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Electronics Industry: R&D investments as Possible Factors of Firms Competitiveness

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Abstract

This paper aims at the impact of R&D investments on economic stability in the Czech enterprises. The authors study relationships between R&D investments and financial indicators and ratios for period 2007–2014. The empirical analysis is based on a sample of 103 Czech electronic industries innovative enterprises with R&D investments during the period 2007–2013. The paper deals with the hypothesis that R&D investments are utilized to increase economic efficiency. The second hypothesis is represented by an idea that enterprises invest systematically to be able to cope better with the effects of depressions. Financial indicators are analyzed and presented with the aim to verify these hypotheses.

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Keywords: Electronic industry; efficiency of firm; profitability ratio; structure ratio; R&D Investment

1. Introduction

In developed and developing economies is generally accepted an opinion that investment in research and development (R&D) is essential for the growth of the economy as a whole and at the same time it is an important factor for improving the performance, efficiency and competitiveness. The own innovative potential of enterprises, R&D cooperation and public R&D support in the EU are considered to be a suitable stimulant for the development of regions. Empirical studies made in Germany analysing data of 270 regions (from the total 295 regions) showed that innovative collaboration and public support for R&D investment are suitable policy measures to stimulate innovation

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performance of regions (Broekel, 2015). The comparison of innovation active enterprises with so-called young highly innovative enterprises (Young innovative companies – YICS) in Germany showed that YICS among innovative companies are rare, but had significantly higher revenues from innovative sales. And this is despite the fact that R&D funding from their own resources of YICS is an important factor preventing from wider development of innovative activities. Connection with the growth of the innovation performance of public funds subsidized YICS compared with other innovative companies in German sample has not been proved (Schneider & Veugelers, 2010). In the study there was not demonstrated a significant effect of R&D investment for SMEs on capital investment and turnover growth. In the manufacturing industry there was a positive relationship between R&D activities and growth of the company. For parts with a low proportion of advanced technologies there was not found a positive effect, while somewhere it was also mentioned a negative trend (Schinke & Brenner, 2014). The focus of European policy on innovative SMEs and the impact of R&D support for output in the form of patents were studied in young innovative SMEs in the field of high-tech in Germany in the period 1994–2006. The effect of subsidies from public funds was most evident in the independent high tech SMEs. Independent high-tech companies did not have lower performance than independent low-tech SMEs and dependent – acting in clusters and the policy of funding R&D activities was effective in Germany (Czarnitzki & Delanote, 2015). Competitiveness and R&D investments are also linked with a skilled workforce. The Effects of innovation on firm growth in terms of employment growth was examined in Taiwan. Yang and Lin scientific findings are that innovations, measured by R&D investments and patent counts, have a positive impact on firm growth (Yang & Lin, 2007). Results of empirical study in the global electronics industry showed that firms spending more on R&D have higher gross profit, but do not have higher return on equity (ROE) and return on assets (ROA). The findings suggest that relationship of R&D to performance is mixed (Shin, Kraemer & Dedrick, 2009). Results of Korean analysis showed that R&D intensity does not affect either environmental responsibility or corporate financial performance. But the authors showed that the relationships between environmental responsibility performance and firms' ROE and ROA are positive and statistically significant (Lee, Cin & Lee).

Foreign economic literature deals mostly with examining the impact of R&D and innovation on business performance across the entire industry. The article focused on innovative companies based in the Czech Republic evaluating only one chapter the manufacturing industry. The chapter CZ-NACE 26 Manufacture of computers, electronic and optical products and equipment is among the most important chapters of the manufacturing industry. Electronics industry is one of the greatest industrial sectors in the world and it has still great potential in EU. On the other side it is besides manufacturing industry the sector the most affected by the world depression. The crisis caused a significant drop of production, sales, employment and other economic indicators (MIT, 2013). It is an important supplier to other industries, particularly the automotive industry and mechanical engineering. The products of the electrical industry are used practically in all spheres of human activities and their life cycles are getting always shorter. The production belongs to the category of high and medium-high technology. The chapter includes, on the one hand, labour-intensive production and on the other hand, the highly productive automated production.

The chapter includes the production of consumer electronics, measuring, testing, navigating and control equipment, irradiation, electro medicine and electrotherapeutic equipment, optical instruments and equipment and manufacture of magnetic and optical media. (MIT, 2015) It also is a chapter that is the most involved in the global value chains of multinational companies where the segmentation of activities is supposed to keep the R&D within the jurisdiction of the parent company with a higher knowledge level of employees. The own production and assembly is done in less economically developed countries. The chapter of CZ NACE 26 is characterized by high import intensity of exports (year 2014: 1 CZK of export was 0.79 CZK of import) in the manufacturing industry. This implies high sensitivity of the chapter to economic fluctuations and crisis phenomena. According to revenues, the chapter CZ NACE 26 is in 4th place in the manufacturing industry. The objective of the contribution is to analyse the differences in efficiency of companies investing in R&D regularly and efficiency of companies investing occasionally. The second aim is to compare the economic results of the both groups of enterprises with the whole sector of manufacturing industry and find how the innovative enterprises faced the depression and the period of economic stagnation which followed.

2. Methodology and data

The research itself was done among the Czech manufacturing companies of the chapter branch NACE 26 within the section C – Manufacturing industry. From the database of the Czech Statistical Office (CZSO) were obtained data