a regression analysis was used, where one of the Global Findex database indicators is used as the dependent variable and a dummy variable is used as independent variables, which characterize belonging to a certain group of countries according to income level. The general form of the regression equation has the following form:

$$X = \beta_0 + \beta_1 d_1 + \beta_2 d_2 + \beta_3 d_3 + \epsilon \ , \tag{1}$$

where X is the proportion of respondents who reported paying bills or making purchases using the Internet (INTP14, INTP17), about making or receiving digital payments (DIGP14, DIGP17) that have an account (alone or jointly) with a bank or financial institution of another type, or

they personally use the mobile money service (ACC14, ACC17), d_1 - countries with low income, d_2 - countries with income below the average, d_3 - countries with income above the average. By default, high-income countries are considered.

5. Results and discussion

Multiple regression estimates for each of the above series of data were carried out in accordance with the year the database was released, namely 2014 and 2017. The results of the regression analysis are presented in the following tables.

Tab. 3: Regression Results on the use of the Internet to pay bills or make purchases

	Coef.	Std. Err.	t	P>t
INTP14				
d1	-.4373056	.0291389	-15.01	0.000
d2	-.4200686	.0245425	-17.12	0.000
d3	-.361422	.0248917	-14.52	0.000
_cons	.4513492	.0168233	26.83	0.000
Number of obs	142		R-squared	= 0.7443
F(3, 138)	= 133.93		Adj R-squared	= 0.7388
Prob > F	= 0.0000		Root MSE	= .11159
INTP17				
d1	-.5540953	.0331139	-16.73	0.000
d2	-.5088249	.0288986	-17.61	0.000
d3	-.4008779	.0288986	-13.87	0.000
_cons	.6074205	.0196726	30.88	0.000
Number of obs	144		R-squared	= 0.7564
F(3, 140)	= 144.90		Adj R-squared	= 0.7512
Prob > F	= 0.0000		Root MSE	= .13049

Source: Author.

Tab. 4: Regression Results on making or receiving digital payments

	Coef.	Std. Err.	t	P>t
DIGP14				
d1	-.6616916	.0392122	-16.87	0.000
d2	-.5954793	.0330268	-18.03	0.000
d3	-.4038668	.0334967	-12.06	0.000
_cons	.8076723	.0226392	35.68	0.000
Number of obs	142		R-squared	= 0.7612
F(3, 138)	= 146.63		Adj R-squared	= 0.7560

Prob > F	= 0.0000		Root MSE	= .15017
DIGP17				
d1	-.6086021	.0382391	-15.92	0.000
d2	-.5339751	.0333714	-16.00	0.000
d3	-.3543319	.0333714	-10.62	0.000
_cons	.8734014	.0227174	38.45	0.000
Number of obs	144		R-squared	= 0.7219
F(3, 140)	= 121.15		Adj R-squared	= 0.7160
Prob > F	= 0.0000		Root MSE	= .15069

Source: Author.

Tab. 5: Regression Results on the possession of an account

	Coef.	Std. Err.	t	P>t
ACC14				
d1	-.6862476	.0415729	-16.51	0.000
d2	-.5646312	.0350152	-16.13	0.000
d3	-.3149102	.0355134	-8.87	0.000
_cons	.8950852	.0240022	37.29	0.000
Number of obs	142		R-squared	= 0.7352
F(3, 138)	= 127.73		Adj R-squared	= 0.7295
Prob > F	= 0.0000		Root MSE	= .15921
ACC17				
d1	-.5828707	.0376741	-15.47	0.000
d2	-.4786425	.0328783	-14.56	0.000
d3	-.301241	.0328783	-9.16	0.000
_cons	.9167737	.0223818	40.96	0.000
Number of obs	144		R-squared	= 0.6968
F(3, 140)	= 107.25		Adj R-squared	= 0.6903
Prob > F	= 0.0000		Root MSE	= .14846

Source: Author.

The R-square coefficient in this example is between 0.7 and 0.76, which means that the calculated parameters of the model by at least 70% explain the variance of the dependent variable, which indicates a very good fit of the regression line to the original data. The indicators of the determination coefficient and the R-squared coefficient for the first two models are higher than for the third model. Also, the values of the standard calculation error for the first two models are higher than for the third.

The existing regression model is qualitative according to the value of the standard calculation error, which is less than 0.15, which is quite an acceptable result. The fact that the p-value in all cases is equal to zero means that there is a statistically significant linear relationship between the spread of digital financial innovation and the level of wealth. The F-statistic is well above the critical value for such a number of degrees of freedom, and the p-value is close to zero, that is, the constructed regression model is statistically significant and practically acceptable.

All the sign of the estimated parameters are in the line with expectations. Thus, the regression function is defined, interpreted and justified, and the accuracy assessment of the regression analysis meets the requirements, therefore, we can assume that the constructed model and the predicted values have sufficient reliability.

The regression results for different years are compared with each other to identify trends, as well as with respect to other data series. In the table below the indicators on the group of High income countries are presented in absolute values while for other groups of countries they are relative to the first group.

Tab. 6: Summary results of regression analysis

Group of countries	intp14	intp17	digp14	digp17	acc14	acc17
High income	.4513492	.6074205	.8076723	.8734014	.8950852	.9167737
Low income	-.4373056	-.5540953	-.6616916	-.6086021	-.6862476	-.5828707
Lower middle income	-.4200686	-.5088249	-.5954793	-.5339751	-.5646312	-.4786425
Upper middle income	-.361422	-.4008779	-.4038668	-.3543319	-.3149102	-.301241

Source: Author.

The use of the Internet to pay bills or make purchases in the indicated period grew in all countries, while the gap between rich and poor countries did not narrow, but even widened. So in the richest 60 percent of households used these products, having grown from 45 percent three years earlier. But as in the poorest countries, countries with lower and higher than average incomes, the gap has increased compared to 2014.

The number of digital payments around the world has grown significantly, and the proportion of adults using digital payments has doubled. In high-income countries in the study period, it increased from 80 percent in 2014 to 87 percent in 2017. In less affluent countries, there was also an increase in the use of digital payments, and the share of digital payments in 2017 not only increased, but also narrowed the gap from highly profitable countries compared to 2014.

In both developed and developing countries, the proportion of adults with a financial account continues to grow. In 2017, among the richest adults, almost 92 percent were account holders and over the study period it grew by only 2 percentage points. Although inequalities in account ownership between rich and poor countries persist, the gap has narrowed. This is especially noticeable in the case of the poorest countries and countries with incomes below the average. At the same time, the gap has not substantially changed in developing countries with incomes above the average.

According to the analysis of the data series of the Global Findex database, digital financial innovations continue to spread throughout the world and in developing countries along with their development in the most developed countries. The global gap between developed and developing countries for digital payments has narrowed significantly, indicating the rapid pace of their spread in developing countries. In high-income countries, as well as in developing countries with an income level above the average, the degree of availability of financial accounts apparently reached the level of saturation and changed very little during this period. Contrast this with data on a significant increase in the number of account holders in low-income and lower middle-income countries

At the same time, the use of the Internet to pay bills or buy something on the Internet in the study period was on the rise in all countries. However, the gap between rich and poor countries has widened. This is explained by the fact that fixed access to the Internet requires high infrastructure costs, which households in developing countries cannot always afford. At the same time, mobile payments in developing countries are growing faster due to the fact that mobile communications are more affordable.

The study also confirms the proposition of the second hypothesis, namely that the spread of digital financial innovation depends on household income levels. At the same time, in developing countries with incomes above average, the speed of introducing new technologies in the financial sector is more similar to high-income countries than to other groups of developing countries.

Conclusion

The development of financial innovations is determined by the objective needs of financial markets and acts as tools for risk management, capital accumulation and liquidity in order to increase the economic efficiency of the economy. Innovation affects the effectiveness of the global financial system by diversifying financial services, reducing transaction costs and transforming risks. The digital revolution offers opportunities for developing countries to create

an economy based on information technology. In countries with underdeveloped and developing financial sectors, there is a positive correlation between financial innovation and economic growth. At the same time, there are a number of barriers that impede the development and spread of financial innovation as a key element of the financial sector in developing countries. The introduction of innovations leads to institutional changes in financial accessibility, which is the link between financial accessibility and financial development, which is manifested in a decrease in dependence on traditional factors and models for the provision of financial services, in particular, the factor of geographical location, established institutional structures. Increasing financial accessibility through the integrated use of new products and information technologies, electronic interbank and financial trading systems introduces the non-banking population into the official financial system so that it can use financial services such as savings, deposits, credit lines and insurance.

The analysis of the Global Findex database confirms that digital financial innovation continues to spread throughout the world. The gap between developed and developing countries in the degree of use of digital payments has narrowed significantly, which indicates the rapid pace of their spread in developing countries. At the same time, although the use of the Internet to pay bills or purchases in the study period was on the rise in all countries, the gap between rich and poor countries has widened, which is explained by the higher costs of fixed access to the Internet while more affordable mobile communications make mobile payments to growing faster. Moreover, the spread of digital financial innovation depends on household income levels.

This study can serve as the basis for further research based on the Global Findex database. Among the potential areas of research, one can single out a study of the relationship between various types of digital financial services, as well as between digital financial services and traditional banking products. In addition, it is also advisable to repeat the analysis used in this study based on new releases of the database.

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WHERE IS THE LINK BETWEEN ENTREPRENEURIAL ECOSYSTEM COMPONENTS AND COUNTRY'S INNOVATION OUTPUT? A GLOBAL STUDY

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Abstract

Purpose: The aim of the research is to detect the relationship between entrepreneurial ecosystem (EE) components and innovation output of countries, and to determine whether the strength of this relationship depends on country's cluster affiliation at different income levels.

Design/methodology/approach: To globally examine the strength of relationship between EE elements and innovation output, we analysed the correlation between the pillars of Global Entrepreneurship Index (GEI) and Global Innovation Index (GII) output sub index. To analyse if this relationship depends on income level (thus, development level) of a country, we divided countries into clusters and repeated the process in these separate groups. The analysis was performed on a set of 117 countries that are ranked in both GEI and GII report for 2019.

Findings: The results show a significant moderate to high positive correlation between EE dimensions and innovation output (both Creative output and Knowledge and technology output). Technology Absorption and Process Innovation show the strongest relationship with the examined innovation output measures. Additionally, the results show that this relationship considerably varies among the observed groups of countries clustered by the income level.

Research/practical implications: The results can be used by policymakers to get more insights on the ecosystem institutional framework relationship with country's innovation output. By further deeper examination of concrete indicators feeding into these pillars, implications can be derived for the ecosystem improvements. This implies that it is possible to identify the domains of the EE that could be strengthened for better innovation performance of a country. It is also shown that there is a rationale behind observation of countries by their income level, for creating appropriate strategic directions for boosting innovation output through strengthening their EE.

Originality/value: The results of the empirical research show the relationship between the EE components and innovation output and how the relationship varies across countries based on their level of development (income). The results are based on the data of globally recognized and widely applied methodologies, GEI and GII (Innovation Output Sub index).

Keywords: entrepreneurial ecosystem, innovation performance, creative output, knowledge and technology output

JEL Codes: O3, O50, L26

Introduction

The studies of the interdependence between innovation and entrepreneurship have been present since the early twentieth century. Joseph Schumpeter is considered as the pioneer of the approach that sees innovation as a key element of economic development. In 1912, he set out a model of entrepreneurial innovation, according to which basic discoveries are mostly of exogenous origin and it is necessary for a group of exceptional entrepreneurs to take the risk of further development of discoveries coming from universities, institutes, development centres and other external sources (Sledzik, 2013).

Entrepreneurial ecosystem (EE) concept emerged in the recent years, understood as an interdependent set of actors that is governed in such a way that it enables entrepreneurial action (output). It is a popular concept that "explains the persistence of high–growth entrepreneurship within regions" (Spigel, 2017). Innovation is most likely to occur within an EE that "typically involves a set of agents, institutions, activities or processes, and surrounding culture" (Feldman, et al., 2019). In recent years, a significant rise in academic interest in the topic of EE is seen (Feldman et al., 2019), resulting in various models of EE (e.g. Isenberg, 2011; Hao et al., 2017). In their work, Cavallo et al. (2019) provide a comprehensive understanding of EE, setting an up-to-date agenda for future research.

In this paper, we challenge the question on the strength of the relationship between EE components and country's innovation output. More concretely, we observe the correlation between three GEI sub-indices and its 14 pillars with GII innovation output sub-index and its pillars' values. Additional analysis is performed according to country's cluster affiliation referring to the income level, to understand if the intensity of this relationship differs among clusters, and in which domains.

The paper is organised as follows. Section 1 provides a brief literature review on EE models and explains the connection between EE and entrepreneurial activity based on innovation. Section 2 presents the methodology, sample and rationale behind the selection of indices for the research. Section 3 presents the results. Final section concludes the paper.

1.   Entrepreneurial ecosystem analysis and innovation performance

EE focuses on cultures, institutions, and networks that build up within a region over time (Stam & Spigel, 2016). Thus, EE research emphasizes the rise of productive entrepreneurship as a result of interconnected agents, institutions and surrounding culture within a focal territory (Acs et al., 2014). Even though the concept of EE gained popularity in recent years, the theoretical

foundation and understanding of ecosystems remains underdeveloped, making it difficult to understand its structure and influence on the entrepreneurship process (Spigel, 2017).

In contemporary literature, various EE models emerged. Isenberg (2011) recognizes six domains within the entrepreneurial system that combine in complex ways: an encouraging culture, enabling policies and leadership, appropriate finance availability, quality human capital, venture friendly markets, and a variety of institutional supports. Global Entrepreneurship and Development Institute recognizes EE as a "mix of attitudes, resources, and infrastructure". Hao et al. (2017) emphasize the central role of the firm within an EE, indicating six relevant dimensions of the ecosystem: The Firm, Infrastructure and Institutions, Education and Public research System, Innovation Policies, Market Demand, and Other Firms. WEF (2013) lists eight pillars that make up a successful ecosystem: Accessible markets, Human Capital, Funding and finance, Support systems, Government and regulatory framework, Education and training, Major universities as catalysts and Cultural support.

Output of an EE is entrepreneurial activity which refers to the process by which individuals recognize and create opportunities for innovation, while outcome refers to the new value created in society based on innovation created in entrepreneurial process (Stam & Spigel, 2016). Ordeñana et al. (2019) emphasize that not all entrepreneurship matter for economic growth, but only the growth-oriented entrepreneurship based on innovation. Apart from inputs and capacity, creating a community for innovation where government, academia, industry and the citizenry are all participants in the innovation process is needed for better innovation performance (Ranga Bagu et al., 2013). Thus, the need to study elements of the ecosystem that boost innovation performance emerge as an important topic for the policy makers and academics.

Nicotra et al. (2018) show that various single factors were analysed in the literature to identify the EE influencing factors for productive entrepreneurship, such as market accessibility, human capital and financial resources. Levi Jakšić et al. (2015) created a general model which proposes a framework for measuring Technology Innovation Management and Entrepreneurship performance related to the key elements of the Triple Helix model. Based on the proposed model, the government sector was further analysed resulting in indicators for measuring and monitoring government performance in technology and innovation management (Marinković et al., 2016). Measurement of entrepreneurial ecosystem and identification of cross-country determinants of entrepreneurial activity is present in various recently published research which usually include different indicators and country-level measures (see e.g. Nikolaev et al., 2018; Roman et al., 2018; Stam, 2018). Dvouletý (2018) provides an interesting view and further discussion on this topic by performing an empirical assessment of the

differences across various indicators on an example of a harmonized sample, empirically supporting that „no matter what measure of entrepreneurship or self-employment we choose at the country level, the determinants indicate the same direction of impact". Still, the causal relation between ecosystem factors and productive entrepreneurship has not been investigated (Nikotra et al., 2018; Stam & Spigel 2017).

The main purpose of this paper is to conduct a global study on the relationship between EE components and innovation output of countries. Global Entrepreneurship Index (GEI, 2018) was developed as a relevant EE metric that measures the "health of EE", observing entrepreneurial system as the complex interactions between entrepreneurial attitudes, abilities and aspirations at country level (Acs et al., 2014). On the other hand, Global Innovation Index (GII, 2019) provides detailed metrics about countries' innovation performance. These two measures are used for analysing the research questions posed in the paper.

2. Methodology and research design

To evaluate the performance of an EE one must consider all relevant elements and incorporate them into a single measure. It is a very complex task which can be solved by introducing composite indices that aggregate more single measures into one. However, creating an index that measures the performance of an EE is a challenging task due to the complexity and numerous elements of an EE. Global Entrepreneurship Monitor (GEM) is a consortium that performs a study on entrepreneurship around the world by directly interviewing entrepreneurs (GEM, 2019). Although GEM developed a comprehensive methodology that incorporates entrepreneurial framework and conditions within an ecosystem, as well as entrepreneurial behaviour and attitudes, the scope of the countries is not big enough to derive proper conclusions since some important national ecosystems are missing from the analysis for the recent years (Denmark, Finland, Israel, Norway, Hong Kong, etc). Nevertheless, in 2009 the Global Entrepreneurship Development Institute has developed the Global Entrepreneurship Index (GEI), a widely accepted methodology that provides a detailed look at the 137 national entrepreneurial ecosystems (GEI, 2018). This composite index provides policymakers a tool for understanding countries' entrepreneurial strengths and weaknesses. In this paper, we used GEI as a relevant measure of an EE performance. GEI is calculated as an aggregation of 3 sub-indices (the 3As) compounded of several pillars: 1) *Entrepreneurial attitudes* (5 pillars), 2) *Entrepreneurial abilities* (4 pillars), and 3) *Entrepreneurial aspirations* (5 pillars).

On the other hand, innovative performance of a country though years has been evaluated by Global Innovation Index (GII, 2019). The methodology has been regularly evaluated and

updated, and in 2019 it measured innovative performance in 197 countries. The index is divided into innovation inputs and outputs and uses efficiency approach by evaluating how successful are countries in achieving a certain level of outputs with a given level of inputs. In this research, we focused on innovation output of countries which is compounded of 2 sub-pillars: *Creative Output* and *Knowledge and Technology Output*. The research framework is given in Figure 1.

