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Changes in the Rate of Investments in the Czech and Slovak Republics and in High-Tech Manufacturing Industry of Both Countries

Abstract

Competitiveness of the Czech Republic and the Slovak Republic is affected by the use of resources that are available. Neither country has a large area, nor raw-material potential and only a reasonable tourist attraction. Competitive advantage is a need to be built on other sources. The starting point for the economy and most companies is to find a position in customer-supplier chain, which provides high added value.

Macroeconomic competitiveness can be based on quantitative factors (low material and labor costs) or qualitative factors. Qualitatively based competitive advantage must be continuously supported by investments, therefore it is often related to a relatively high investment rate.

Years 2008 – 2010 are and will be associated with the effects of the global economic crisis, which has the consequence of reducing expenditures. Companies reduce costs, particularly where it was possible, significant and did not have an immediate impact. Capital expenditures were thus one of the first items restrained. This article aims to analyze the situation in the economy, which is both very important for the competitiveness of the Czech and Slovak Republics and very sensitive to the need for continuous inflow of investment. The chosen branch is the high tech manufacturing industry.

This paper analyzes the status and development in high-tech manufacturing in years 2008 – 2010 and provides spatial and trend comparison (development is compared in the Czech Republic, the Slovak Republic and the EU-27 average). Indicators compared in the article are relative measures, in order to keep comparability correct.

Article also compares different developments of companies depending on the type of ownership (domestic or foreign owner) and size of the company (small, medium, large). Article seeks to highlight the strengths and weaknesses in needs and assessing of companies, so that they can eventually be purposefully supported in order to get a direct impact on economic growth.

Key Words

rate of investment, gross fixed capital formation, high-tech sector, manufacturing industry

JEL Classification: E22, D21, D24, L60, M21

Introduction

The natural reaction of companies on the economic crisis is to reduce costs and thus reduce investment spending. Instantaneous competitiveness of companies can be seen

in sales (or value added.) Long-term competitiveness of companies and higher performance of economy is conditioned by increasing the investment spending (i.e. gross fixed capital formation). Indicator Investment rate connects capital expenditure with the power companies. At the macroeconomic level it indicates future economic performance. In conditions of the economic crisis, investment rate in the Czech Republic and in the Slovak Republic has fallen, but this indicator has been developing differently since 2010 in the two countries. The decline in investment rate in the Czech Republic is considered to be a negative signal for the future competitiveness of the Czech economy. Analysis at the level of a specific sector can identify concrete factors that participate in the development at the macroeconomic level. This analysis examines the investment behavior of companies in sectors important to the future competitiveness of the economies – in high-tech manufacturing sector. Our analysis shows the different impact of the economic crisis on the rate of investment companies by size and ownership. The analysis also allows to identify the changes inside the sector and also the different adaptation companies on crisis conditions.

1. The impact of economic crisis on the gross fixed capital formation and the rate of investment

The decline in investments in companies at the macroeconomic level is reflected in the national accounts in the change in gross fixed capital formation. In the table 1, we use data from Eurostat (EUR million, current prices) and we present the annual change.

Tab. 1 Gross fixed capital formation (annual change in %)

	2006	2007	2008	2009	2010	2011	2012
Czech Republic	12.3	17.4	15.9	-15.2	5.3	1.1	-1.7
Slovak Republic	15.5	21.6	11.3	-18.5	6.4	15.2	-0.8
EU-27	9.4	9.3	0.5	-15.3	2.1	3.2	-1.5

Source: own processing by [7]

The data in Table 1 show that the investment activity in the Czech Republic and Slovakia in comparison with the EU-27 higher than average. Annual increase of gross fixed capital formation was almost double in the Czech Republic after joining the EU and even more than double in the Slovak Republic than the average growth rate of investment in the EU-27. The economic crisis has caused not only a significant slump in gross fixed capital formation (GFCF) in both countries, but also a significant drop in inventory production. In 2009 the gross capital formation (GCF) decreased by 19.5 % in the Czech Republic, while gross fixed capital formation decreased by 10.2 %. Even the Slovak Republic has registered bigger drop in GCF for the same reason – a huge reduction in inventory. GCF has fallen in the Slovak Republic by 32.5 % year on year, GFCF decline was 21.5 %. The following table 2 shows that in the Slovak Republic, which has moderate economic growth since 2010, the GFCF almost returned to pre-crisis levels (GFCF in 2012 was only 0.9 % lower than in 2008). Czech economy is the only country in the region, which in

2012 suffered a recession [11] – investment activity of companies in this year was, unlike in Slovakia, significantly lower than the pre-crisis year 2008, by 11.3 %.

