

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

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## Abstract

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

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

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

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

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

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

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

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## Introduction

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

When it comes to previously published studies, Mezera et al. (2014) provided an overview of public funding sources in the Czech food industry and they also evaluated profitability and investment activities of publicly supported and unsupported food enterprises in years 2007 and 2012. The authors found out that the economic effects of public interventions were not significant, more concretely, the positive impact of the financial aid on profitability indicators of the supported enterprises, was not confirmed. Different results were published by Mezera and Špička (2013), who evaluated the public support through an added value to food products, in the framework of the Rural Development Programme. Their analysis has shown the positive impact of investment support on financial stability of the supported enterprises. Significant benefits of public support in the Czech agribusiness sector and productivity improvements were confirmed also by Medonos et al. (2012), who conducted quantitative survey of 20 farms which received investment support between years 2008 and 2010. Ratinger et al. (2014) evaluated selected measures<sup>1</sup> under the Rural Development Programme during the period of years 2007-2013 and he concluded that, in general, the selected measures

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<sup>1</sup> Modernisation of agricultural holdings and adding value to agricultural and food products.

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

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

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

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

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

In this study, we are interested in the outcomes of the programme on the financial performance of the Czech food processing firms. According to NACE classification, the Czech food processing industry consists of the activities CZ-NACE 101 – CZ-NACE 110<sup>2</sup>. Table 1 informs reader about the activities of the supported firms in the sector, and also about the number of supported companies/projects in each of the category. From Table 1, one can observe that supported companies received subsidies mainly on new technologies, efficient use of energy and on investments in real estates or on building of production capacities.

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

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

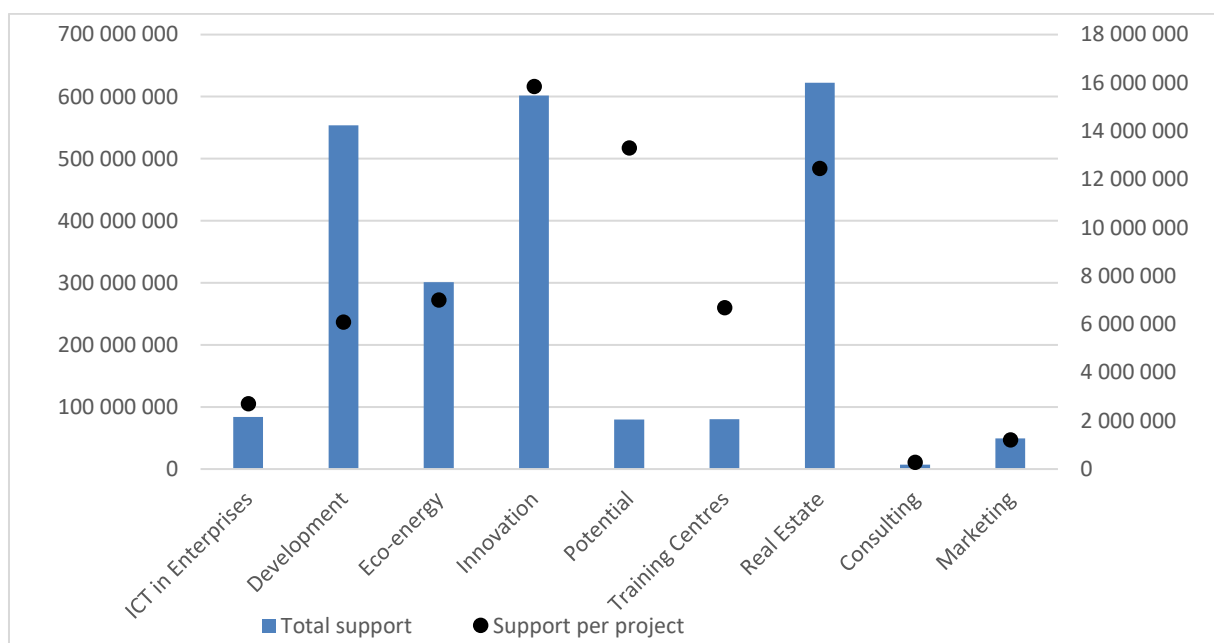
Source: Czech Invest (2017); author's elaboration

<sup>2</sup> CZ-NACE 101: Production, processing, preserving of meat and meat products; CZ-NACE 102: Processing and preserving of fish and fish products; CZ-NACE 103: Processing and preserving of fruit and vegetables; CZ-NACE 104: Manufacture of vegetable and animal oils and fats; CZ-NACE 105: Manufacture of dairy products; CZ-NACE 106: Manufacture of grain mill products, starches and starch products; CZ-NACE 107: Manufacture of bakery and farinaceous products; CZ-NACE 108: Manufacture of other food products; CZ-NACE 109: Manufacture of prepared animal feeds; CZ-NACE 110: Manufacture of beverages.