Fig. 2: Research Framework
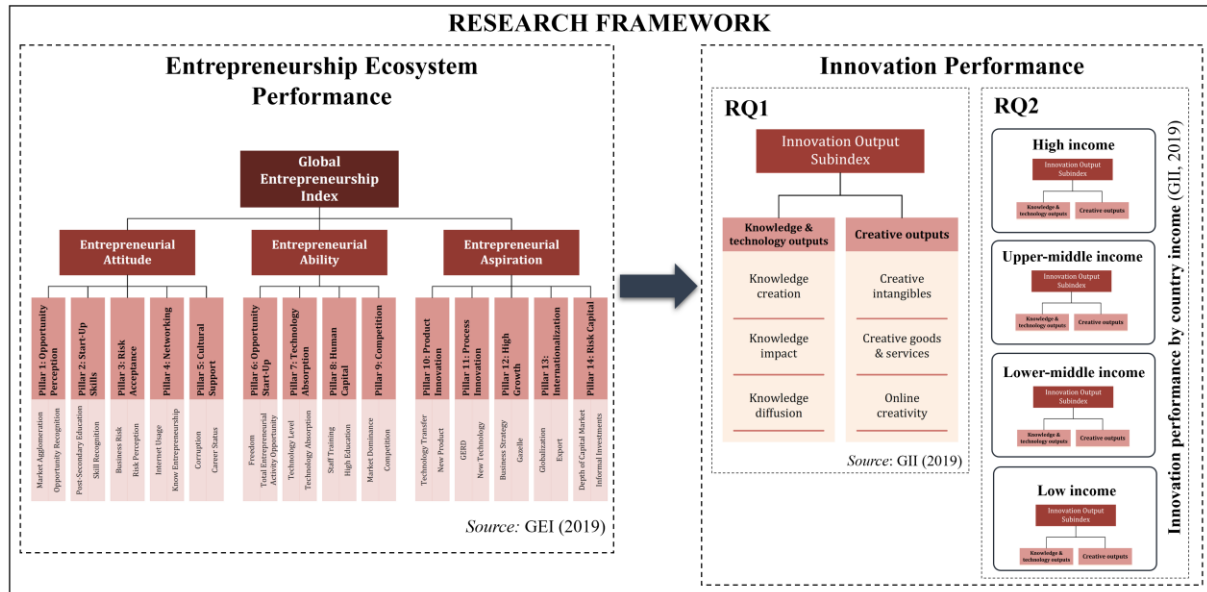
In the first step of the research, to examine the nature of relationship between ecosystem elements and innovative performance we analysed the Pearson's correlation coefficient between the pillars of GEI and GII. To analyse if there is a difference in this relationship based on the level of income, we divided countries into clusters and calculated Pearson's correlation coefficient for these separate groups. The clustering of countries was performed based on the data from the official GII report for 2019 (GII, 2019). Analysis was performed on a set of 117 countries that are ranked in both GEI and GII report.

3.   Results and discussion

The results presented in Table 1 imply statistically significant correlation between each element of GEI and GII. If we observe the sub-indices, there is a high positive correlation with both pillars of innovation and 3As. However, there is slightly higher correlation with *Creative Outputs*, than with the *Knowledge & Technology Output*. In addition, entrepreneurial abilities have the strongest relationship with both outputs. For a better insight, we calculated the coefficients of the entrepreneurship pillars. The results imply medium to strong positive correlation of entrepreneurial pillars with each innovation pillar. The highest positive

correlation of innovation outputs is identified with *Process Innovation* (0.8317) and *Technology Absorption* (0.8267). However, *Process Innovation* is more correlated with *Knowledge & Technology Outputs*, while *Technology Absorption* has stronger relationship with *Creative Outputs*. Process innovation pillar measures the use of novice technologies by new start-ups and capabilities of a country to perform applied research, while *Technology Absorption* outlines the level of technology of a country's start-ups in combination with the ability of a start-ups to absorb the technology. So, the ecosystems with high ability to absorb technology tend to have higher creative outputs, while the usage of new technologies and applied research has a strong relationship with *Knowledge & Technology Output*. These results are expected, while it may be interesting to comment on the lowest level of correlation identified with *Product Innovation* and both pillars of *Innovation Output*. The calculated correlation is statistically significant, but moderate, which signifies that creation of new products and level of technology transfer does not necessarily lead to high level of creative, knowledge, and technology outputs. In addition, *Networking* is identified as another interesting entrepreneurial pillar, since it has moderate correlation with the innovative performance, but the value differs among the two types of outputs. The relationship of *Networking* within the EE is stronger for the *Creative Outputs* than the *Knowledge and Technology Output.*

Tab. 10: Correlation coefficient between GII Innovation Output pillars and GEI pillars

All countries		Innovation output	Creative Outputs	Know. & Tech. Outputs
Entrepreneurial Abilities		0.8349[**]	0.8168[**]	0.7883[**]
Entrepreneurial Aspirations		0.8258[**]	0.809[**]	0.7789[**]
Entrepreneurial Attitudes		0.7578[**]	0.7799[**]	0.6852[**]
Entrepr. Abilities	Opportunity start-up	0.7463[**]	0.7461[**]	0.6918[**]
	Tech. Absorption	0.8267[**]	0.8129[**]	0.7772[**]
	Human Capital	0.5871[**]	0.5551[**]	0.5699[**]
	Competition	0.7295[**]	0.6895[**]	0.7081[**]
Entrepr. Aspirations	Product Innovation	0.5076[**]	0.5083[**]	0.4705[**]
	Process Innovation	0.8317[**]	0.7632[**]	0.8253[**]
	High Growth	0.5903[**]	0.5655[**]	0.5671[**]
	Internationalization	0.6844[**]	0.6968[**]	0.6248[**]
	Risk Capital	0.6714[**]	0.6683[**]	0.6245[**]
Entrepr. Attitude	Opportunity Perception	0.5836[**]	0.6116[**]	0.5193[**]
	Start-up skills	0.5669[**]	0.6073[**]	0.4934[**]
	Risk acceptance	0.6941[**]	0.6798[**]	0.6549[**]
	Networking	0.5202[**]	0.5825[**]	0.4328[**]
	Cultural Support	0.6372[**]	0.643[**]	0.5863[**]
No. of observed countries		117		

[**]Statistically significant at level <0.01
Source: SPSS IBM 25, author's elaboration of the data from GEI (2019) and GII (2019).

To determine if the relationship between the examined elements differ in ecosystems with a different level of income (thus, development), we conducted additional analysis and measured

Pearson's correlation coefficient within each cluster of countries. The list of the countries grouped by income level is given in the official GII report for 2019 (GII, 2019, pp. xxii). The calculated correlations for countries grouped by the income level are given in Table 2. There are 4 groups of countries: 1) high income, 2) upper-middle income, 3) lower-middle income, and 4) low income. The calculated correlations indicate not all dimensions of EE performance detect relationship with innovative performance in countries with different income level. Furthermore, the strength of relationship fairly differs, and the significance of components varies among the examined groups.

Tab. 11: Correlation coefficients within groups of countries with different income level

Entrepreneurial Ecosystem Dimensions	High income countries			Upper-middle income countries			Lower-middle income countries			Low income countries		
	IO	CO	K&T	IO	CO	K&T	IO	CO	K&T	IO	CO	K&T
Entr. Abilities	0.77**	0.72**	0.74**	0.29	0.16	0.33	0.57**	0.52*	0.54**	0.35	0.36	0.22
Entr. Aspirations	0.73**	0.66**	0.71**	0.48**	0.42*	0.44*	0.50*	0.42*	0.51*	0.66*	0.49	0.54*
Entr. Attitudes	0.62**	0.64**	0.55**	0.12	0.12	0.10	0.21	0.25	0.16	0.13	0.15	0.06
Opportunity start-up	0.59**	0.56**	0.55**	0.18	0.19	0.13	0.33	0.28	0.34	0.27	0.29	0.17
Techn. Absorption	0.85**	0.81**	0.81**	0.07	0.04	0.08	0.41	0.47*	0.32	-0.07	0.02	-0.11
Human Capital	0.21	0.13	0.25	0.25	0.07	0.34	0.58**	0.55**	0.55**	0.29	0.20	0.25
Competition	0.71**	0.65**	0.69**	0.07	0.02	0.10	0.10	-0.06	0.20	0.39	0.38	0.26
Product Innovation	0.45**	0.43*	0.42*	0.08	0.17	0.01	0.13	0.05	0.18	0.00	-0.10	0.07
Process Innovation	0.79**	0.67**	0.81**	0.66**	0.51**	0.66**	0.43*	0.33	0.46*	0.65	0.52	0.51*
High Growth	0.30*	0.23*	0.33*	0.30	0.18	0.34	0.39	0.39	0.35	0.44	0.29	0.39
Internationalization	0.46**	0.42**	0.45**	0.14	0.23	0.04	0.31	0.23	0.33	-0.26	-0.04	-0.32
Risk Capital	0.26	0.23	0.26	0.61**	0.52**	0.57**	0.50*	0.47*	0.48*	0.48	0.39	0.37
Opportunity Perception	0.52**	0.56**	0.43**	-0.25	-0.18	-0.26	-0.12	-0.12	-0.10	0.01	-0.08	0.06
Start-up skills	0.28	0.29*	0.25	0.19	0.28	0.08	0.61**	0.59**	0.56**	-0.04	-0.06	-0.00
Risk acceptance	0.50**	0.47**	0.49**	0.07	-0.07	0.17	0.14	0.03	0.20	0.03	0.28	-0.17
Networking	0.24	0.32*	0.17	0.24	0.24	0.19	-0.10	0.06	-0.21	0.20	0.12	0.19
Cultural Support	0.55**	0.53**	0.51**	-0.09	-0.07	-0.09	0.03	0.11	-0.03	0.16	0.19	0.07
No. of observed countries	48			32			23			14		

*Statistically significant at level <0.05
**Statistically significant at level <0.01

IO – Innovation output
CO – Creative output
K&T – Knowledge & Technology Output

Source: SPSS IBM 25, author's elaboration of the data from GEI (2019) and GII (2019).

High-income countries have moderate to high positive correlation with all three sub-indices. However, the examination of pillars shows that *Human Capital* and *Risk Capital* do not significantly correlate with the innovative performance. *Networking* and *Start-up skills* tend to have similar values, but there is a low significant correlation with *Creative outputs*. The highest correlation with the outputs in high income countries has *Technology Absorption* (above 0.81). However, in the upper-middle income countries this pillar's correlation with the innovative performance has correlation coefficient slightly above 0, and in lower-middle

countries is only moderately correlated with *Creative outputs*, while in low income countries even has negative correlation, but not a significant one.

Upper-middle income countries have statistically significant moderate correlation only with the sub index of *Entrepreneurial aspirations*. *Process Innovation* and *Risk Capital* (amount of informal investment in start-ups and the depth of the capital market) are having significant moderate to high correlation with innovation outputs, and *Knowledge & Technology Output* shows stronger relationship than *Creative Outputs* with both entrepreneurial pillars. It can also be noted that, although it is not statistically significant, it is very surprising that *Opportunity Perception* (opportunity driven motivation and quality of governance within a country) has negative correlation with innovation output in upper-middle countries.

Lower-middle countries (in contrast to the upper-middle) have the highest correlation between *Entrepreneurial Abilities* and innovative outputs. The dimension that has the strongest relationship with innovation output is *Start-up skills* (entrepreneurial skills and education) and *Human Capital* (education level and labour market) which is quite different than in other country groups where they do not detect any significant correlation with innovation output. This signifies that in lower-middle countries innovative performance has highest relationship with the education of the people.

The smallest group of the countries – Low income has statistically significant moderate correlation only with the *Entrepreneurial Aspirations*. Among the examined pillars, statistically significant correlation is detected for *Process Innovation* and *Knowledge & Technology Outputs* (0.51).

The results shown in Table 2 indicate that the strength of the relationship between EE dimensions and innovation output depends on the level of income of the observed country. As remarked by Nikotra et al. (2018) and Stam and Spigel (2017), the causal relation between ecosystem elements and productive entrepreneurship has not yet been investigated enough. The results of this paper could provide a starting point for further analysis of this relationship, which would be valuable for creating policies aimed at boosting innovation output of counties. The significance and the correlation coefficients among the pillars are quite different within the examined groups which indicates that certain dimensions of EE might have higher influence in different countries depending on the income level.

Conclusion

The main aim of the research in the field of EE is understanding of the circumstances and the nature of places in which entrepreneurial activity flourishes. In such a manner, this paper aims to explain the link between EE components and innovation output of countries observed through *Creative output* and *Knowledge and technology output.* Additionally, it tries to explain whether these relationships vary between groups of countries clustered by their income level.

The results show that EE performance measured by GEI has moderate to high positive correlation with the results of innovative performance observed through *Creative output* and *Knowledge and technology output.* In the observed domains of EE, *Technology Absorpti*on and *Process Innovation* have the strongest relationship with the innovation output meaning that ecosystems with high ability to absorb and create new technology (not product), and strong science tend to have better innovation output. Nevertheless, the research within the country groups show that this relationship is not the same when it comes to different level of development. While high income national ecosystems are mostly correlated with the mentioned *Technology Absorption* and *Process Innovation*, low-middle income countries' innovation output has the highest correlation with the education and entrepreneurial skills (*Human Capital* and *Start-up skills*).

These results imply that it is possible to identify the domains of the ecosystem that could be strengthened for better innovation performance of a country based on its level of development. Logical clustering approach (Rakićević et al., 2019) could further be used for such analysis since it tracks the similarity and dissimilarity of countries through the logical measure of proximity, including intuitive reasoning into the clustering process. By using such an approach, it would be possible to create more comprehensive clusters of countries and model interactions among the observed measures, but also the effect of compensation among the counterparts of the observed indices. By further deeper examination of concrete indicators feeding into these pillars, implications can be derived for the ecosystem improvements.

Although GEI is a subject of critique since it does not capture entrepreneurial behaviour, but rather a mix of attitudes, abilities and aspirations, the results of this research can be used as a starting point by the policymakers to get more insights on the parts of the EE institutional framework that can be improved for achieving higher innovation performance of a country. This would contribute to a responsible governance of an EE and systemic support to innovation activity. Finally, rethinking indicators used in the global studies are always a subject of interest and should be examined carefully in the further research.

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RATIONALITY OF STOCK MARKETS – A CRITICAL PERSPECTIVE ON MARKET-BASED MODELS OF INNOVATION INFLUENCE ON FIRM PERFORMANCE

Norman Hendrik Riedel

Abstract

Purpose: The aim of the study was to investigate the relation between innovation and stock market performance as well as the suitability of stock-market firm performance as indicator for projected future income resulting from current innovation activities.

Design/methodology/approach: A model for the impact of innovation activities on the current valuation of firms at the stock market was developed. Based on this, the relation between current valuation and future performance of firms was investigated. To estimate the prediction precision contained in current company valuations at the stock market, a mathematical model for the total return and its expected statistics was derived and the expected distributions were calculated using Monte-Carlo simulation.

Findings: Intensity of innovation positively correlates to stock market valuation of companies while stock market valuation correlates negatively to future total stock market return. The approximate return on investment for stocks was 9% while the standard error margin of overall return was 25 % of the investment at the beginning of each year. There is no consistent relation between innovation intensity and long-term stock market returns.

Research/practical implications: While current R&D intensity has a positive impact on current corporate valuation the findings implicate that for the chemical industry the stock market does not reliably predict future profits of individual companies. Furthermore, this eradicates any reason to consider current market values of such companies as reasonable projection for future long-term profits from current early-stage innovation activities.

Originality/value: The presented study questions the predictive power of stock markets, thereby cautioning scientists as well as investors against overestimating the value of models based on such data. Furthermore, the results of this empirical investigation might serve as impulse to question the predictive power of other idealized current models.

Keywords: innovation, rationality of stock market, market based firm performance, chemical industry, stock price modelling

JEL Codes: O16, M2, M1

Introduction

The sources of firm performance comprise one of the oldest riddles of economics since Adam Smith. While innovation has been considered an important factor for firm performance from the very beginning, there is an ongoing discussion about proper indicators for both innovation activities and firm performance (Dziallas & Blind, 2019). Furthermore, while in some market segments innovation might be considered to be of intrinsic value, in other markets it is simply a means to an end to increase profits compared to the alternative of not innovating.

This study focusses on innovation from an investor perspective and a stock market investor perspective at that, thereby considering profitability to be the key aspect of firm performance for such investors. The perceived importance of innovation for corporate stock market performance in the investigated maket segment is pointed out by the fact, that nearly all companies cover the topic of innovation in their annual reports and many companies even assign a separate section to research and development or technical innovation activities.

Investigations on the general relation between innovation and corporate success often revolved around productivity using accounting figures. Profitability was investigated using accounting figures, survey data, and stock market data (Bockova & Zizlavsky, 2016; Yeh, Chu, Sher, & Chiu, 2010). While accounting figures represent past firm performance, the stock market value of the firm can be seen as error-ridden measure of the expected discounted value of the firms future profits in term of net cash flows (Griliches, 1981; Srinivasan, Pauwels, Silva-Risso, & Hanssens, 2009). In consequence, profits from innovation activies will be delayed in accounting based models while impact will be more or less simultaneous to publication of such activities in stock-market based models.

Still, current studies on the relation between stock market performance and innovation are rather fragmented and there is no good model yet predicting future long-term stock market performance and far less a good model describing the impact of innovation activities on long-term stock market performance of firms. The overall goal of the current investigation is to enrich the knowledge on performance in a stock market environment in the context of long-term innovation models.

1.   Theoretical background and research approach

Various studies investigated the impact of innovation on stock prices. Pakes (1985) found that sudden changes in number of patents and in R&D are associated with sizeable changes in market value of the respective firm, however, significantly varying between firms for a given increase in number of patents. Long-term share price development investigation of the tyre

industry by Jovanovic and MacDonald (1994) lead to the conclusion that due to investors anticipation of future market developments the average stock price for non-innovating firms in an industry falls just before a disruptive innovation causes a drop in present product price. McCutchen and Swamidass (1996) found different impact of R&D cost on market capitalisation of biotech firms in the US depending on company size. Following Schumpeter's concept of innovation, a similar link between stock prices and innovation activities in the IT industry was reported by Greenwood and Jovanovic (1999) based on a model where innovation causes new capital to destroy old capital. Bae and Kim (2003) reported a positive correlation between R&D intensity and market to book value, although with varying strength depending on company origin. In agreement with that Connolly and Hirschey (2005) reported a significant positive impact of R&D intensity on Tobin's q in manufacturing globally, while Lin, Lee, and Hung (2006) could not find such a relationship in a sample of US technology firms. Furthermore, Swift (2014) reported variability in a firm's R&D expenses to have a positive impact on share prices, concluding that variability of R&D expenses is perceived as indicator of effective innovation management by investors.

In general, the majority of current empirical evidence from the literature supports a positive impact of successful innovation on the respective firm's profits and growth and in consequence stock prices. However, there is a significant body of literature not supporting such a clear association between innovation activities and firm performance (Bockova & Zizlavsky, 2016) and only very few studies on large companies within a single industry.

Furthermore, the assumption of stock market value representing a good measure for future firm performance requires not only rational behaviour of stock market participants but also predictive precision regarding future firm performance to base present investment decisions on these predictions. Furthermore, from an empirical point of view, it is very difficult if not impossible to strictly differentiate between non-rational behaviour and prognostic error leading to unsuccessful investment decisions. However, whether this prognostic error is caused by lack of information or faulty processing of information available is not relevant for the overall problem of the current investigation.

Rationality of stock markets and predictive power of individuals in the stock market has been questioned many times before (e.g. Kahneman, 2011, p. 212-216). Furthermore, even forecasting of fundamental economic indicators is still an unresolved problem (Silver, 2013, pp. 179-203). The underlying issues of forecasting are insufficient, unprecise and noisy input data, lack of proven relations (unlike in e.g natural sciences) and nonlinear behaviour, making forecasting in the context of innovation models very intricate. The resulting prediction

precision of innovation models depends on time horizon and specific success rate of innovation activities, both of which vary considerably between industries.