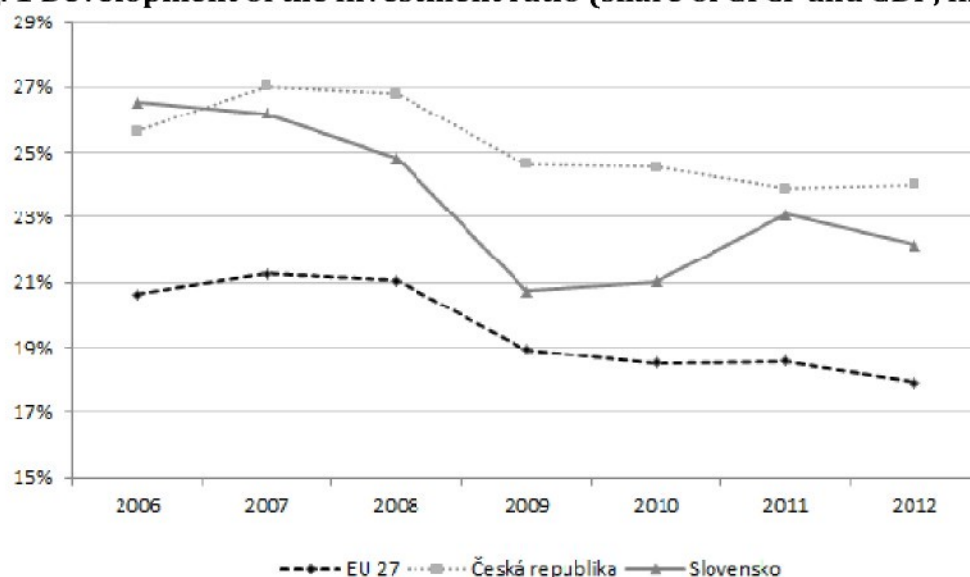
Tab. 2 Gross fixed capital formation (in billions of EUR, at current prices)

	2006	2007	2008	2009	2010	2011	2012
Czech Republic	30.3	35.6	41.3	35.0	36.9	37.3	36.7
Slovak Republic	11.8	14.4	16.0	13.0	13.9	16.0	15.8
EU-27	2413.7	2638.2	2626.0	2225.2	2272.6	2345.8	2311.3

Source: own processing by [7]

The persistent structure of the Czech and Slovak economies (i.e. above-average share of manufacturing industry in the gross value added in the economy, compared with the average for the EU-27) is reflected in a higher rate of investment compared to the average of this indicator for the EU 27.

Fig. 1 Development of the investment ratio (share of GFCF and GDP, in %)



Source: own processing by [7]

Figure 1 shows the negative impact of the recession on the rate of investment in the Czech economy in 2012. Investment rate in the Czech Republic (after dropping in 2009) decreased slightly. In the Slovak Republic, which reported GDP growth after the recession in 2009, the investment rate has increased. Depth of the yearly decline in industrial production in 2012 in the Czech Republic (according to [3] and [4]) has not reached the level of the EU (-2.1 %) and is located close to Germany and Hungary (-0.8 %). The Slovak Republic, which still benefits from completing the expansion of the automotive industry, the industry grew by 10 %. While last year's production of Czech industrial enterprises was located at the level of 2007, Slovakia exceeded the level of pre-recession by ¼. [4]

2. The position high-tech manufacturing industry as part of the manufacturing industry in the Czech Republic and the Slovak Republic

To redirect our economy competitive advantages from cost-orientation to qualitative competitive advantage, innovation performance of firms is a key prerequisite in the high-tech sector. High-tech sector is defined as a set of economic activities for whose production advanced technologies are widely used. At the same time the development of such activities accompanies the high cost of innovation or research and development (R&D). These economic activities also generate higher added value. High-tech sector in the Czech Republic and in the Slovak Republic is defined through Classification of Economic Activities (CZ-NACE, SK/NACE) [1, 8] and is divided into two main categories: high-tech manufacturing and high tech services. High-tech manufacturing industry includes the following activities: manufacture of pharmaceutical products and preparations, manufacture of computers and electronic components, production of consumer electronics and optical equipment, manufacture of measuring, testing, navigating and medical equipment, manufacture of aircrafts and spacecrafts and their equipment. [1, 8]

The first reference period for data processing with the new CZ-NACE and SK-NACE was 2008. While CSO also allows you to monitor data for 2005 – 2007 through reverse conversion of structural data, Slovak Statistical Office only publishes data since 2008. In the following analysis of the rate of investment in high-tech sector, we therefore start from the available data for both countries. This data will allow us to monitor the impact of the economic crisis on conduct of companies in high-tech manufacturing sector in both countries, according to the owner and size.