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

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

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



Source: CzechInvest (2017); author's elaboration

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

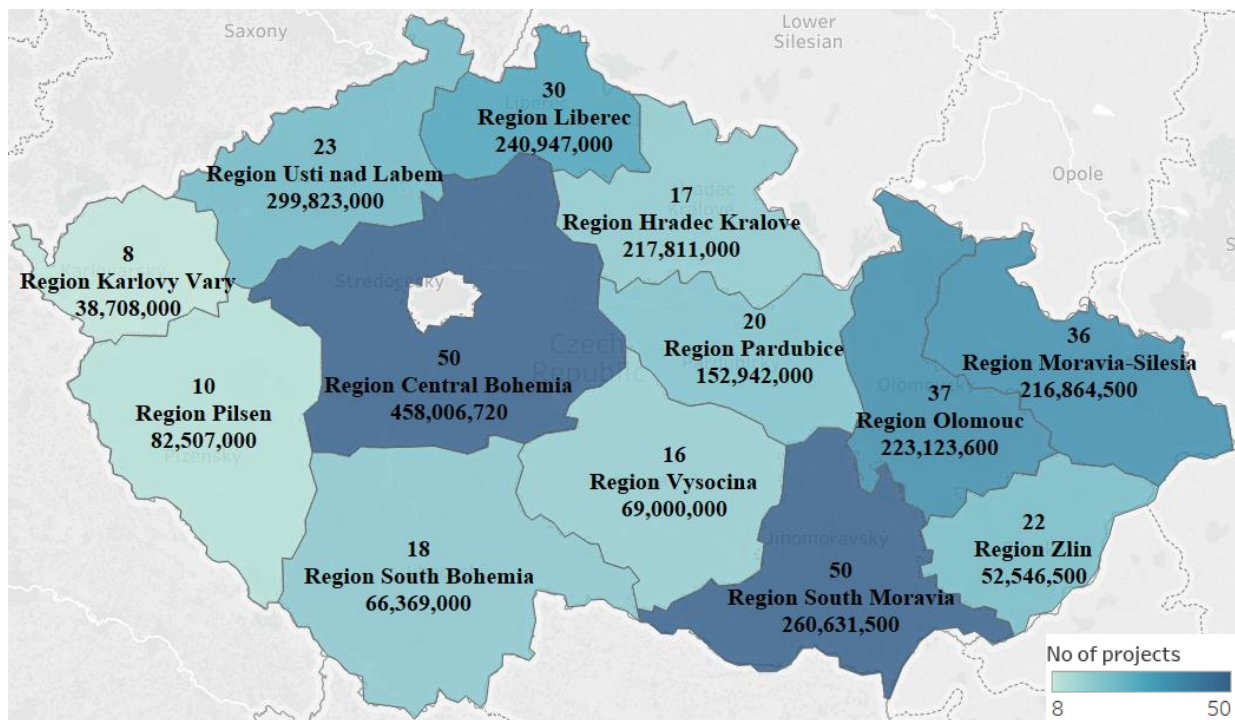
**Tab. 2: Support Programmes within OPEI in the Czech Food Processing Industry**

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

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

As documented in Figure 2, the highest number of supported projects was implemented in the Region South Moravia and in the Central Bohemia Region (50 projects). The Region South Moravia is generally considered as an important centre of R&D (Blažková, 2016), which is confirmed by the fact that the majority of supported projects in this region falls into the Development programme. However, the total funds paid to the food firms in this region (260,632 ths. CZK) are lower than in Central Bohemia region (458,007 ths. CZK), which gives evidence about lower financial demands of the supported projects in the Region South Moravia. On the other hand, the regions with the lowest activity within the OPEI are the Region Karlovy Vary (8 projects) and the Region Pilsen (10 projects).

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



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

## 2 Data and Empirical Results

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

values. Based on the database of the CzechInvest (2017) we have identified 203 firms participating on the OPEI support. Due to the fact that some business have received support for more projects, the number of supported projects is larger - 337. Our efforts resulted in having financial data for 140 supported companies, accounting for 69% of the programme participants within the sector.

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

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

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

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

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



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

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

Source: STATA 14, author's elaboration

## Conclusion

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

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

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