To test the overall prognostic value of stock-market based innovation models, in a first step a descriptive model for corporate value is outlined. In a second step the predictive precision of the model is tested using simple correlation between corporate valuation and stock-market based profitability of the respective company in subsequent timeframes. Finally, to estimate the predictive power of stock market valuations, a simple model is used describing the statistical distributions of total stock market return from an investment at a certain point in time over following annual timeframes.

The first two steps of the overall investigation are taken by testing three hypotheses from past literature:

H1: There is a positive impact of innovation activities on corporate value.

H2: Current corporate market valuation at the stock market adequately mirrors future profits.

H3: There is a significant impact of current R&D intensity on future total stock market return.

One of the research-intensive industries with long innovation cycles and low success rates is the chemical industry (see Miremadi et al., 2013). It is therefore used as a model industry here to investigate impact of innovation on corporate valuation as well as limitations of the long-term predictive power of stock markets. Furthermore, the chemical industry has the additional benefit of being characterized by business to business relationships and in consequence being only indirectly influenced by e.g. fashion changes etc. In addition to that, it is an industry with a rather stable technological environment over the timeframe investigated, thereby eliminating large technological disturbances in the industry itself. Moreover, most of the large companies in the chemical industry are listed on stock markets providing a good industry cross section.

2. Method and empirirical data

To test hypothesis H1 the influence of innovation activities on stock-market based company valuation for the chemical industry (not including refinery and pharmaceutical industry) is tested based on the model of Connolly and Hirschey (2005). Market to book value and Tobin's q, two widely used indicators for expected future cash flow, serve as dependent variables representing corporate market valuation. The same model is tested for predicting future total stock market returns from the respective firms and correlations between all dependent variables considered is tested.

In a second step, the predictive precision of a company's stock market value itself is investigated to estimate the relative magnitude of disturbances to be expected. Therefore, a basic model for rational pricing of company shares based on total return of an investment in the respective stocks is developed. The basic model is not considered to mirror real market conditions but to be used instrumentally in estimating predictive power of forecasts on future returns in the stock market. Assuming risk neutrality the model predicts a more or less narrow distribution of return rates around a common market interest rate. Fitting of the distribution to real stock market data allows a fair estimation of the predictive power of the stock market.

2.1 Data, basic model and descriptive statistics

As basis for all empirical testing, stock market data of stocks of 123 major companies in the chemical industry (without petrochemicals and pharma) were extracted from Refinitiv Eikon for financial years 1983-2018. Data for the gross world product were extracted from the database of the World Bank using indicator code NY.GDP.MKTP.CD (World Bank, 2020). Summary data of the panel including basic descriptive statistics are presented in Table 1. The companies are multinational companies originating from democracies all over the world (EU and rest of Western Europe: 37; North America: 35, Japan: 24; Rest of the world: 24). The resulting panel is unbalanced due to different availability of stock market data.

R&D intensity $I_{R\&D}$ defined as R&D expenses divided by net sales tends to be relatively high in the chemical industry, even not counting the pharmaceutical sector. The variable is the most common indicator for the technical innovation extent of a company and is used here as independent variable for innovation activities.

Tobin's q is approximated by market capitalisation plus total debt divided by the book value of total assets (Chung and Pruitt, 1994). Market to book value of a company is calculated by market capitalisation divided by total equity (Bae and Kim, 2003).

To investigate actual asset performance on the stock market the total return index of a stock over a certain period of time is used, starting with the first interval $t = 1$ and ending at $t = n$ and based on US dollars as common currency. The total return CR for an investment Q is defined here as total price of the assets from the investment at the end of a specified period incorporating price changes and dividends and assuming direct reinvestment of dividends. The total return index I_{CR} used for this investigation to make firm stock performance directly comparable is given by:

$$[I_{CR}]_{t=1}^n = \frac{\prod_{t=1}^n CR_t}{\prod_{t=1}^n Q_t} = \prod_{t=1}^n (I_{CR})_t$$

$$\text{with} \quad I_{CR} \geq 0, \quad CR \geq 0, \quad Q > 0 \ .$$

For total loss of the investment the total return index becomes zero. For the purpose of this study the total return index provided (TR.TotalReturn) by Eikon was transformed into the form from above and converted to US dollars.

Following Connolly and Hirschey (2005) R&D intensity, profitability, corporate growth and financial leverage are employed as independent variables. Advertising expenses were eliminated from the original model since they are only declared separately for very few companies in the sample. Corporate size is used as control variable and dummy variables for corporate regions are included in the model.

Profitability is measured here as a firm's net profit margin PM_{net}. It seems reasonable to expect some correlation of past net profit margins to future profitability and therefore corporate valuation. Corporate growth (SG_{avg3y}) is measured as the compound annual growth rate of sales measured over the last three years. While growth affects future returns of the firm, valuation of a company at the stock market might be influenced by the financial risk structure. Financial leverage LV_{fin} is used as respective indicator, defined here as total debt divided by total assets. Another variable often considered critical to success is corporate size. In the current model it is measured in parts per million of the fractions of net sales divided by gross world product of the respective year in current US dollars (CS_{GWP}).

Tab. 1: Summary panel data and descriptive statistics

Indicator	Mean	Std. Deviation	Min	Max	Observations
Sample size by year	67.49	41.25	12	121	2532
Market capitalisation (2015) [USD billion]	10.23	16.61	0.45	104.65	119
Net sales (2015) [USD billion]	8.19	10.74	0.89	78.15	118
Net profit margin [%]	5.83	7.56	-53.88	167.06	2530
Sales growth (3y) [%]	6.20	15.85	-22.97	223.86	2165
Financial leverage	0.59	0.15	0.04	1.25	2526
Corporate size [ppm global GDP]	146.1	226.9	5.1	3040.7	2506
R&D intensity [%]	3.02	2.47	0	17.36	1604
Market to book value	2.26	2.92	-54.43	40.17	2497
Tobin's q	1.16	0.79	0.04	10.15	2497
Total return index for 5 years $(I_{CR})_5$	2.03	2.23	0.14	42.72	1924
Total return index for 10 years $(I_{CR})_{10}$	3.78	5.92	0.10	88.81	1388

Source: Author's calculation using R based on sample data from Refinitiv Eikon.

3.2 Impact of innovation on corporate value and future stock market performance

The general model used for investigating the influence of innovation on corporate valuation can be mathematical described by the formula:

$$DPV = c + b_1\,PM_{net} + b_2\,LV_{fin} + b_3\,SG_{avg3y} + b_4\,CS_{GWP} + b_5\,I_{R\&D} + b_X D_X + \varepsilon$$

The indicators for corporate valution market to book value and Tobin's q as dependent variables DPV represent corporate valuation while the additional dependent variables of total return indices $(I_{CR})_X$ directly mirror future profit at the stock market. Constant c is the intercept of the multiple linear regression and ε is the error term. Coefficients b_1 to b_5 indicate the impact of the respective independent variable on the dependend variable in the model. Dummy variables $D_X = D_6 - D_8$ are used for coding regions Europe, North America and Japan as locations of corporate headquarters. Results of the regression are shown in Table 2.

Tab. 2: R&D and its effect on firm valutaion and stock market profitability

	Estimated coefficients dependent variables			
	Market to book value	Tobin's q	Total return index for 5 years $(I_{CR})_5$	Total return index for 10 years $(I_{CR})_{10}$
Net profit margin	7.000*** (0.987)	3.088*** (0.229)	-3.620** (1.107)	-7.268* (3.293)
Financial leverage	2.202*** (0.457)	-0.371*** 0.106)	0.597 (0.450)	0.517 (1.357)
Rel. sales growth (3y)	-0.148 (0.432)	0.121 (0.100)	-0.447 (0.441)	-3.182** (1.176)
Coporate size	-225.2 (260.3)	-157.9** (60.52)	-560.1* (243.1)	-1,475.4* (681.8)
R&D intensity	8.512** (2.791)	4.447*** (0.649)	-1.655 (2.953)	-7.005 (9.744)
Constant	0.038 (0.322)	0.928*** (0.075)	2.821*** (0.336)	6.806*** (1.039)
EU and Western Europe	0.248 (0.230)	0.139** (0.053)	-0.499* (0.235)	-1.235 (0.742)
North America	0.972*** (0.223)	0.315*** (0.052)	-0.869*** (0.223)	-2.629*** (0.679)
Japan	-0.368 (0.209)	-0.097* (0.048)	-1.356*** (0.209)	-4.342*** (0.639)
F value	26.58	66.91	9.196	9.149
R^2	0.1262	0.2712	0.0581	0.0840
N observations	1417	1417	1063	711

Notes: Standard errors in parenthesis; *** statistical significance at the 0.1 % level; ** statistical significance at 1% level; * statistical significance at 5% level.

Source: Author's calculation using R based on sample data from Refinitiv Eikon.

To evaluate the reliabilty of the current stock market valuation as basis for future profitability, correlations between the respective dependent varibales were investigated (Table 3).

Tab. 3: Relation between current firm valutaion and future stock market profitability

Current stock market valuation variables	Future stock market profitability	
	$(I_{CR})_5$	$(I_{CR})_{10}$
Market to book value	r = -0.158**	r = -0.113**
Tobin's q	r = -0.139**	r = -0.124**
N observations	1891	1356

Notes: ** Statistical significance at the 1% level (one-tail test).
Source: Author's calculation using R based on sample data from Refinitiv Eikon'.

2.2 Predictive precision model calculation and empirical fit

While above calculations mainly served to investigate the impact of innovation on stock market performance and the prediction precision of the underlying models, the question of the predictive power of the stock market itself has not been addressed yet. To evaluate this predictive power a simple model is developed in the following.

When choosing between different investment options on the stock market, rationality requires a positive association between the willingness to pay for an asset and the expected future income from that asset. However, even if investors act on average rationally on basis of the available information, it still does not answer the question, whether there is a statistically significant relation between their expectations and the realized future income stream.

The general very basic model discussed in the following is based on several assumptions broadly recognised as prerequisites for rational stock market behaviour.

1. Investors display risk neutral behaviour.
2. Transaction costs are not significant for long-term investments.
3. Agents on the stock markets consider investment options available globally.
4. Main investment target at the stock markets is financial profit. Financial profit considers dividends as well as stock price development.
5. Different preferences might exist regarding the sequence of future income but in a sufficiently functioning market with interchangeable assets these can be neglected.
6. The model does not consider taxes and transactions costs like exchange fees etc.

Asset performance in this context is given by the total return index I_{CR} defined above. Under rational market behaviour with the above assumptions, the expected value of the total return index should be the same for all shares. If the expected return index for a certain asset is higher, investors in our model would buy the asset which would lead to increasing prices until the expected return is at market level and vice versa for lower expected return indices.

In consequence, in the assumed very basic model only the prediction errors of future returns caused by not anticipated (random) influences must be considered. Since $I_{CR} \geq 0$, and each $(I_{CR})_t$ for $t > 1$ is a statistical realisation of a multiplicative product, we assume

log-normal distribution for I_{CR} . Average total return on the stock market and error margin are the only input variables, leading to a model sufficient for testing against distributions of actual stock market returns and thereby capable of estimating the prediction power of current corporate valuation for future stock market performance.

The model was used to calculate distributions for different timelines and prediction precisions. All calculations were performed using R (R [Computer Software], 2020). Monte-Carlo simulation (1 million runs) of the respective function was employed to calculate all model distributions. The model prediction was fitted to the empirical total return distributions by varying average total return per year and deviation parameters. The results for total returns in one and ten years at 25% devation and an average return rate of 9% are shown in Figure 1.

Fig. 1: Simulated and empirical total return from stock of the chemical industry
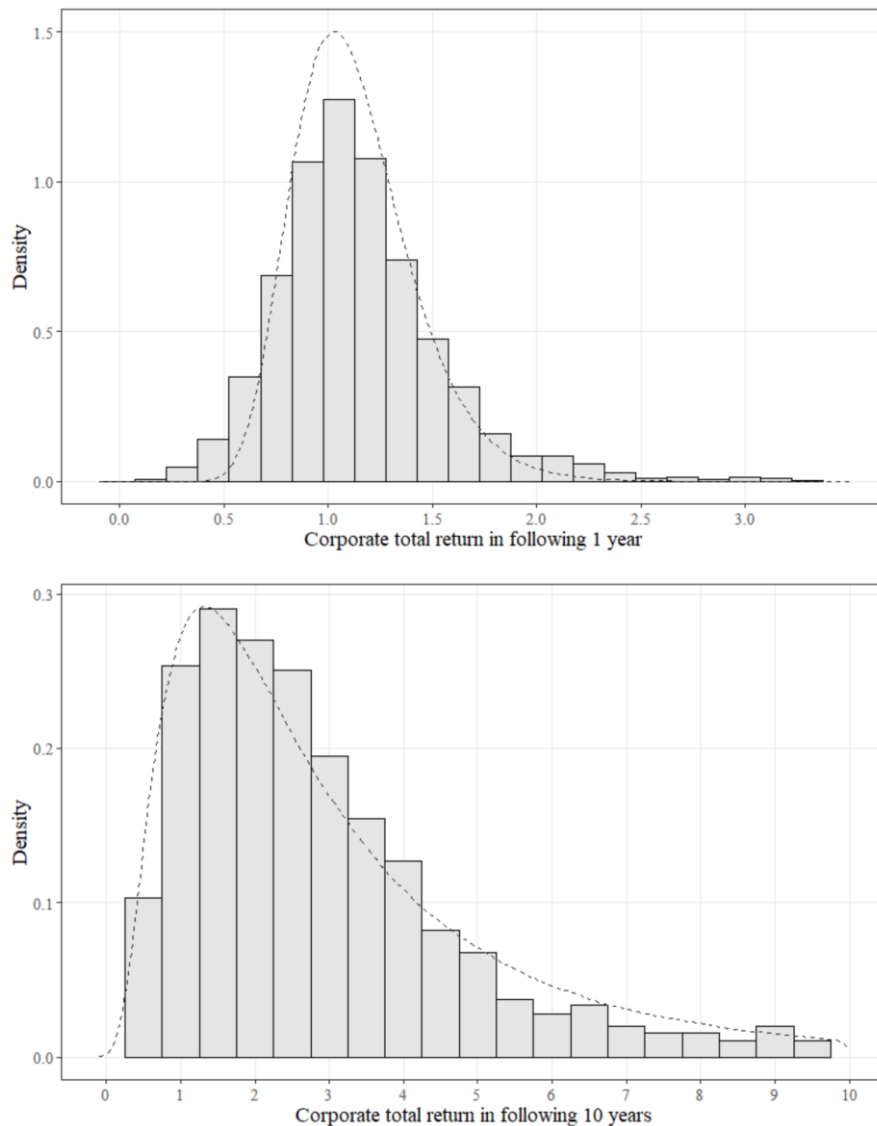
Notes: Histogram of empirical total return of companies for one year and ten years. The simulated distribution is indicated by the dotted line.

Source: R, author's elaboration of the data from Refinitiv Eikon.

3.   Results and discussion

A significant correlation between current R&D intensity and current market value of companies could be established. In consequence, hypothesis H1 was confirmed by statistic evidence. However, the linear models employed can only explain a small portion of the overall market valuation represented by indicators market to book value and Tobin's q (12.6 and 27.1 per cent respectively). The negative influence of financial leverage reported by Connolly and Herschey (2005) was found for Tobin's q while for the market to book value a positive effect existed. Significant negative correlation of corporate size to Tobin's q and future total return exists, suggesting that very large companies have – in view of stock market participants – exeeded their optimim size and are expected to grow slower. Corporate growth is not significantly correlated in the model except for the total ten year stock market return, which appears to be a random effect. There exist significant differences between regions of corporate origin, potentially originating from different regional focus markets addressed by the companies and probably also from different perception of the stock market participants in the individual regions.

The question, whether current corporate market valuation adequately mirrors future corporate profits is more difficult to answer. When testing the relation between the market to book value and future total returns a significant negative correlation was found, indicating that – in agreement with Tobin's theory – firms with high market to book value are overvalued in the chemicals industry. The good fit of the distribution calculated on the simple stock market for 25% devation at an average return rate of 9% (see Figure 1) suggests that a 25 % error in estimating future returns (including original investment) is a reasonable approximation of the average error made by stockmarket participants when evaluating companies of the chemical industry. In consequence it must be concluded, that current corporate valution does not mirror future profits adequately and hypothesis H2 can be therefore rejected.

Hypothesis H3 claiming a significant influence of R&D expenses on future stock market returns of a company could not be confirmed by the model. However, the existence of such a simple relationship would require not only non-rational but rather contra-rational behaviour of stock market participants by ignoring available current information during investment decisions. Not suprisingly, the hypothesis based on such a prerequisite could not be confirmed. The positive correlation of current R&D intensity to market valuation in connection with the rejection of hypothesis H2 seems to indicate a positive signalling effect of profit margin and R&D intensity. However, considering the small amount of market value explainable by these two indicators and the significant impact of multitudinous disturbances amounting to

approximately 2.5-fold the average rate of return, it seems not surprising that the prognostic value of such signalling is very limited.

Still, it is necessary to differentiate between accounting based and stock-market profitability. Furthermore, the entire investigation was performed from the perspective of an investor facing the decision, whether to buy a certain stock or not. While such an investor would be interested in undervalued companies with low share prices and high margin for positive development, current shareholders of a company have an interest in high current share prices.

Conclusion

In agreement with prior literature findings e.g. by Connolly and Herschey (2005), innovation activities measured as current R&D intensity are positively correlated to current market valuation, potentially indicating anticipation of future profits from such innovation by investors. However, inline with Tobin and Brainard (1976), long-term future stock market performance was significantly negatively correlated to current market valuation, pointing out the limitations of predictive power of stock market participants. In fact, similar to the results by Shiller (2000) for overall market indices, stock market pricing of chemical companies has no predictive value for future stock-market based firm profitability whatsoever so that it is rational on average to invest in companies with low market to book value to receive higher future returns. Furthermore, contrary to common belief, no direct correlation between current R&D expenses and future stock market performance of the chemical industry could be identified. This is attributed to both, the overwhelming influence of multitudinous other direct and moderating factors as well as to limitation of pedictive power of stock market participants. While the expected average total return (not corrected for inflation) was – historically speaking – comparatively high at 9%, the estimate extent of deviation of 25% of the total return index per year derived from fitting the model to market data suggests a strong skeptisim of the predictive power of the stock market regarding financial impact of long-term decisions in the chemical industry. Still, considering the average duration of innovation processes in the chemical industry of several years, this predictive power would be essential for a solid assessment of current innovation activities by the stock market. Therefore it can be concluded that stock market based models are not suitable to assess in advance the value or long-term profitability of innovation activities in the chemical industry and should not be considered for such purpose.

However, some limitations exist regarding the current investigation providing several challenges for further research. First of all, a more detailed analysis considering the specifics of the chemical industry including e.g. differentiation of inidvidual market segments within the

overall sample might provide additional insights. Addtional important strategic aspects of technical innovation besides its intensity are innovation type, e.g. production process versus product innovation, and the innovation direction. Both aspects were not covered in the current publication and have significant impact on access to future markets and future firm profitability. However, these aspects are based on decisions under uncertainty. Therefore, while there are multiple examples for more direct short-term effects of innovation activities on the stock market in other industries, it might be worthwile to look at even longer timeframes for the chemical industry. A more historical perspective comparing different general technological as well as stock market developments might add valuable insights. In addition to that, current results regarding long-term prognostic quality might not be valid for other industries, since income predictions for e.g. drugs after successful clinical trials might be more reliable than for chemical technologies opening another field for interesting research. The results are limited to listed companies and situations of stockholders with access only to publicly available information.

In conclusion, before using market based models for investigating a certain industry it is necessary to establish the predictive power of the stockmarket valuation regarding future performance of the respective companies in the industry in question. Future research should consider technical innovation processes as not only including risk but also uncertainty. Risk in this context concerns cost of failure of current innovation projects while uncertainty affects opportunity cost of current innovation projects. While mathematical models are well suited to access risks, uncertainty is an entirely different issue requiring far more detailed industry insight. Furthermore, a more probabilistic approach than used in past research seems to be more promising for forecasting innovation success.

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BANKRUPTCY MODELS: ARE FAMILY FIRMS MORE LIKELY TO BE IN THE "SAFE ZONE"?

Nikola Rosecká – Ondřej Machek

Abstract

Purpose: The goal of the paper is to find out whether family firms have a lower probability of going into bankruptcy than non-family firms.

Design/methodology/approach: We use the Altman model and Kralicek's Quick test to evaluate the probability of going bankrupt. Pearson correlations, Student's t-test and linear regression analysis are used to test the differences between family and non-family firms. The research sample is based on 265 Czech firms: 108 non-family businesses and 157 family businesses. Cross-sectional financial data from 2017 are used in the analysis.

Findings: We did not find any statistically significant differences in bankruptcy models' scores between family and non-family firms.

Research/practical implications: Under favourable economic conditions, the differences between family and non-family firms are not reflected in their probability of going into bankruptcy. More generally, family firms seem not to be more financially stable than non-family firms.

Originality/value: To the best of our knowledge, no study investigated the differences in bankruptcy models' scores between privately held family and non-family firms.

Keywords: family business, bankruptcy prediction models, Czech Republic

JEL Codes: M10, M20

Introduction

In recent years, family businesses have been increasingly receiving academic attention. Family ownership is one of the most common forms of business organisations. At the same time, the number of family businesses that survive the handover of the company to the next generation is surprisingly low. According to Kellermanns and Eddleston (2004), only 30% of family firms manage to survive into the second generation, and only 15% to the third generation. Timely identification of potential financial distress and the financial factors causing this distress might help increase the survival rate of family firms.

This study aims to find whether family firms are more likely to be in the "safe zone" and have a lower probability of going into bankruptcy than non-family firms. For evaluating our research question, we use bankruptcy prediction models' scores, specifically the Altman model and Quick test. The research sample consists of 265 Czech firms: 108 non-family businesses and 157 family business based on financial data from 2017.

The remainder of this paper proceeds in the following manner. First, we present the relevant theoretical background. Then, we describe the data and methods used in our study. Subsequently, results and discussion are presented. Finally, we provide concluding remarks.

1.   Theoretical background

The family business literature does not offer a universal definition of the term "family firm". While the literature offers a wide range of possible definitions, it distinguishes two main groups of definitional criteria (Chrisman et al., 2005; Chrisman et al., 2012; De Massis et al. 2012): the "involvement criteria" (i.e. the family's involvement into management and ownership) and the "essence criteria" (i.e. behavioral traits, such as the existence of transgenerational transfer intentions, or self-identification as a family firm).

The existence of family involvement, together with the existence of family essence, has been shown to imply the pursuit of family-centred non-economic goals (Chrisman et al., 2012), which are unique to family firms and differentiates them from their non-family counterparts. The different behaviour of family firms has frequently been conceptualised using the theory of socioemotional wealth (SEW). According to the SEW approach, family firms are committed to the preservation of their socioemotional wealth instead of following strictly economic goals. In so doing, family firms may seek to protect, among others, the binding social ties, the renewal of family bonds through dynastic succession, or the identification of family members with the firm (Berrone et al., 2012).

The family business literature often describes family firms as risk-averse (Hiebl, 2013). This is because the damage of family reputation or threat of losing family control over the firm (Kachaner et al., 2012; McConaughy et al., 2001) directly results in the loss of socioemotional wealth. Since family firms are more preoccupied with non-economic goals, they are often also considered to be a stable organisational form, especially by the broad public. For instance, the Association of Small and Medium-Sized Enterprises and Crafts of the Czech Republic (AMSP, 2016) refers to family firms as "self-confident, credible and stable". According to Christine Blondel, an adjunct professor at the Wendel International Centre for Family Enterprise at INSEAD, "family firms are much more stable and perform better" (Knowledge@Wharton, 2016). Consistently with this popular belief of superior stability of family businesses, multiple meta-analyses showed that family firms outperformed non-family firms. For instance, Wagner et al. (2015) found evidence of a weak, yet statistically significant superior performance of family firms. The meta-analysis of Van Essen et al. (2015) found comparable results; however, the performance of family firms seemed to deteriorate after the transfer of family control to the next generation.

However, the idea that family firms perform better has been challenged by several authors (e.g. Villalonga and Amit, 2006). The same applies to the superior stability of family firms. According to Machek and Pokorný (2016), there are no significant differences in family and non-family firms when it comes to the number of insolvency proceedings or bankruptcies. Similar results have also been presented by Machek et al. (2019), according to whom family firms enjoy better employment stability, but mainly in times of economic crises, when the socioemotional wealth is put at danger. While family businesses may be more stable due to the existence of family ties, they are also endangered by the existence of conflicts by which they are challenged more than any other organisational form (Kellermanns and Eddleston, 2007). As a result, while family entrepreneurship may be associated with advantages such as increased trust or shared vision (Mani and Lakhal, 2015), these may become offset by relationship conflicts and harm the stability of family firms. The comparative performance of family firms and its determinants are still an open area of research.

Timely identification of potential distress might reduce the risk of failure and increase the number of family firms which manage to survive into the second or third generation. Consequently, in this paper, we investigate whether the probability that family firms may go into bankruptcy differs from non-family firms. The academic literature offers multiple methods of bankruptcy prediction (also known as bankruptcy models), such as the Altman model (1968), Kralicek's Quick test (Kralicek, 1991), or the Taffler model (Taftler and Tisshaw, 1977). Since

they proved to have a reasonably efficient predictive ability in the Czech environment (Machek, 2014), we employ them to address the following research question: are family firms more likely to be in the "safe zone", and thus have a lower probability of going into bankruptcy than non-family firms?

2.   Data and methods

The identification of family and non-family firms was based on a phone survey carried out between 2018 and 2019 by a French firm specialized in market research. The survey was conducted among randomly selected firms with multiple owners having more than ten employees. The full list of such firms (i.e., the population) was extracted from the Bureau van Dijk's Amadeus database. For a detailed description of the survey, see Hnilica et al. (2020). In our study, firms which would describe themselves as "family businesses" were considered to be family firms, while the other firms were considered to be non-family firms. Hence, in our research, we used the family essence definitional criterion; specifically, the criterion of self-identification as a family firm (Chrisman et al., 2005). Thus, we follow Chrisman et al.'s (2012) view that the mere existence of family ties does not guarantee the pursuit of family-centered specific goals; a firm also needs to have "family essence" in order to be defined as a family firm.

To get financial data, we imported the list of national identification numbers (IČ) of family and non-family firms from the previous step to the Bisnode's Albertina database. We used cross-sectional data from the most recent available year (2017). Overall, the research sample consists of 265 firms: 108 non-family businesses and 157 family business, for which the financial data were available in the database. To test differences between family and non-family firms, we employed the Student's t-test for mean differences and linear regression analysis.

Our primary dependent variables include the classical bankruptcy prediction models' scores. Specifically, we used the *Altman model* (Altman, 1968) and Kralicek's *Quick test* (Kralicek, 1991) to evaluate the probability of financial distress. In the Altman model, the Z score is calculated as a linear combination of five financial ratios (T_1 = net working capital over assets, T_2 = retained earnings over assets, T_3 = earnings before interest and taxes over assets, T_4 = equity over liabilities, T_5 = sales over assets) according to the following formula:

$$Z = 0.717T_1 + 0.847T_2 + 3.107T_3 + 0.420T_4 + 0.998T_5 \qquad (1)$$

A score higher than 2.9 indicates that a firm is safe from bankruptcy. On the other hand, a score lower than 1.2 indicates a significant risk of going into bankruptcy. Kralicek's Quick

test value was extracted directly from the Albertina database. The values range from 1 (very weak company position) to 5 (very good company position).

The leading independent variable is *family firm* which is a dummy variable taking the value of one if the case is a family business, and zero otherwise. Our analysis controls for *firm size* (measured as the natural logarithm of total assets) and *firm age* (2017 minus the year of incorporation). Since the market conditions are likely to vary across sectors, we also control for three most represented *industry sectors* as identified by the four-digit NACE codes: C. Manufacturing (111 cases), F. Construction (35 cases), and G. Wholesale and retail trade; repair of motor vehicles and motorcycles (39 cases). As the other NACE sections were represented only marginally, we did not include them among the model variables.

3.   Results and discussion

All statistical analyses were performed in IBM SPSS Statistics 23. Table 1 provides descriptive statistics for all variables. The youngest firm in the sample is one year old, while the oldest one has 28 years; the mean firm age is about 19 years. There are 59% of family firms in the sample. The Quick test score ranges from 1 to 5, while the Altman score ranges from –21.722 to 9.024. The minimum value is due to the fact that the company had negative earnings before interest and taxes which has significant impact on reached Altman score. Simultaneously the company had negative short-term liabilities. However, because the observation is real and not erroneous, we do not exclude it from the analysis.

Tab. 1: Descriptive statistics

Variable	Minimum	Maximum	*M*	*SD*
Firm size	5.333	14.397	9.860	1.327
Firm age	1	28	18.73	7.540
Family firm	0	1	0.59	0.492
Altman model	–21.722	9.024	1.004	1.888
Quick test	1	5	2.9943	1.009

Source: Authors (2019).

Table 2 presents the bivariate Pearson correlations among the model variables. Firm size is negatively correlated with firm age, and there is a negative and significant correlation between size and Quick test. That means, the larger the size of the business, the worst value of Quick test. There is also a negative and significant correlation between the Altman score and Quick test. This was expected, as firms with a better result in the Altman model are more likely to get a worse value in Quick test.

Tab. 2: Correlation matrix (N=265)

	Firm size	Firm age	Family firm	Altman model	Quick test
Firm size	1				
Firm age	0.512**	1			
Family firm	–0.049	–0.042	1		
Altman model	0.046	–0.006	–0.047	1	
Quick test	–0.195**	–0.069	–0.007	–0.289**	1

Note: **- Correlation is significant at the 0.01 level (2-tailed).
Source: Authors (2019).

Table 3 displays the results of the Student's t-test for mean differences with unequal variances for both the Altman score and the Quick tests score. The test shows no significant differences between family and non-family firms.

Tab. 3: Test for mean differences between family and non-family firms (N=265)

Variable	Mean		Difference in means	t	p
	Family firms	**Non-family firms**			
Altman model	0.930	1.109	0.179	0.775	0.451
Quick test	2.989	3.002	0.013	0.106	0.915

Source: Authors (2019).

Table 4 provides the regression results for two models, in which the dependent variable is the Altman score, or the Quick test, respectively. In both models, no statistically significant effects on family control have been found. The firm size seems to negatively affect the Quick test score, which is consistent with the pairwise correlations (Table 2). Firm age seems to be unrelated to both bankruptcy prediction models.

Tab. 4: Regression results (N=265)

	Model 1: Dependent variable is the Altman model				Model 2: Dependent variable is the Quick test			
Variable	**B**	**SE**	**t**	**p**	**B**	**SE**	**t**	**p**
Intercept	0.158	0.933	0.169	0.866	4.663***	0.490	9.524	< 0.001
Firm size	0.136	0.107	1.272	0.205	–0.188***	0.056	–3.343	0.001
Firm age	–0.006	0.018	–0.325	0.745	0.003	0.010	0.283	0.778
Family firm	–0.115	0.240	–0.479	0.632	–0.069	0.126	–0.550	0.583

Note: *** - Significant at 0.01. In addition to the above explanatory variables, regressions include three dummy variables, each of which represents an industry sector (NACE sections C, F, and G).
Source: Authors (2019).

Overall, the results do not suggest the existence of differences between family and non-family firms in terms of bankruptcy prediction models' scores. This finding is consistent with Machek and Pokorný (2016), who investigated the number of insolvency proceedings and found no significant differences between family and non-family businesses. Based on the results, we may hypothesize that during stable economic conditions, family firms seem to enjoy the same positive economic development as their non-family counterparts and follow similar management policies; consequently, the differences in terms of the probability of going out of the market are mitigated. This idea is in line with the paper of Machek et al. (2019) who found comparable findings in another sample, and hence, we provide further evidence for their results.

Another factor which may have offset the stability-related advantages of family firms (such as long-term orientation or transgenerational intentions) may be intrafamily relationship conflicts. Conflicts in family firms can be associated with high costs because family members are "locked" in family businesses (Benavides-Velasco et al., 2013) as they cannot simply leave the firm and family when deep disagreements occur. Conflicts have the potential to harm the performance of family businesses (Eddleston and Kellermanns, 2007; Nosé et al., 2017) and the existence of conflicts may be one of the reasons why family firms were not found to be stable despite their commitment to long-term survival.

In the popular press, but also in the academic literature, family firms are often presented as stable organizational forms. Our findings suggest that the superior stability of family firms is, at least, debatable. However, even though we did not find any significant differences in bankruptcy model scores between family and non-family firms, we would like to emphasize the need for further understanding the financial specifics and needs of family firms. Understanding and supporting family businesses might help reduce the number of family firm failures related to succession issues (Kellermanns and Eddleston, 2004). However, in current public grants, there seem to be no predominant actions to directly support family firms (Dvouletý et al., 2020).

Conclusion

Family business is still a developing research area, and that is why the number of research papers has been growing rapidly in the last years. Our research aimed to examine if family businesses enjoy better scores in bankruptcy prediction models. Overall, the results did not reveal any significant differences between family and non-family firms.

According to some authors, family businesses are more stable than non-family firms during economic crises. We cannot verify this hypothesis because we did not have access to

longitudinal data which would contain one or more complete economic cycles. This is also the main limitation of our research. Another limitation is related to the composition of the research sample: our analysis used Czech private firms with more than ten employees only. However, it seems that most previous studies on bankruptcy predictions models focused on a single country or industry (Alaminos et al., 2016).

Further research could focus on performing a similar analysis on a more extensive data set, not only in terms of the number of firms but also in terms of multiple observations across time. Another promising area of research could be to investigate other determinants of bankruptcy or performance (e.g. Coad and Shroi, 2019). The two bankruptcy prediction models we used in our analysis are based on financial data. Financial econometric variables for bankruptcy prediction seem to prevail in the literature (Alaminos et al., 2016). The recent entrepreneurship literature, however, offers non-traditional factors which reduce firm growth and may also act as factors that increase the risk of bankruptcy. Coad and Srhoj (2019), for instance, suggest that such factors may include raw materials, supplies, inventories, reserves, or amortization.

As opposed to the traditional bankruptcy models, an analysis of non-economic predictors could unveil much more about the true differences between family and non-family firms and test our proposition that in a positive economic development, the advantages of family control over the firm are mitigated by its disadvantages (such as by the existence of intrafamily conflicts, but also by other, yet unknown factors). Also, for family firms, future research could establish the link between various predictors of failure in the context of succession (Giménez and Novo, 2019). For such an analysis, unique family-level variables (such as the successor's willingness to continue in the firm) would need to be taken into account. Finally, there are other and more recent methods of bankruptcy prediction, such as neural networks, logit models, support vector machines, or decision trees, which could also provide interesting findings. On the other hand, as noted by Alaminos et al. (2016), more modern methods do not always guarantee the most accurate results.

Acknowledgement

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DOES THE NUMBER OF OWNERS MATTER IN FINANCIAL PERFORMANCE OF FAMILY AND NON-FAMILY FIRMS?

Michele Stasa – Ondrej Machek

Abstract

Purpose: The goal of this paper is to explore the relationship between number of owners and financial performance of family and nonfamily firms.

Design/methodology/approach: The research sample contains 245 privately held Czech firms, out of which 58% are family businesses. We used financial data from the year 2017 extracted from the Albertina database. Financial performance was measured by return on assets, current ratio, assets turnover and debt-to-equity ratio. Correlation and multiple linear regression analyses were conducted.

Findings: The results suggest that the number of owners of family firms is associated with higher return on assets and thus profitability, whereas no effects have been found in the sample of non-family firms. The number of owners seems to have no effects on liquidity, debt use and asset management.

Research/practical implications: Larger size of the owning group may be beneficial to family firm performance. In non-family firms, it does not seem to affect firm performance.

Originality/value: We contribute to the knowledge on the role of owning groups in performance of privately held firms.

Keywords: ownership concentration, number of owners, family firms, family business, financial performance, Czech Republic

JEL Codes: M10, M12

Introduction

The corporate governance literature was long focused on the relationships among owners and managers in listed firms (Aguilera et al., 2016). However, most firms worldwide are privately held, and they do not have any board of directors, or have it merely to meet the legal obligations (Uhlaner, 2008). In such firms, the owners become the key persons affecting the strategy of the firm. While business-owning groups are a worldwide phenomenon (Uhlaner, 2008), they are not well understood. On the one hand, the presence of many owners may lead to agency costs. On the other hand, groups of people may be able to perform better than unrelated individuals (Schultze et al., 2012), and this idea may be generalized to business-owning groups, especially when there are family ties among owners (Uhlaner et al., 2015).

This paper aims to test the effect of the number of owners on the financial performance of private firms while considering the (non)existence of family ties in the firm. We do not have any *ex ante* assumptions and use an exploratory approach. To address the goal of the paper, we test the effect of number of owners on the key financial characteristics: profitability, liquidity, asset turnover, and level of debt. In the analysis, we also distinguish between family and non-family firms.

The rest of this paper is structured as follows. First, we develop the relevant theoretical background. Second, we present the data and methods. Then, the results are presented and discussed. Finally, we provide concluding remarks.

1.   Theoretical Framework

Our knowledge on the role of the number of owners in firm behavior and performance originates mostly from the analysis of public corporations. For instance, multiple studies found that the number of owners is positively associated with financial disclosure (Cooke, 1992; Malone et al., 1993). Also, Darus et al. (2014) argue that a larger number of shareholders may exert pressures on corporate social responsibility (CSR) reporting. Consistent with the idea, Hu and Scholtens (2014) found that CSR in banks was significantly correlated with the number of shareholders.

The traditional corporate governance theory assumes that in closely held firm with few owners, the interests of firm managers and owners are better aligned (Storey, 1994). When ownership is not dispersed among numerous shareholders, owners are likely to perform active monitoring and reduce the agency costs (Zahra & Pearce, 1989). In firms with dispersed ownership, however, agency conflicts can arise (Ishak & Napier, 2006). Then, a high number of owners may result in free riding, meaning that no owner has incentives to actively control

management. Agency costs associated with a high number of shareholders may have adverse effects on profitability (Lappalainen & Niskanen, 2012) and increase the probability of being an "inactive" company (Amendola et al., 2015).

In previous research, the number of owners has often been used as a proxy for firm size or ownership structure. However, this "instrumental approach" fails to acknowledge that owners are a social group of people who interact with each other (Uhlaner et al., 2007). Consequently, the literature also suggests the existence of positive effects of the number of shareholders. Some authors consider that the number of owners is directly related to capital availability and leads to a more professional management (Fabowale et al., 1995). Thanks to the availability of personal funds of multiple owners, firms with multiple owners may enjoy better innovativeness (Müller & Zimmermann, 2009).

Previous research suggests that teams may outperform unrelated individuals (Cooper & Gimeno-Gascon, 1992) since teams have better predispositions to have access to resources, skills, and networks of contacts (Terjesen & Szerb, 2008). In other words, since owning groups are social groups (Uhlaner et al., 2007), they may be source of bonding (internal) and bridging (external) social capital (Uhlaner et al., 2015).

While the previous research in governance builds on the analysis of listed firms, most companies are privately held (La Porta et al., 1999). Moreover, among private firms, the most prevalent organizational form seems to the family business (Chrisman et al., 2004; Botero et al., 2018). While there is no universally accepted definition of what a "family business" is, the most widely accepted definitions include the family involvement criteria (such as the presence of family members in ownership or management), and the family essence criteria (such as the existence of transgenerational succession intentions) (De Massis et al., 2012).

In family firms, the boundaries between the family and firm are blurred. Unlike other organizational forms, family firms follow a unique set of family-centred goals, sometimes operationalized using the socioemotional wealth (SEW) approach. The key dimensions of SEW include identification of family members with the firm, the existence of binding social ties and emotional attachment to the firm (Berrone et al., 2012). Hence, in can be expected that in family firms, owning groups become a source of collective commitment and social capital. On the other hand, with respect to the scope of our study, an important finding is that family firms tend to have less shareholders than non-family firms (Gallo et al., 2004).

Overall, in previous research, the number of owners has mainly been used as an operationalization of firm size or ownership dispersion, and a source of agency costs. At the same time, the owning group may also become a source of competitive advantage due to its

bonding and bridging social capital. Hence, the effect of the number of owners on the firm may be two-fold. Consequently, this paper aims to address the following research question: How does the number of owners affect the financial performance of private firms?

2.   Materials and Methods

To sample firms, we used a database of family and non-family firms available at the Department of Strategy, University of Economics, Prague. The database was created based on a phone survey among randomly selected Czech private firms with multiple owners, with a response rate of 10.26%. For a detailed description of the sampling procedure, see Hnilica et al. (2019). For the purpose of this paper, we used the national identification numbers (IČ) of firms which responded in the survey to gather financial data from the Bisnode's Albertina database. The research sample consists of 245 firms, which have complete financial data for 2017. In the analysis, we considered a firm to be a family firm when the CEO/owner described the firm as a family business, thus employing the "family essence" definitional criterion (De Massis et al., 2012). As a result, 58% of the sample is represented by family firms, while the remaining 42% are non-family firms.

To describe the sample, descriptive statistics and frequencies were used. Furthermore, correlation analysis was executed. To test the effect of the number of owners on financial performance, eight multiple linear regressions were performed in Stata 14 both for family and non-family firms. The following performance indicators were selected as dependent variables:

- Return on assets (P/L before taxation over total assets)
- Asset turnover (revenue over total assets)
- Current ratio (current assets over current liabilities)
- Gearing (debt-to-equity ratio)

The regression models include the following independent variables. To take into account the maturity effect on financial ratios, we control for firm age (2017 minus year of incorporation). To capture the scale effects, the size of the firm was employed (as a natural logarithm of total assets). Lastly, to reflect also the industry effects, sixteen industry dummy variables were used (see Table 1).

3.   Results and Discussion

Table 1 shows the industry affiliation of the firms in the sample, for both family and non-family firms. Most firms operate in the NACE sector C ("Manufacturing"), followed by sector G ("Wholesale and retail trade; repair of motor vehicles and motorcycles"), sector F

"Construction") and M ("Professional, scientific and technical activities"). Several industries are only represented marginally (e.g., electricity or water suppliers). Category "other" also contains insignificantly covered industries (such as section P – Education, Q – health and social care, R – cultural, entertainment and recreational activities, and S – other activities). The differences between family and non-family firms are not particularly significant. Family firms are slightly more represented in manufacturing (C), administrative and support activities (N), whereas non-family firms occur often in information and communication sector (J), or in professional, scientific and technical activities (M).

Tab. 1: Industry affiliation of the firms in the sample

	Family firms		Non-family firms	
Industry affiliation	**Absolute frequencies**	**Relative frequencies**	**Absolute frequencies**	**Relative frequencies**
A: Agriculture, forestry and fishing	3	2.1%	6	5.8%
C: Manufacturing	60	42.6%	33	31.7%
D: Electricity, gas, steam and air conditioning supply	0	0.0%	1	1.0%
E: Water supply; sewerage; waste management	0	0.0%	1	1.0%
F: Construction	19	13.5%	14	13.5%
G: Wholesale and retail; repair of motor vehicles/motorcycles	23	16.3%	15	14.4%
H: Transportation and storage	5	3.5%	2	1.9%
I: Accommodation and food service activities	7	5.0%	2	1.9%
J: Information and communication	1	0.7%	6	5.8%
L: Real estate activities	2	1.4%	2	1.9%
M: Professional, scientific and technical activities	8	5.7%	13	12.5%
N: Administrative and support service activities	10	7.1%	5	4.8%
Other	3	2.1%	4	3.8%
Total	**141**	**100.0%**	**104**	**100.0%**

Table 2 shows the descriptive statistics for the whole sample. The maximum and minimum values suggest the presence of influential observations, however in order to capture real data, there were not removed from the sample. The biggest deviation occurs in gearing

ratio, the smallest in assets turnover. Regarding the number of owners, firms in the sample are in average own by 3,21 owners, where 35 owners is maximum value. Firms are rather mature, with mean of 17,88 years. Regarding the financial ratios, average return on assets is 8,8 %; current ratio 5,3; gearing 133,6 and assets turnover 2,1.

Tab. 2: Descriptive statistics

	N	Min	Max	Mean	SD
Owners	245	2	35	3.21	3.13
Age	245	0	27	17.88	7.38
Size	245	0	14.39	9.84	1.46
ROA	190	-36.96	75.66	8.79	14.41
CR	245	0	282.69	5.26	18.88
GE	245	-3463.22	2216.47	133.61	448.80
AT	192	0	14.5	2.1	1.62

Note: Owners = number of owners; Age = firm age; Size = ln(assets); ROA = return on assets; CR = current ratio; GE = gearing; AT = assets turnover.

The matrix of Pearson correlations among variables is shown in Table 3. Several strong pairwise correlations were found. The third column is the most relevant with respect to our goals. There is a significant positive correlation between the number of owners and firm size, whereas a significant negative correlation between the number of owners and debt-to-equity ratio was found (both significant at the 0.05 level). A higher firm age may also be associated with a higher the number of owners due to the involvement of new investors, spouses, family members (including next generations). A strong positive correlation was also found between firm size and firm age, which indicates the business growth through time. Contrary, significant negative correlations are evinced between age and return on assets, age and assets turnover, size and assets turnover, and current ratio and assets turnover. Most of these relationships may indicate ineffective assets usage, larger increase of assets compared to revenues, and as a result decreased current liquidity. The last negative correlation (significant at the 0.1 level) was found between assets turnover and debt-to-equity ratio.

Tab. 3: Correlation matrix

	Age	FB	Owners	Size	ROA	CR	GE	AT
Age	1							
FB	-0.043	1						
Owners	0.141**	-0.054	1					
Size	0.432***	-0.06	0.095	1				
ROA	-0.214***	0.001	0.005	-0.039	1			
CR	-0.055	-0.071	-0.014	-0.001	0.08	1		
GE	0.017	-0.076	-0.126**	0.076	-0.078	-0.04	1	
AT	-0.35***	-0.008	-0.067	-0.404***	0.102	-0.144**	-0.137*	1

Notes: *** - significant at 0.01; ** - significant at 0.05; * - significant at 0.1. N=190 for correlations including ROA; N=192 for correlations including AT; N=245 otherwise. FB = family business; Owners = number of owners; Age = firm age; Size = ln(assets); ROA = return on assets; CR = current ratio; GE = gearing; AT = assets turnover.

Table 4 displays the results of the eight regression models. Regarding the number of owners, the only significant effect was found in the case of return on assets in case of family businesses. However, no significant effect was found within the sample of non-family businesses. Therefore, the number of owners is associated with a higher profitability only in the case of family businesses. When considering other financial rations as the dependent variables (liquidity, gearing, and asset turnover), no statistically significant effects of the number of owners were found, both in the sample of family and non-family firms.

Tab. 4: Regression results

	Family businesses				Non-family businesses			
	ROA	CR	GE	AT	ROA	CR	GE	AT
Owners	0.628*	-0.076	-19.7	0.026	-0.129	0.168	-7.163	-0.065
Size	0.747	0.489	38.94	-0.257**	1.080	-1.007	8.345	-0.385***
Age	-0.094	0.056	6.3	-0.079***	-0.575	-0.62	-8.544	-0.012
Constant	5.128	-1.807	-336.72	6.595***	2.484	22.46	397.816	7.181***
N	110	142	142	111	80	103	103	81
F-test	3.292***	0.993	1.27	4.997***	2.536**	0.774	1.595	6.845***
R^2	0.212	0.057	0.071	0.288	0.215	0.061	0.118	0.422

Note: *** - significant at 0.01; ** - significant at 0.05; * - significant at 0.1. Industry dummies are not displayed. Owners = number of owners; Age = firm age; Size = ln(assets); ROA = return on assets; CR = current ratio; GE = gearing; AT = assets turnover.

Our main finding is that while the involvement of more owners increases profitability in family firms, it does not affect profitability in non-family firms. The finding suggests that family ties may enhance group performance in business-owning groups. When no family ties are present among owners, agency costs may offset possible advantages of collaborative group behavior.

The findings may be explained using the socioemotional wealth approach. In family businesses with multiple owners, the owning group is characterized by the presence of family ties. The social relationships become altruistic and reciprocal, which may reduce agency costs, enhance stewardship, facilitate team cooperation and improve business-owning group performance. What is more, the binding social ties may extend beyond the family group to other people inside or outside the firm (Filser et al., 2018). Consequently, the bridging and bonding social capital of family firms (Uhlaner et al., 2015) and the tacit knowledge of the company (Filser et al., 2018) may increase with the number of owners. The owning group performance may also be enhanced by the emotional attachment and identification of group members with the firm, which are typical for family firms. When the success of the firm is perceived as personal success of the owners as a team, then, despite the fact that more extensive owning groups may increase the potential for agency costs, the emotional attachment and identification of family members with the firm may mitigate these costs and positively affect the family firm performance.

Conclusion

In this paper, we found a significant positive relationship between the number of owners and firm performance in family firms, while no similar effects have been found within the sample on non-family businesses. Our results also suggest that the number of owners does not affect any other financial ratios: current ratio, gearing, and asset turnover. We present a contribution to the management literature which has been relatively silent on the role of owners in privately-held firms.

However, our study is not free of limitations. First, we used a simple definition of family firms based on self-identification. While this approach is widely used in the family business literature (De Massis et al., 2012), it is not the only possible criterion, and it is also possible that some owners would describe their firms as "family businesses" due to the overall atmosphere or relationships rather than to the presence of family ties. Second, it should be noted that only in family firms with good family functionality, the owning group may benefit for a higher number of owners. In firms with dysfunctional family ties, the adverse effects may prevail (Filser et al., 2018). However, our study did not address the question of quality of relationships and family functionality. Last but not least, our sample is composed of Czech privately held

firms. We cannot rule out the possibility that the cultural context shapes the existing relationships among the model variables and in other countries, the results may be different.

The above limitations also outline several possible avenues for future research. Incorporating other variables into the analysis, such as the family functionality or family harmony, might shed more light on the effects of the number of owners. Also, future studies could take into account the heterogeneity among family firms, since the consequences of family involvement are likely to vary across and within family firms (Sharma & Sharma, 2011).

Acknowledgement

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SOCIAL ENTERPRISES IN THE CZECH REPUBLIC: SELECTED ASPECTS

Petra Taušl Procházková – Kristýna Machová

Abstract

Purpose: Main goal of the paper is to contribute to the level of knowledge on the social enterprises´ characteristics in the Czech Republic. Special focus is placed to selected aspects, perception of barriers of social enteprises´ development and selected aspects of management.

Design/methodology/approach: Primary research was done among the sample of Czech social enterprises in 2018 (51 enterprises). Based on a questionnaire distributed during November 2017 and February 2018, we explore the perception of barriers of development, attitude to management tools and satisfaction with fulfilling setting goals. We applied a method of ranking, Saaty approach, odds ratio ("OR") and Yule's Q. We also empirically investigated the association between the satisfaction with fulfilling setting goals and using management tools.

Findings: We confirmed that there is limited scope in data availability of social enterprises. Further, it has been found that respondents' perception of development barriers is linked to internal, but also to external factors. Internal factors are dominant. Further, we agreed that there is a certain association between satisfaction with goals fulfilment and the approach to apply several management tools. We find out that enterprises that use selected tools tend to do better and recommend to apply and explore further these results into future research.

Research/practical implications: Gained data may serve to extend the existing body of knowledge on Czech social enterprises and contribute to improving conditions and supportive framework under which they currently operate. Future research should follow when the aim to collect data with systematic and methodical effort should be taken into account. Thus, it can be enabled to support the development of this sector including appropriate policies, showing its importance and strengthen the position of social enterprises among other ecosystem bodies.

Originality/value: The paper empirically contributes to the current body of knowledge on social enterprises in the Czech Republic. Gained data bring insight into the main so far existing provided surveys, further into the perception of barriers of development and approach to using managerial tools. Thus, it serves to the aim of other scholars to systematically collect data and provide social enterprises themselves, as well as to relevant stakeholders, information helpful for improving the situation in the social entrepreneurship sector.

Keywords: social enterprise, barriers of social entrepreneurship, tools of management

JEL Codes: L31, P31, L26

Introduction

Social entrepreneurship is subject of increasing interest and has been undergoing a significant expansion in recent years. The concept of social entrepreneurship is built on the call to reach the balance within the triple bottom line, i.e. to reach the balance between social, environmental mission together with fulfilling basic economic principles. Even the fact that social entrepreneurship is becoming a phenomenon, the concept is still poorly defined, and its connections to other disciplines, principles and constructs remain fuzzy. The research stream is fragmented and aims to different perspectives. However, this fact should be seen as a great opportunity, not as a limitation, for researchers to deepen the current level of knowledge.

Some scholars concentrate on the theoretical background of social entrepreneurship, some prefer to focus their attention to subjects operating within the social entrepreneurship concept. Thus, there is a large array of interest dedicated to social enterprises and wide spectrum of attributes related with, e.g. management of social enterprise (e.g. Weerawardena and Mort, 2006), personality of social entrepreneurs (e.g. Sharir and Lerner, 2006) or impact and benefits of social enterprises (e,g. Nicholls, 2009).

Another task worth to mention is that the concept of social entrepreneurship and its perspectives may be understood across continents and even more across countries in a different way. There are not only differences in how different perspectives have emerged through the world, but also in the level of maturity and acceptance of social entrepreneurship. First, it is important to understand, with regard to geographical origin, that two main streams in the concept of social entrepreneurship have been identified – American School of Thought (further divided into American Social Innovation School and American Social Enterprise School) and European School of Thought (strongly connected to social enterprise).

As mentioned before, the maturity and acceptance of social enterprises differ. If we concentrate only on Europe, a different level of acceptance of social entrepreneurship, diverse legislative approach and barriers that social enterprises have to face are observed. Several studies (e.g. Liger et al., 2016; European Commission, 2015) and research networks (e.g. EMES, originally L'Emergence de l'Enterprise Sociale en Europe , or CIRIEC International, originally International Centre of Research and Information on the Collective Economy) are trying to sum up the European situation. Some countries pursue legislation and legal forms of social enterprises appropriate attention. In Italy, there is a separate legal form, social cooperative as per Law No. 381/1991, as well as the special Law on social enterprises (No. 155/2006). In France, there has been operated with Law on social and solidarity economy

(No. 856/2014). Liger et al. (2016) speak about 3 main groups of countries in Europe: (1) countries with the highest level of acceptance of subject of social entrepreneurship (e.g. Italy or France); (2) countries that have reached certain level of acceptance of subjects of social entrepreneurship, but they haven´t so far followed systematic development of normative approach to social economy (e.g. United Kingdom, Denmark, Finland), and finally, (3) countries with very low level of acceptance of subjects of social entrepreneurship including their defining (e.g. Hungary, Czech Republic).

Barriers that social enterprises have to face are continuously subject of scholar attention (e.g. Davies et al., 2019; Hoogendoorn et al., 2019; Pelucha et al., 2017). Despite the fact that barriers are logically country-specific and context driven, a wide range of interlinked aspects inhibiting social enterprise development can be identified among them. Having these aspects in our minds, we sum up and use these aspects in the following primary research (Table 3).

1.   Social entrepreneurship and enterprises in the Czech Republic

Social entrepreneurship is undertaking a growing breadth of activity in the Czech Republic. Nevertheless, there is no legislative acceptance of this concept, even despite the fact that the roots of social economy are deeply going into the middle of 19th century and performing as associations, mutual and worker cooperatives that reached in the time of their peak, before World War II, approx. 16,500 subjects (Fraňková, 2019). Unfortunately, due to the socialist period, a major part of these subjects didn´t survive. The modern age of social entrepreneurship is dated in the 90s of the 20th century and the development has been strongly supported by the European Union funds.

Despite, the growing attention paid to the social entrepreneurship sector, relatively little is still known about the characteristics and scope of social enterprises. This situation complicates the fact that social enterprise has not been legally defined and there are no officially accepted criteria determining social enterprise identification. Thus, a social enterprise in the Czech Republic may appear in different legal forms (mostly public benefit corporation, cooperative, limited liability company) and it is a complicated matter to assess a number of social enterprises. There is no official database. As the most cited list of Czech social enterprises, providing commonly (but not officially legally) accepted criteria of social enterprise, is perceived the website Czech Social Entrepreneurship (Czech Social Entrepreneurship, 2019). Even if the list covers approx. 230 entities, there is a rough estimation that the proportion of social enterprises might be significantly higher, around 3,800 subjects, (Fraňková, 2019). Unfortunately, so far, it is not possible to identify these subjects.

The number of studies and researches in the Czech environment is limited. Especially, the effort to keep systematic records during a certain time period is, in fact, almost negligible. Studies provide mostly information based on an available sample of social enterprises that are usually customized to individual research aim. There are only a few studies (Fraňková, 2009; Liger et al., 2016; European Commission, 2015 or OECD - Organization for Economic Co-operation and Development, 2016) and surveys providing characteristics of Czech social enterprises (see Table 2).

2.   Research and data description

As mentioned before, it remains highly challenging to aggregate social enterprise activity. The estimation of the number and characteristics of social enterprises revealed a diversity of definitions, method of data collection or aim of the concrete research. Thus, there is still a data gap about social enterprises activities.

Our research aims to contribute to the level of knowledge of the social enterprises´ activities. At the beginning we sum up and analyse available surveys providing characteristics of Czech social enterprises in terms to demonstrate limited scope of knowledge in this sector. Further, we concentrate our attention to own empirical approach with a specific focus on 2 different variables to guide the research. First, we explore the perception of barriers of development and self-evaluation of success rate in fulfilling setting goals. These factors, given the previous literature and own provided desk research (P3 - People, Planet, Profit 2014 and 2015; Taušl Procházková, 2015; Liger et al., 2016; Fraňková, 2019; Pelucha et al., 2017) are perceived as one of the most crucial in the process of development of social enterprises and setting appropriate supportive infrastructure. Second, we missed in available researches information about if social enterprises use some management tools and how it is associated with their satisfaction of fulfilling goals. Thus, we focused on that topic as well.

Due to the scope limitation of this paper, only these selected variables are discussed in this paper. However, the research was a part of the more comprehensive study.

For our research, a sample of social enterprises committed to commonly (but not officially legally) accepted criteria of Czech social enterprise identification were used (more on Czech Social Entrepreneurship, 2019). Both criteria, for social enterprises and for work integrated social enterprises, were considered. These commonly accepted criteria were set as essential identification criteria for our research. At the end, a total of 220 social enterprises, following the commonly accepted criteria, were identified based on the authors´ own elaboration. The identification was provided by using several sources: (a) list of social enterprises on the website Czech Social

Entrepreneurship (to date of our research the list contains approx. 170 subjects, however duplications and not corresponding subjects to the commonly accepted criteria had to be removed), (b) other sources such as the Association of Social Responsibility, the Cluster of Social Innovation and Enterprises, the Chambers of Social Enterprises and self-identified group of social enterprises by authors' business register search. A questionnaire was used for empirical research and all 220 identified subjects were asked. Questionnaire was distributed during November 2017 – February 2018. In total, 51 respondents participated (23% return rate). The low number of respondents is a limitation of this research, nevertheless coming back to a few of available surveys (see Table 2) it is still considered as successful return rate. Statistical methods for data analysis are used: method of ranking, Saaty approach, odds ratio ("OR") and Yule's Q.

Regarding the data sample (table 1), the most common legal forms are limited liability companies (27) and benefit corporations (13). The highest concentration of Czech social enterprises is in Prague (17) and Central Bohemia (5). In other regions, the concentration of social enterprises is less than 5. The majority of enterprises were established before 2012 (24 enterprises), in 2012, 10 enterprises, and the rest (17) after 2012. As for the main area of activity, there is huge variability. The most common areas are sectors such as hospitality and accommodation (6); food production (6), education and retraining (6), services in gardening, maintenance, building cleaning (4) or sale (4). Further, respondents are mostly considered as small businesses according to usual number of employees (around 7 – 10) and turnover (around 13 – 15 million CZK). We also control for other aspects of characteristic, such as the main beneficial goal the enterprise is following (table 1) and attitude to financial sources. The majority of respondents target on the topic of equal opportunities (strongly connected with work integration – especially with health disabled people and long-term unemployed) when the number of environmentally or local community-oriented social enterprises is minor. A significant agreement was reached by the topic of financial sources importance. All respondents valued own financial sources, gained by their own business activities, and contributions from the Ministry of Labour and Social Affairs as the most important for making their enterprise viable.

Tab. 12: Sample of respondents

Legal form		Beneficial goal	
Limited liability company	27	Environment and ecology	2
Public benefit company	1	Local community development	3
Cooperative	13	Equal opportunities (esp. employment of disadvantaged people)	32
Association	3	Social area (providing social counselling and social assistance)	11
Social cooperative	6	Cultural area	1
Public company	1	Other	2

Source: Authors' own.

3.   Results

As described above, we follow the empirical approach and explore the perception of barriers of development; self-evaluation of success rate in fulfilling setting goals and identification of management tools that social enterprise use. But first, we have summed up and analysed a list of existing surveys that indicates a level and scope of available knowledge.

Table 2 demonstrates main results. Only surveys covering at least 30 respondents and commonly accepted criteria of social enterprise (more on Czech Social Entrepreneurship, 2019) were analysed. All surveys cover basic descriptive data (legal form, region, employees, sector of activity, type/aim of social enterprise) and financing (sources, limited effort is been observed by following financial results in time). Barriers of development and support framework (often related to legislation) have been discussed often too. Other categories vary. So far, limited focus has been aimed to stakeholders, measurement of impact and approach to management of social enterprises. These data exist mainly in terms of individual case studies or interviews. Hence, this indicates topics for further, detailed research giving potential for getting enough amount of data and creating further recommendations and approaches.

Tab. 2: List of Surveys

Survey	Descriptive data	Stakeholders	Support framework	Financing	Measurement of impact	Barriers	Management tools
P3 (2013)*	✓	✗	✓ (limited)	✓	✗	✗	✗
P3 (2014)*	✓	✗	✓	✓	✗	✓	✗
P3 (2015)*	✓	✗	✓	✓	✗	✓	✗
Taušl Procházková (2016)	✓	✗	✓ (limited)	✓	✗	✓	✗
Ministry of Labour and Social Affairs (2016)**	✓	✗	✓	✓	✗	✗	✗
Taušl Procházková (2017)	✓	✗	✗	✓	✗	✓	✗
Pelucha et al. (2017)**	✓ (limited)	✓ (limited)	✓	✓	✗	✓ (limited)	✗
Wildmannova, 2018	✓ (limited)	✓ (limited)	✓	✓	✗	✓	✗
Own research (2018)***	✓	✓	✓	✓	✓	✓	✓
* Most publicly known surveys. Only several topics has been repeated each year. Limited possibility to follow data in time.							
** Respondents selection follow certain criteria. Thus, gained data might by affected by these criteria.							
*** For purpose of this paper are presented only descriptive data, barriers, management tools.							
Notes: Maximum number of respondents (151), minimum (30), average (57). *Additional surveys are mentioned in Fraňková (2019), however without possibility to get data (not published).*							

Source: P3 - People, Planet, Profit (2013, 2014, 2015); Taušl Procházková (2016); Taušl Procházková (2017); Pelucha et al. (2017); Wildmannova (2018), Ministry of Labour and Social Affairs (2016); authors' own.

Summing-up the available surveys, it must be noted that these surveys represent only a certain part of Czech social enterprises (mainly work integration). Surveys are not structured according same criteria and follow only partially similar topics of interest. However, we explored, after comparison of all gained descriptive data, that the respondents´ characteristic of our survey (chapter 2) is in line with majority of results of previous surveys on Czech social enterprises; thus we can conclude that indicates basic attributes and trends in this sector.

We further focus on our own survey and aims dedicated to barriers and management. First, it is worth mentioning that there are internal, but also external barriers influencing social enterprise development. Being aware and able to evaluate these factors seems important not only for social enterprises but also for other stakeholders. Hence, respondents evaluated the importance of such barriers on a scale (1 - significant influence, 2 - low influence and 3 - no influence). For further elaboration scale 1 and 2 showing some kind of influence were merged, scale 3 shows no influence. The significance of barriers was analysed by using method of multicriteria decision - ranking and Saaty´s approach. Saaty´s approach showing pairwase comparisions between criteria (and decision alternatives) was calculated using a 9-unit scale (scale 1 = bariers are equal, scale 9 = absolute preference of one barier over the second one). The most important barriers are coloured grey. Social enterprises consider the lack of time, insufficient state of their marketing activities, insufficient legislative background and poor activities in sales as the most important and influencing barriers on their way to growing.

Tab. 3: Influence of Barriers

Barrier	Total	Weight (Ranking)	Weight (Saaty)
Lack of time	49	**0.15**	**0.22**
Poor marketing activities	44	**0.13**	**0.14**
Poor activities in sales	42	**0.12**	**0.10**
Poor financial management and situation of the company	33	0.04	0.04
Dissatisfaction with employees	29	0.03	0.02
Insufficient support from public institutions	40	0.09	0.09
Insufficient legislative background	44	**0.13**	**0.14**
Insufficient knowledge of basic business principles	37	0.08	0.06
Stakeholders have a low level of understanding of the concept of social entrepreneurship	36	0.06	0.05
Customers react negatively to work with a disadvantaged group of people	27	0.01	0.02
Access to financial resources	41	0.10	0.09
Absence of commonly accepted mechanism enabling to measure the impact of social enterprise activities	33	0.04	0.04

Source: Authors' own.

These results indicate that respondents perceive as the most influencing factors rather internal than external factors and that they are mostly aware of potential aspects for improvement. We further focus attention to interlinked factors and that on (a) self-evaluation of satisfaction of success rate in fulfilling setting goals, (b) aspects of management. Table 4 provides respondents evaluation (on a scale 1 – excellent to 5 – very poor) of fulfilling setting goals. The average rating is 2.31 and shows rather a satisfaction than dissatisfaction in the way how respondents are satisfied in their goals´ fulfilment. However, it also opens a debate about how to improve the rate of satisfaction and what kind of variables play significant role in that.

Tab. 4: Fulfilling of Enterprise Goals

Fulfil of enterprise goals	1	2	3	4	5	Average rating
Limited liability company	3	10	12	2		**2.48**
Public benefit company	1					**1.00**
Cooperative	2	7	4			**2.15**
Association		1	2			**2.00**
Social cooperative	2	2	2			**2.67**
Public company		1				**2.00**
Total	**8**	**21**	**20**	**2**	**0**	**2.31**

Source: Authors' own.

In order to be able to meet enterprise goals, social enterprise, such as another (non)commercial entities, may use various managerial tools. First, Table 5, second column, shows how much enterprises use selected tools of management. Tools were selected according to authors´ own experience with social enterprises and according the fact that social enterprises are mainly understand as small subjects (based on surveys analysis). Social enterprises work actively with some of the tools, and they are most experienced with setting goals (32 subjects), basic determination of strategy (30 subjects) and enterprise mission (23 subjects). Experience and using with other approaches is limited on their side. Besides these results, no significant differences in attitude to using these tools were observed by each separate legal form.

Second, reached results can be easily linked to the self-evaluation of fulfilling enterprise goals provided in Table 4. Table 5 provides the odds ratio (OR) and Yule's Q. In order to use odds ratio and Yule´s Q technique, data from Table 4 are merged (YES - 1 and 2; NO - 3 and 4; 5 not represented). These results show some interesting facts (more in Table 5). There are several statistically significant degrees of association (except for competition analysis) the most significant degrees of the association are coloured grey. The rate of intensity is particularly important for using managerial accounting or determining business strategy. In general, social

enterprises that use tools tend to perform well. These results open topic for further research. First, we can clearly see that setting mission, goals and especially enterprise strategy associate if the company is doing well. Further, since many social enterprises struggle with poor financial management, recommendation to apply managerial accounting principles should follow too. Besides these recommendations, results regarding SWOT analysis and competition analysis show no association or lower level of association. The question remains why is it? In that case, we assume that (a) this research has limitation due to the number of respondents and (b) we can only argue how deep are respondents experienced with these tools and ability to use them right according to their characteristic.

Tab. 5: Odds Ratio (OR) and Yule's Q

Management tools	No of enterprises (actively used)	OR	Yule's Q	Conclusion
Mission set up	23	1.354	0.15044	Social enterprises that set up a mission are rather doing well.
Enterprise goals set up	32	1.25874	0.114551	Social enterprises that set up themselves goals are rather doing well.
Enterprise strategy set up	30	2.1	**0.354839**	Social enterprises that set up their strategy are doing well (relatively high rate of association).
SWOT analysis	22	0.75789	-0.137728	Social enterprises that do not carry out a SWOT analysis are rather doing well.
Competition analysis	19	0.9625	-0.019108	There is no difference.
Managerial accounting	13	3.483333	**0.553903**	Social enterprises that perform managerial accounting tend to perform well (very high rate of the association).
Enterprise does not use any tool.	8	0.36429	**-0.465964**	Social enterprises that use tools tend to perform well (high rate of the association).

Source: Authors' own.

Conclusion

Social entrepreneurship has gradually become a trend that initiated a shift towards studies at a theoretical and empirical level. While being aware of theoretical concepts, getting relevant empirical data brings a challenge. Therefore, the main aim of our paper was to extend the level of knowledge on a characteristic of Czech social enterprises.

We understand that the Czech sector of social entrepreneurship struggles with insufficient legal acceptance and lack of empirical data that leads to another complication on the way of development of this sector. Thus, we firstly focus on getting relevant data to social enterprises and contribute to the existing body of knowledge. Building on previous studies and surveys, we

have proposed a list of barriers of development that was used for empirical research (table 3) and provide a list of the main available surveys (table 2).

We have confirmed that the so far mentioned picture of social enterprises according to available studies mostly corresponds. Czech social enterprises have several legal forms, and dominant are limited liability companies and public benefit companies. Also, regional concentration answers, as far as most common sectors of activity and dominant aim that enterprises follow. Work integration social enterprises are typical for the Czech environment. We also found out that it is hardly possible, under current conditions, to get relevant data of financial situation during some time period. We find positive that we were able to confirm the initial picture of Czech social enterprises in comparison to main available studies. However, there is very limited access to quantitative data, and surveys are not provided periodically, thus little is possible to do in the effort to get more concrete data and set appropriate steps according to them.

Following our initial findings, we gained data from our own research according to respondents´ perception of barriers to development. Internal factors have been marked as the most influencing. Further, we focused on satisfaction with goals fulfilment and the approach of respondents to apply several management tools. We found out that there is definitely space for improvement that might be helpful in order to meet enterprise goals. Several further questions has been appeared such as, if social enterprises understand well how to apply management tools.

Although our paper has followed and extended the existing body of knowledge, our primary research is limited by available data. Future research should follow when the aim to collect data with systematic and methodical effort should be definitely taken into account. However, such effort can not be easily provided without active implementation of important stakeholders, such as key governmental bodies, and it is not only time-consuming, but also financially demanding. But, obtained results can enable to support the development of this sector including appropriate policies (e.g. supportive programme policies, tailored educational policies, legislative changes), showing its importance and strengthen the position of social enterprises among other ecosystem bodies.

Acknowledgement

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ENTREPRENEURSHIP FUNDING FROM PUBLIC VENTURE CAPITAL: CASE OF KOSOVO

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Abstract

Purpose: This paper aims to identify the determinant criteria and their importance for enterprise funding from public venture capital in Kosovo. In addition, this paper seeks to increase transparency and avoid biased decisions during evaluation process.

Design/methodology/approach: TOPSIS to the fuzzy environment method proposed by (Chen, 2000) is applied in this paper. Entrepreneurs applying for the funds are set as a sample and commissioners in the Steering Committee as decision-makers. A set of 9 criteria is used in the paper.

Findings: The results suggested that "Employment Creation Prospects" of enterprises and "Entrepreneurial Skills and Knowledge" of entrepreneurs are the two most decisive criteria for capital access from public sources. "The invention and Innovation of Products, Services, and Business Models" alongside a "Feasible Business Plan" are the third and fourth determinant criteria. The least important criteria are "The Estimated Costs-Expected Results Ratio" and "Attractiveness for Foreign Investors".

Research/practical implications: Enterprises capable of generating jobs are at the forefront of being financially supported by public venture capital. Additionally, entrepreneurs demonstrating certain levels of knowledge and equipped with skills have more funding prospects from public venture capital. Enterprises' self-financing capability is necessary however, it is not a determinant criterion in being financially supported from PVC**.**

Originality/value: This study attempts to create a fair process for enterprise funding selection by applying TOPSIS multi-criteria decision analysis method as an unbiased tool.

Keywords: entrepreneurship, start-up, SMEs, funding, TOPSIS

JEL Codes: M13, G24, C02

Introduction

Entrepreneurial financing is a distinctive aspect of entrepreneurship representing one of the biggest challenges for entrepreneurs. This aspect has undergone a significant transformation in recent years. Block et. al. (2018) described these changes by explaining the new players and using four-dimensional analysis; debt or equity, investment goal, investment approach, and investment target. A very common form of equity financing is venture capital. Karsai (2018) defined venture capital as equity finance provided by external investors to high-potential but very risky small enterprises playing an important role in promoting innovation and facilitating access to financing for SMEs. Apart from private players, governments seem to be increasingly involved in financing enterprises. A considerable amount of money is provided to entrepreneurs from the public funds via different governmental agencies. Within the "Horizon 2020" framework, the European Commission has allocated nearly 80 billion euros of funding available over the last 7 years (European Commission, 2020). Particularly in developing countries, considering very weak law enforcement and management control systems the distribution of public funds has been questioned. Also, Dvoulety and Blazkova (2019) noted absence in the policy debate about the effectiveness of the public interventions funded from the taxpayer's money. In this context, the study is focused on the selection process of enterprises seeking public funding in Kosovo. TOPSIS numerical method will be applied in order to identify and prioritize key criteria for enterprise funding from public venture capital as well as rank and select the applicant enterprises.

1.   Materials and Methods

TOPSIS multi-criteria decision method is used for the purpose of this study. TOPSIS is a mathematical method applied in the literature for the selection of the most adequate options from all feasible alternatives through distance measures. Most of the decision-making problems arise when qualitative and quantitative attributes are assessed using human judgment and inaccurate data (Li & Yang, 2004). TOPSIS to the fuzzy environment method proposed by (Chen, 2000) is applied in this paper. A multi-criteria decision making (MCDM) problem is given in the matrix expressed as follows:

$$
D = \begin{array}{c} \\ \\ A_1 \\ A_2 \\ \vdots \\ A_m \end{array}
\begin{array}{c} W_1 \quad\; W_2 \quad \cdots \quad W_n \\ C_1 \quad\;\; C_2 \quad \cdots \quad C_n \\ \left[\begin{array}{cccc} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{array} \right] \end{array}
\qquad (1)
$$

where D refers to the decision-maker, { A_1, A_2, $\cdots$, A_m } are alternatives among decision-makers choose, { C_1, C_2, $\cdots$, C_n } are criteria which measure alternatives, and X_{mn} is the evaluation of alternative A_m with respect to criterion C_n. While, { W_1, W_2, $\cdots$, W_n } represents the weight of criterion C_n assessed by decision-makers.

Linguistic variables are used to assess qualitative and quantitative attributes. In the table below are shown linguistic variables for importance weight of each criterion:

Table 1. Linguistic Variables for Importance Weight of Each Criterion

Linguistic Terms	Very High (VH)	High (H)	Medium (M)	Low (L)	Very Low (VL)
Fuzzy Number	(0.8, 1, 1)	(0.6, 0.8, 1)	(0.3, 0.5, 0.7)	(0, 0.2, 0.4)	(0, 0, 0.2)

Note: In this study Chen's 7-scale variables are converted into 5-scale variables

Linguistic scale and triangular fuzzy numbers which are used to evaluate alternatives with respect to qualitative attributes are as follows:

Table 2. Linguistic Scale for Alternative Evaluation

Linguistic Terms	Very Good (VG)	Good (G)	Fair (F)	Poor (P)	Very Poor (VP)
Fuzzy Number	(8, 10, 10)	(6, 8, 10)	(3, 5, 7)	(0, 2, 4)	(0, 0, 2)

Note: In this study Chen's 7-scale variables are converted into 5-scale variables

Formulas used for calculating the importance of the criteria and alternative evaluation with respect to each criterion are:

$$\widetilde{X}_{ij} = \frac{1}{K}\left[\tilde{x}_{ij}^1 (+)\tilde{x}_{ij}^2 (+) \cdots (+)\tilde{x}_{ij}^k\right] \tag{2}$$

$$\widetilde{W}_j = \frac{1}{k}\left[\tilde{w}_j^1 (+)\tilde{w}_j^2 (+) \cdots (+)\tilde{w}_j^k\right] \tag{3}$$

where K represents decision maker. Also, normalized fuzzy decision matrix (**1**) can be expressed as $\tilde{R} = \left[\tilde{r}_{ij}\right]_{mxn}$ (**4**), where B and C represent benefit and cost criteria as follows $\tilde{r}_{ij} = \left(\frac{a_{ij}}{c_j^*}, \frac{b_{ij}}{c_j^*}, \frac{c_{ij}}{c_j^*}\right), j \in$ B and $\tilde{r}_{ij} = \left(\frac{a_j^-}{a_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{c_{ij}}\right), j \in$ C where $c_j^* = \max c_{ij}$ if $j \in$ B, and $a_j^- = \min a_{ij}$ if $j \in$ C. Taking into consideration the different importance of each criterion, (Chen, 2000) constructed the weighted fuzzy decision matrix as $\tilde{V} = \left[\tilde{v}_{ij}\right]_{mxn}$ (**5**), i= 1, 2, …, m, $j =$ 1, 2, …,n where $\tilde{v}_{ij} = \tilde{r}_{ij}x\tilde{w}_j$. Also, variables $\tilde{v}_{ij}$, $\forall i,j$ are normalized positive triangular fuzzy numbers ranging between 0 and 1. So, fuzzy positive ideal solution (FPIS, A^*) and fuzzy negative ideal solution (FNIS, A^- can be expressed as $A^* = (\tilde{v}_1^*, \tilde{v}_2^*, \cdots, \tilde{v}_n^*)$ and $A^- = (\tilde{v}_1^-, \tilde{v}_2^-, \cdots, \tilde{v}_n^-)$ where $\tilde{v}_1^* =(1, 1, 1)$ and $\tilde{v}_1^- = (0, 0, 0)$, $j=$ 1, 2, …,n.

Distances from positive ideal solution (D^*) and negative ideal solution (D^-) are calculated based on the formulas:

$$D_i^* = \sum_{j=1}^{n} d\left(\tilde{v}_{ij}, \tilde{v}_j^*\right), i = 1, 2, \dots, m. \tag{6}$$

$$D_i^- = \sum_{j=1}^{n} d\left(\tilde{v}_{ij}, \tilde{v}_j^-\right), i = 1, 2, \dots, m. \tag{7}$$

where D (.,.) shows the distance between fuzzy numbers. The closeness coefficient (CC) determines the ranking order of alternatives. Values closest to 1 are the closest to positive ideal solution A^* and values closest to 0 are the closest to negative ideal solution A^-. Using the formula below we can rank alternatives from the best to the worst:

$$CC_i = \frac{D_i^-}{D_i^* + D_i^-}, i = 1, 2, \dots, m. \tag{8}$$

2. Results and Discussion

The "Innovation Fund" is a fund co-financed by the Ministry of Innovation and Entrepreneurship of the Republic of Kosovo and the German Federal Ministry for Economic Cooperation and Development (BMZ) which is implemented by Innovation Centre Kosovo. Innovation Centre Kosovo (ICK) represents the main body in Kosovo providing financial support to micro, small and medium enterprises through the "Innovation Fund" grant scheme. The main objectives of ICK are the improvement of existing or new products, processes, and services through innovation, the increase of Kosovar MSMEs' competitive and export capabilities, and employment promotion.

A set of 9 selection criteria is used in this paper. An enterprise is accepted for funding evaluation only if it fulfills all technical and procedural criteria stipulated in the "Innovation Fund" Grant Manual (Innovation Centre Kosovo, 2019). After technical and procedural criteria are met then a proposal of applicant enterprise is considered for funding based on the following 9 criteria:

Table 3. Set of Criteria

Abbreviation for Criteria	C_1	C_2	C_3	C_4	C_5
Criteria	Relevance to Objectives and Priorities of ICK	Export Capabilities	Improvement Capabilities for Existing or New Product(s), Service(s), Process(es)	Employment Creation	Plan Consistency and Feasibility
Abbreviation for Criteria	C_6	C_7	C_8	C_9	
Criteria	Entrepreneurs Know-How and Self-Financing Capability	Appropriate Budgeting	Estimated Costs-Expected Results Ratio	Foreign Investment Attractiveness	

Source: (Innovation Centre Kosovo, 2019), "Innovation Fund" Grant Manual, p. 10.

Steering Committee is the final decision-making body for fund allocation. Committee is composed of 6 commissioners each representing namely Ministry of Innovation and Entrepreneurship (MIE), Ministry of Economic Development,(MED), Ministry of Agriculture, Forestry and Rural Development (MAFRD), Kosovo Investment and Enterprise Support Agency (KIESA), Kosovo Chamber of Commerce (KCC) and German Federal Ministry of Economic Cooperation and Development (BMZ). All 6 commissioners are responsible for the final evaluation and selection of the applicant enterprises. Decisions are taken based on the one-member-one-vote (OMOV) method. Therefore, a set of 6 decision-makers is applied with all the decision-makers equal in importance weight to 0,166.

Table 4. Importance Weights of Decision Makers

Decision Makers	D_1	D_2	D_3	D_4	D_5	D_6
Importance Weight	0.166	0.166	0.166	0.166	0.166	0.166

Source: (Innovation Centre Kosovo, 2019), "Innovation Fund" Grant Manual, p. 9.

Using linguistic and triangular fuzzy variables for importance weight of each criterion listed in Table 1 and formula (2) and (3), criterion importance weight matrix is as follows:

Table 5. Criterion Importance Weight Matrix

Criteria	Decision Makers						Weight	Rank
	D_1	D_2	D_3	D_4	D_5	D_6		
C_1	H	H	H	H	H	H	(0.6, 0.8, 1)	6
C_2	VH	H	H	VH	H	VH	(0.7, 0.9, 1)	5
C_3	VH	H	H	VH	VH	VH	(0.73, 0.93, 1)	3

C_4	VH	VH	VH	VH	VH	VH	(0.8, 1, 1)	1
C_5	VH	H	H	VH	VH	VH	(0.73, 0.93, 1)	4
C_6	VH	VH	H	VH	VH	VH	(0.77, 0.97, 1)	2
C_7	H	M	M	H	H	M	(0.45, 0.65, 0.85)	7
C_8	H	M	M	M	H	M	(0.4, 0.6, 0.8)	8
C_9	H	M	M	M	H	M	(0.4, 0.6, 0.8)	9

Source: Decision Makers Evaluation and author's calculations.

Table 6 shows alternative ratings by decision makers with respect to criteria:

Table 6. Alternatives Rating

Criteria	Alternatives	Decision Makers					
		D_1	D_2	D_3	D_4	D_5	D_6
C_1	A_1	F	F	G	P	G	G
	A_2	VG	VG	VG	VG	VG	G
	A_3	VG	VG	G	G	G	G
C_2	A_1	G	G	F	F	G	F
	A_2	G	VG	VG	VG	G	VG
	A_3	F	G	G	G	G	G
C_3	A_1	G	G	F	F	F	G
	A_2	VG	VG	VG	G	G	VG
	A_3	G	G	VG	VG	G	G
C_4	A_1	F	G	F	G	F	F
	A_2	VG	VG	G	VG	VG	VG
	A_3	G	VG	VG	G	G	G
C_5	A_1	G	F	F	G	F	F
	A_2	G	G	VG	G	G	VG
	A_3	F	G	G	G	F	F
C_6	A_1	F	F	F	G	F	G
	A_2	VG	VG	VG	VG	VG	VG
	A_3	G	VG	VG	VG	G	G
C_7	A_1	G	F	G	P	G	F
	A_2	G	G	G	F	F	G
	A_3	F	F	F	F	G	G
C_8	A_1	G	P	P	P	F	F
	A_2	G	G	G	F	G	G
	A_3	G	F	F	F	G	G
C_9	A_1	F	F	F	P	G	G
	A_2	VG	G	G	G	VG	G
	A_3	F	F	F	P	G	G

Source: Decision Makers Evaluation and author's calculations.

Table 7 shows the fuzzy decision matrix:

Table 7. Fuzzy Decision Matrix

	Criteria		
Alternatives	C_1	C_2	C_3
A_1	(4, 6, 8)	(4.5, 6.5, 8.5)	(4.5, 6.5, 8.5)
A_2	(7.67, 9.67, 10)	(7.33, 9.33, 10)	(7.33, 9.33, 10)
A_3	(6.67, 8.67, 10)	(5.5, 7.5, 9.5)	(6.67, 8.67, 10)
	C_4	C_5	C_6
A_1	(4, 6, 8)	(4, 6, 8)	(4, 6, 8)
A_2	(7.67, 9.67, 10)	(6.67, 8.67, 10)	(8, 10, 10)
A_3	(6.67, 8.67, 10)	(4.5, 6.5, 8.5)	(7, 9, 10)
	C_7	C_8	C_9
A_1	(4, 6, 8)	(2, 4, 6)	(3.5, 5.5, 7.5)
A_2	(5, 7, 9)	(5.5, 7.5, 9.5)	(6.67, 8.67, 10)
A_3	(4, 6, 8)	(4.5, 6.5, 8.5)	(3.5, 5.5, 7.5)

Source: Author's calculations.

Then normalized decision matrix is calculated for benefit criterion using following formula $C_1^* = \max_i\{C_{ij}\}$ (**9**). Considering formula (**4**) for benefit criteria and alternatives A_1, A_2, A_3 normalized decision matrix is as follows:

Table 8. Normalized Decision Matrix

	Criteria		
Alternatives	C_1	C_2	C_3
A_1	(0.4, 0.6, 0.8)	(0.45, 0.65, 0.85)	(0.45, 0.65, 0.85)
A_2	(0.77, 0.97, 1)	(0.73, 0.93, 1)	(0.73, 0.93, 1)
A_3	(0.67, 0.87, 1)	(0.55, 0.75, 0.95)	(0.67, 0.87, 1)
	C_4	C_5	C_6
A_1	(0.4, 0.6, 0.8)	(0.4, 0.6, 0.8)	(0.4, 0.6, 0.8)
A_2	(0.77, 0.97, 1)	(0.67, 0.87, 1)	(0.8, 1, 1)
A_3	(0.67, 0.87, 1)	(0.45, 0.65, 0.85)	(0.7, 0.9, 1)
	C_7	C_8	C_9
A_1	(0.44, 0.67, 0.89)	(0.21, 0.42, 0.63)	(0.35, 0.55, 0.75)
A_2	(0.56, 0.78, 1)	(0.58, 0.79, 1)	(0.67, 0.87, 1)
A_3	(0.44, 0.67, 0.89)	(0.47, 0.68, 0.89)	(0.35, 0.55, 0.75)

Source: Authors' calculations.

Afterwards, using formula (**5**) $\tilde{V} = [\tilde{v}_{ij}]_{mxn}$ weighted normalized fuzzy decision matrix is calculated, where $\tilde{v}_{ij} = (\tilde{r}_{ij}) x \, \tilde{w}_j$. For $\tilde{v}_{11} = (\tilde{r}_{11}) x \, \tilde{w}_1 = (0.4, 0.6, 0.8) \times (0.6, 0.8, 1) = (0.24, 0.48, 0.8)$. All results are presented in Table 9:

Table 9. Weighted Normalized Fuzzy Decision Matrix

Alternatives	Criteria		
	C_1	C_2	C_3
A_1	(0.24, 0.48, 0.8)	(0.315, 0.585, 0.85)	(0.329, 0.605, 0.85)
A_2	(0.462, 0.776, 1)	(0.511, 0.837, 1)	(0.533, 0.865, 1)
A_3	(0.402, 0.696, 1)	(0.385, 0.675, 0.95)	(0.489, 0.809, 1)
	C_4	C_5	C_6
A_1	(0.32, 0.6, 0.8)	(0.292, 0.558, 0.8)	(0.308, 0.582, 0.8)
A_2	(0.616, 0.97, 1)	(0.489, 0.809, 1)	(0.616, 0.97, 1)
A_3	(0.536, 0.87, 1)	(0.329, 0.605, 0.85)	(0.539, 0.873, 1)
	C_7	C_8	C_9
A_1	(0.198, 0.436, 0.757)	(0.084, 0.252, 0.504)	(0.14, 0.33, 0.6)
A_2	(0.252, 0.507, 0.85)	(0.232, 0.474, 0.8)	(0.268, 0.522, 0.8)
A_3	(0.198, 0.436, 0.757)	(0.188, 0.408, 0.712)	(0.14, 0.33, 0.6)

Source: Author's calculations.

Fuzzy Positive Ideal Solution to be FPIS = $(\tilde{v}_1^*, \tilde{v}_2^*, \tilde{v}_3^*, \tilde{v}_4^*, \tilde{v}_5^*, \tilde{v}_6^*, \tilde{v}_7^*)$ and Fuzzy Negative Ideal Solution FNIS = $(\tilde{v}_1^-, \tilde{v}_2^-, \tilde{v}_3^-, \tilde{v}_4^-, \tilde{v}_5^-, \tilde{v}_6^-, \tilde{v}_7^-)$ with respect to $\tilde{v}_j^* = (1,1,1)$ and $\tilde{v}_j^- = (0,0,0)$. Using formula (**6**) and (**7**) distances of FPIS and FNIS are calculated and given in the following table:

Table 10. Distance Measurement

	d^*	d^-
A_1	5.673	5.596
A_2	3.646	7.592
A_3	4.546	6.788

Source: Authors' calculations.

Based on formula (**8**) closeness coefficient CC_i is calculated. Results and ranking order of alternatives A_1, A_2, and A_3 are presented below:

Table 11. Closeness Coefficient

	CC_i	Rank
A_1	0.497	3
A_2	0.676	1
A_3	0.599	2

Source: Authors' calculations.

Conclusion

In this paper, findings suggested that criterion with utmost importance weight is "Employment Creation" (0.8, 1, 1). The second criterion with the highest importance weight is "Entrepreneurs Know-How and Self-Financing Capability" (0.77, 0.97, 1). The third and fourth criteria share the same importance of weight (0.73, 0.93, 1). In addition, "Estimated Costs-Expected Results Ratio" and "Foreign Investment Attractiveness" share the same importance weight as well (0.4, 0.6, 0.8). Based on the results from Table 10, the fuzzy positive and negative ideal solution distances for A_2 are respectively 3.646 and 7.592. While distances for A_3 are FPIS 4.546 and FNIS 6.788, and for A_1 FPIS 5.673 and FNIS 5.596. The closeness coefficients to the positive ideal solution and furthest to the negative ideal solution indicate preferential order of enterprises as $A_2 > A_3 > A_1$ (0.676 > 0.599 > 0.497).

The results suggest that entrepreneurs stimulating innovation and employment have higher prospects of being financially supported by public venture capital from IF in Kosovo. Moreover, entrepreneurs' expertise and competence are the second determinant criteria. Self-financing capability is considered important. However, it is not the most determinant factor. In this regard, it can be stated that entrepreneurs' financial constraints can be overcome once the talent and ingenuity are demonstrated. "Attractiveness for a Foreign Investor" and "Estimated Cost-Expected Results Ratio" seems to be of later significance.

Block et. al. (2018) stated that entrepreneurial financing has become a complex and difficult process due to the variety of investment goals and approaches for new players. As such, private and public investors may apply different criteria for entrepreneurship funding. Colombo et. al. (2014) stated that during the selection process governments consider firms' social payoffs or localized public benefits even though the firm may be risky in terms of return. In another study, Block et. al. (2019) indicated that for private investors the most important criterion is revenue growth, followed by the value-added of product/service, the management team's track record, and profitability.

While this study intended to improve the efficiency of the venture capital programs in the evaluation and selection phase, some other studies have assessed the efficiency or success of entrepreneurial ventures backed by government venture capital. Unlike the general perception that financing would increase prospects for successful enterprises, for six financial variables, Dvoulety et. al. (2019) were unable to conclude that funded enterprises would be better off in comparison to non-funded firms in a short-term. In another study, Dvoulety et. al. (2020) pointed out that significant differences exist regarding the time period analysis and heterogeneity of effects with

respect to enterprise size, age, region, industry, and intensity of support. Rodriguez-Gulias et. al. (2018) study showed different outcomes of venture capital in the Spanish and Italian cases while exploring the effect of venture capital investors on the University Spin-Offs.

Regarding the evaluation and selection process, some other aspects should be considered. Hassan et. al. (2020) refer to gender bias within the venture capital industry as an element affecting optimal fund allocation. Huang and Pearce (2015) use the term "gut feel" to explain investor's emotional and cognitive responses when making investment decisions. Their findings showed that investors combine intuition and formal analyzes in following their "gut feel" while identifying successful investments. Similarly, Baron (2008) using the term "affect" for feelings and moods suggested that they influence many aspects of cognition and entrepreneurial behavior. However, if for entrepreneurs risking their private assets and capital "gut feel" or intuition may be a legitimate behavior, this term may be questionable for investors or decision-makers acting on behalf of the public interest from public funds. Besides, the study has some limitations. Governmental funding bodies and stipulated criteria, as well as decision-makers representing the public interest and their assessment, may be subject to change over time. Thus, a longitudinal study can be suggested.

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CREATIVE CENTERS IN THE CZECH REPUBLIC

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Abstract

Purpose: The purpose of the following study was to investigate the regional distribution, diffusions in terms of time and ownership characteristics of creative centers in the territory of the Czech Republic. It also sought the answer the question whether the density of creative industries impacts the geographic distribution of creative centers.

Design/methodology/approach: The list of creative centers is based on online research using search engines google.com and anopress.cz. A search was performed using the key words creative center, creative incubator, creative hub, cultural center and creative cluster. The date of establishment, location and type of ownership was added to each center. A correlation analysis was then employed to explore a relationship between the density of creative industries and the distribution of creative centers.

Findings: The result of this study is a list of 25 creative centers. 12 centers are located in Prague, followed by the South Moravian Region (4), West Bohemia Region (2) and Moravian-Silesian Region (2). The first center was established in 1999; 5 centers were established before 2010. The largest number of the centers was founded in 2015 (5) and 2016 (6). 3 centers are private, 7 municipal, and 15 centers are based on a non-profit basis. There is a positive relationship between the density of creative industries and the presence of creative centers.

Research/practical implications: The paper provides implications for further research of creative centers in the Czech Republic, concerning significant reasons for their regional distribution, awareness, measuring activity and performance, benchmarking, etc. As for practical implications, the paper suggests a need for legislative definition, especially for subsidy programs and can be used as a basis to measure the impact of upcoming government support.

Originality/value: The main contribution and added value of this paper are in addressing the need to study the "creative center" phenomenon in the Czech Republic. For the first time, the paper brings the description of creative centers distribution in the Czech Republic, and the answer to the question whether the regional or district density of creative industries impacts creative centers distribution.

Keywords: creative center, creative economy, creative industry, creativity, sustainability

JEL Codes: L31, L32, R12

Introduction

Since 2014, the European Commission supported its framework program Creative Europe for the development of the culture, creative and audiovisuals sectors with a budget of €1.46 billion. The main program axes sought to strengthen the sector's potential on the transnational level, stimulate the international distribution of works and industry operators in addition to reaching new audiences in Europe and beyond, promote the use of innovative and creative approaches, strengthen the sector's financial potential, and to strengthen decision-making mechanisms. In 2018, the European Council agreed its position on the regulation establishing the Creative Europe program for 2021-2027. The program now aims to increase the competitiveness of the cultural and creative sectors and might provide a chance for the development of the whole creative sector in all European Union member states, the Czech Republic included (EC, 2018).

There have been several attempts to describe the current state of the creative sector, namely creative industries, in the Czech Republic; however, none of these focused directly on creative centers as one of the representants of the physical presence of the creative industries in the territory of the Czech Republic. Since there is expected development of the creative industries sector in the near future, this study aims to investigate the current regional distribution, diffusions in terms of time and ownership characteristics of creative centers. And to create a list of institutionalized creative centers in the territory of the Czech Republic. This list might be used for further research, and as a potential knowledge base for future comparisons and monitoring of future development.

1. Creative economy – Creative industries

A concept of creative economy evolved partially as a reaction to changing paradigms of economic systems, which, in the past, were based on proceeding and consuming material resources harvested from nature. Unlike these traditional systems, the creative economy is prevalently driven by non-material resources like human imagination and capability of producing innovative thoughts and further transforming them into innovation (Howkins, 2002). Creative industries are a long-time updated range of economic activities that use human creativity as the ultimate economic resource (Florida, 2002; Landry, 2012). It is often mentioned that the concept of the creative economy expands the creative industries range, which is usually presented as limited to specific sectors, and contains any creativity-based activity throughout a whole economy. However, even the author of creative economy concept John Howkins comprises in the creative economy namely advertising, architecture, art, crafts, fashion, film, music, performing arts, publishing, R&D, software, toys, games, TV, radio and

video games (Landry, 2012; Howkins, 2002). Sometimes it is criticized that all mentioned concepts tending to emphasize the creativity-culture dimension and therefore are unable to set these dimensions apart. The creative economy and creative industries are often presented as an integral part of the cultural and creative economy or cultural and creative industries (Slach et al., 2013; Cikánek, 2009). For example, technical or scientific creativity is, as you can see, heavily neglected in both concepts. Most of the current publicly accepted "creative" concepts suffer from their over-orientation on culture and lack complexity in terms of coverage of the whole economy, so the need for a new, different, theory is obvious (Landry, 2012; Žáková, 2009; Slach et al., 2013; Marková et al., 2013; Cikánek, 2009).

2.   Creative center

The term of the creative center was, and still is, at first connected to the term creative city, or, more precisely, creative cluster, usually used as a synonym. According to Florida, every creative city, cluster, or center is defined by a certain level of a creativity index. Creativity index is a concept of an index consisting 7 sub-indexes: talent index based on percentage of presence of university-educated people in the area; innovation index based on number of patents per person; high-tech index based on size and concentration of regional economic growth in technological sectors; melting pot index based on percentual presence of immigrants; gay index based on presence of same-sex couples; bohemian index based on presence of art-oriented people; and composite-diversity index based on ethnical and cultural diversity. Locations with the highest values of creativity index are so-called creative centers (Florida, 2002). In the past years, the creativity index has been criticized for over-valuating the university education and favoritism of certain social groups and for the unclear application of the whole concept into practice (Ponzini and Rossi, 2010).

Other perspectives are predominantly based on the "cluster" concept, which defines a cluster as a: "geographic concentration of interconnected companies and institutions in a particular field including suppliers of specialized inputs. Clusters often extend downstream to channels and customers and laterally to manufacturers of complementary products and to companies in industries related by skills, technologies, or common inputs. Many clusters include governmental and other institutions—universities, standards-setting agencies, think tanks, training providers, and trade associations—that provide specialized training, education, information, research, and technical support" (Porter, 1998). In this context, it seems to be natural that the creative clusters are present usually in larger cities, where is a certain level of demand for cultural infrastructure.

Creative regions, cities, quarters, clusters, and centers have a lot in common. They are: „places with a certain level of original and deep knowledge coupled with a ready supply of skills, competence and people who have the need and capacity to communicate with each other" (Landry, 2000). They differentiate mostly in size and origin. Nature of their origin is a topic of discussion of more present researchers that are tending to distinguish between organically emerged and policy emerged creative centers, clusters, or localities at all. And also, between institutional and non-institutional nature. Government and policy support led to the renovation of a large number of localities that would have a little use otherwise, but also changed the characteristics of these localities. In some cases, the rents went up, and along with formal interventions dislodged the original community (Li and Liu, 2019).

The Czech researchers contributed to the topic by defining the ten rules for successful creative incubators which consists: involvement of all interested actors into planning; functional connection of the location the other parts of the city; preference of smaller projects; multi-source financing; non-stop opening times; multi-functional usage of the location; sustainable management and financing; marketing and PR; networking; and trend-seeking and learning (Marková et al., 2013). Even though these rules are focused on creative incubators, they apply to creative centers.

With all the presented approaches in mind, it is possible to distinguish creative centers from other non-institutionalized manifestations of creative industries, which are creative clusters, creative cities, etc. and also the institutionalized culture centers and creative incubators. Culture center is an institution that produces performative artistic or cultural activity exclusively with the absence of creative output, for example, a gallery or music club. The creative center is an institution that produces performative artistic or cultural activity but also necessarily produces a creative industry type output - design, architecture, musical recordings, etc. In short, a creative center is a multi-functional place with shared, usually fixed, costs, where both performative activity and creative activity are present. But, unlike creative incubators, the creative center does not provide significant multi-dimensional background for entrepreneurs and startups like direct investments, management or marketing support (Landry, 2012; Ponzini, 2010; Boix et al., 2015; Slach et al., 2013; Žáková, 2015; Kloudová, 2013; Marková et al., 2013).

3.   Methodology and data

Presently there is no publicly available official list of the institutionalized creative centers located in the Czech Republic and, there is no widely used method of approach to create one. In the past, we have had a good experience using the methodology inspired by the research focused on mapping the business incubators phenomena in Czechia (Andera and Lukeš, 2016).

At first, we have contacted the team around the government-funded project "Kreativní Česko" since we knew that one of their tasks is to explore and describe creative industries in the Czech Republic. The non-existence of an official list of institutionalized creative centers was confirmed. We have received some tips which, for example, contributed to a more precisely compiled list of keywords used for online research. A search via the google.com and anopress.cz web search engines was performed using the keywords "kreativní centrum" (creative center), "kreativní inkubátor" (creative incubator), "kreativní hub" (creative hub), "kulturní centrum" (cultural center) and "kreativní klastr" (creative cluster) with a limitation on Czech websites. Each center was subsequently individually checked, and if it met the characteristics of a creative center as defined above, the information about the date of establishment, location, and type of ownership was added. References to activities of the majority of the organizations can be found in media archives, and a majority of them provide information to the public via social media as well as websites. By the location and the date of establishment, the centers were categorized in regions, districts, and time periods. Based on their own description, some centers were rejected, in many cases because they are a culture centers entitled as creative centers.

After a search was finished and its results described and evaluated, a correlation analysis was employed to find out whether there is an existing relationship between the density of creative industries and the distribution of creative centers both on regional and district levels. The main goal of this analysis was to confirm the idea that creative industries, or more specifically, creative clusters, have a strong tendency to support further creative industries development in the location where they are situated, for example, development in the form of creative centers. From this perspective, there is a strong expectation that the creative centers should be primarily established in the locations with the highest presence of creative industries (Boix et al., 2015; Kloudová, 2010). It is important to explore this relationship in the area of Czech Republic both on regional and district level because it will provide more detailed picture of current situation and point out, which regions or districts, next to Prague, Brno, etc., should expect a creative centers spread and which needs more support.

The first variable, the number of creative centers present in the region, or district, was a result of the first part of the research as described above. The second variable chosen was a location quotient of the creative industries of the area. It was retrieved from a 2013 published study that was focused on a spatial perspective of creative industries in the Czech Republic. The location quotient represents a ratio between the percentage of employment in the creative industries in the selected area and a percentage of overall employment in creative industries in

the Czech Republic. This ratio reaches values from the lowest 0.13 to the highest 3.04 (Slach et al., 2013; CSO, 2019).

4.   Results

The online research brought better insight into the past and current state of creative centers in the Czech Republic, especially from the perspective of time development. Slightly surprisingly, the first found creative center was established in 1999. It was situated in a former fortress of Terezin in Ústí Region, district Litoměřice. A location quotient of creative industries of this region is second lowest and, of course, under the average of Czech Republic, and the Litoměřice district location quotient of creative industries is only slightly above the average of the Czech Republic.

Fig. 1: Origin of creative centers from the perspective of time and ownership
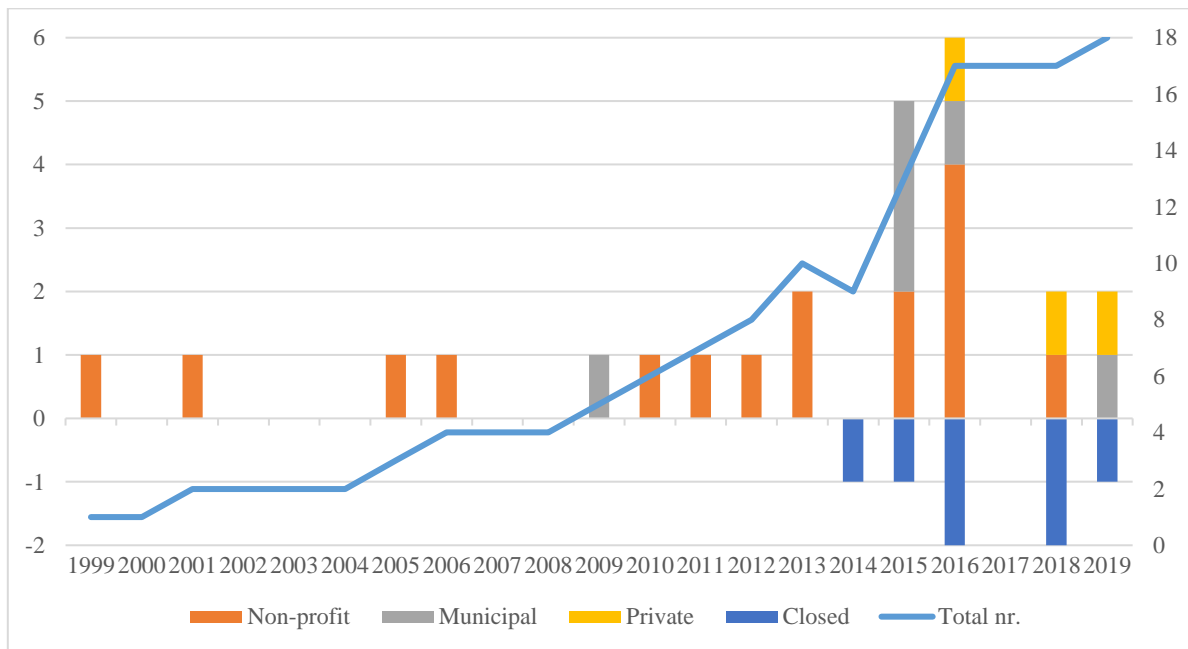
Source: Author.

The regional distribution of creative centers clearly shows the tendency to establish the centers in main regional cities or their near surroundings. That itself might be considered as a confirmation of the opinion that creative industries are cluster-based and if there is a strong presence of creative industries in the area, there is expected further development of local creative industries, establishing new creative centers included (Porter, 1998; Landry, 2000; Slach et al., 2013). The vast majority (12) of the centers is in Prague, followed by the South Moravian Region (4), West Bohemia Region (2), and Moravian-Silesian Region (2). There is, or was, no creative center in 6 Regions of the Czech Republic.

Fig. 2: Regional distribution of creative centers and location quotient of creative industries in the Czech Republic
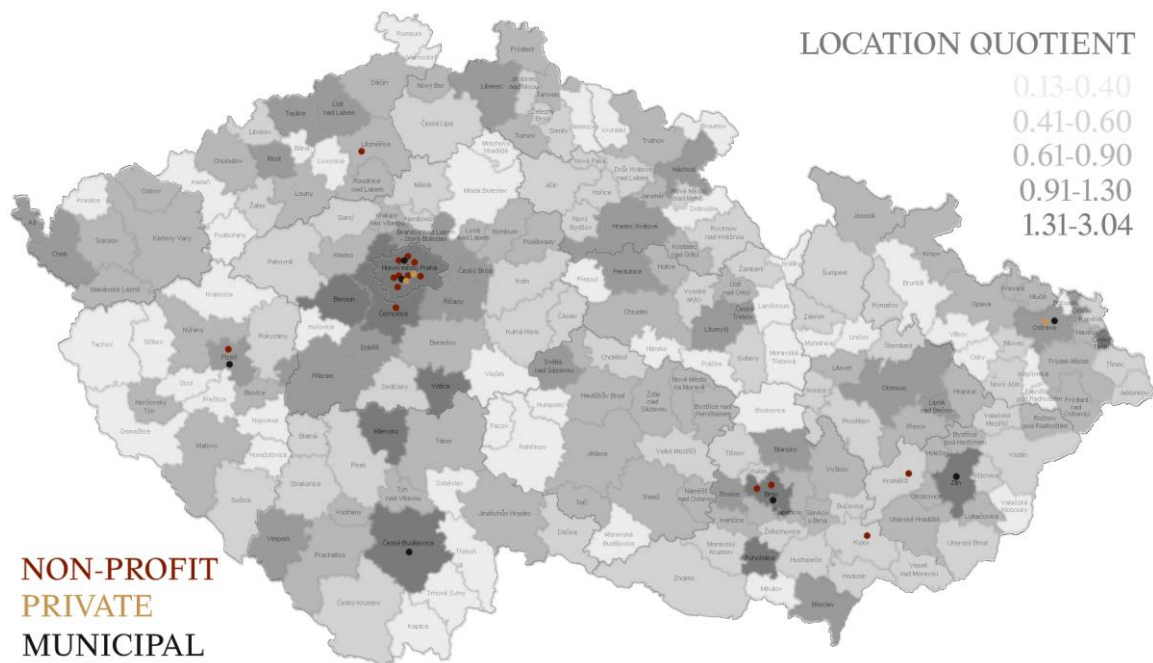
Source: CSO (2019), Slach et al. (2013), Author.

An interesting fact is that only one center established before 2015 defines itself as creative, while half of the creative centers established after 2015 does accent the aspect of creativity, in some cases even in their title. Raising creative centers awareness might be impacted by the city of Pilsen being chosen as the European capital of culture 2015. This success also was a kind of impulse for the state, regional, and municipal governments to invest in creative centers. The awareness of the term "creative center" is still obviously not very high, and therefore there is a strong need for legislative definition, especially for subsidy programs. As stated before, creative centers are existentially unstable, which discourages private investors, so they are a domain of non-profit organizations with experience and abilities to ensure sufficient multi-source funding, which is highly dependent on subsidies (Marková et al., 2013).

The visualized regional distribution of creative centers on the background of the density of creative industries in districts of the Czech Republic might suggest that there is a correlation between these two variables. To explore this, we have decided to employ simple Pearson Correlation using obtained data concerning the regional distribution of creative centers and data, which were used for graphic visualization with the expansion of location quotients on a regional level. There is a strong positive correlation between both variables on a regional level (rho=0.8861, P=0.000025, N=14) and a weak positive correlation on the level of districts (rho=0.2835, P=0.000036, N=206). The validity of this result is limited by a relatively small

overall number of creative centers in diverse districts and, at the same time, the leading role of Prague as both region and district. Yet it is possible to confirm the cluster-oriented nature of culture industries and their tendency of further development, in this case, represented by creative centers, in the areas with a high density of already present creative industries.

Conclusion

The research succeeded in creating the first list of creative centers in the territory of the Czech Republic. Only one creative center established before 2015 defines itself as an actual creative center, which might lead us to think that there is a possibility that the list may not cover all the institutionalized creative centers, especially those that were first of its kind. A weak point may be that the research relies heavily on public-available data, but, in all cases, the creative centers are public and very open in providing information. Some may also question the validity because of the possible empirical bias – we guess that the definition of the creative center, as presented in the theoretical part of this paper, basically denies any misguidance during the research, at least for persons with a general insight on the topic.

The creative center phenomenon has a pretty long history in the Czech Republic, yet only a relatively small number of centers were established to this day, namely 25. The regional distribution points to the dominance of Prague and South Moravia Region with the tendency to concentrate in main regional cities like Prague, Brno, Pilsen, Zlin, Ostrava, etc., albeit the first creative center was established in 1999 in the former fortress Terezin in Ústí Region. In the period between 1999 and 2014, the rate of establishing creative centers was slower than one established creative center per year. That changed in 2015, possibly in the context of aspiration of several cities to become European capital city of culture of 2015, when five centers, from which three were municipal, were established. The following year there were six centers established.

The finalized list was used to answer the question, whether the regional or district density of creative industries impacts the geographic distribution of creative centers. The cluster-oriented nature of culture industries and their tendency of further development of the areas with a high density of already present creative industries was confirmed in the case of the Czech Republic. There is a strong positive correlation between both variables on a regional level and a weak positive correlation on the level of districts.

The process of compiling the list provided a lot of thoughts and impulses for further research of creative centers in the Czech Republic, for example concerning the state of the national awareness of the phenomenon, creative centers role in the Czech society, measuring

creative centers activity and performance, benchmarking, etc. It also raised a question whether the Czech creative centers, founded using a top-down approach, share common issues like in foreign countries, for example, disbalance between the founders and original community or the present community itself, commercialization, etc. (Li and Liu, 2019). Besides that, the list of institutionalized creative centers in the Czech Republic can be used for future comparisons, and to measure the impact of upcoming expected government support.

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