During the analysis period (2008 – 2010) the position of the high-tech manufacturing industries in the manufacturing industry (MI) is stable (see Fig. 1). Employees of high-tech manufacturing industry accounted for approximately 5 % of the CR staff throughout the manufacturing industry, the share of high-tech MI in sales of MI (sales of own products and services) did not significantly change even in 2009 and has an average of 12 % in the period. The increase in the share of high-tech MI by 1 pp in 2009 caused by lower decline of revenues than in MI (MI recorded revenues decline by 20 %, sales in the high tech MI decreased only by 12 %) and can be regarded as evidence of greater adaptability and competitiveness of the sector in crisis conditions . A similar conclusion follows from the data on the development and sales of MI and high-tech MI in the Slovak Republic. Advanced technology shows a 13 percent revenue share on average for the period. The increase in the share of high-tech MI by 4 pp in 2009 is caused by the decrease in MI sales (down 25 %), while sales of high-tech MI grew by 2.2 %. Even in the case of Slovakia, this result can be regarded as a manifestation of a greater adaptability to crisis conditions. It is also possible to say that the adoption of the Euro had a positive effect on the sales of high-tech MI in the Slovak Republic.

Tab. 3 The position of high-tech manufacturing industries in the manufacturing sector (the share of high-tech MI to MI)

	Czech Republic			Slovakia		
	2008	2009	2010	2008	2009	2010
Labor productivity (from revenues)	2.01	2.24	2.39	2.38	2.47	3.17
Staff	6 %	6 %	5 %	5 %	5 %	5 %

Note: Revenues from own production and sale of goods in current prices in CZK and EUR

Source: [1, 2, 8, 9]

Table 3 shows that the position of high-tech MI in employment in the MI in both countries is stable. Due to the fact that in both countries the number of employed in MI and high-tech MI decreases (see Fig. 4), the absolute decline in the number of employees in the MI and high-tech MI is uniform. Labor productivity (measured as a share of sales of own products and services and the average registered number of employees) in the high-tech MI more than doubled in both countries. The cause of significant differences in labor productivity is mainly the difference between firms with domestic and foreign owners. Immediately after the introduction of investment incentives, this difference was associated with the effects of foreign direct investment for both economies (the rate of technological flow is conditioned by the ability of domestic firms to absorb these new technologies). In times of crisis it is possible to associate this difference with the fact that the foreign owner due to its position in the value chain and the supplier-customer relations achieves higher market prices than firms with domestic owner. [6]

This view is supported by the following Table 4.

Tab. 4 The position of foreign affiliates in the HT MI (share in %)

	Czech Republic			Slovakia		
	2008	2009	2010	2008	2009	2010
Staff	68.3	70.0	61.3	73.9	79.8	80.9
Value added	73.6	70.8	59.0	89.9	82.3	92.0
Sales of own products and goods	84.7	90.8	87.4	95.8	97.3	96.8

Note: The value added and sales in bc in CZK and EUR

Source: [1, 8]

Table 4 confirms the above mentioned argument about the position of foreign affiliates in the value chain and the supplier – customer relationships. The share of foreign affiliates in value added in the crisis year of 2009 decreased (in the Czech Republic it also fell the following year – in connection with a decline in the number of large foreign-owned companies in the sector), their share of sales increased. It may mean maintaining access to markets, but at the cost of less effective pricing policy. Another reason may be the more effective management of operating costs.

The higher share of foreign affiliates on the Slovak high-tech manufacturing industry can be explained by the different phases of the life cycle of investments in connection with subsequent massive influx of Foreign Direct Investment (FDI) and the influence of the common currency, which deprives the investor's risk of changes in the exchange rate.

Table 5 shows the annual change in labor productivity and the number of employees in high-tech manufacturing industry and manufacturing industry and describes the impact

of the economic crisis on the environment and high-tech manufacturing industry in both countries.

Tab. 5 Annual change in the labor productivity and the number of employees in the MI and HT MI (in %)

	Czech Republic		Slovakia	
	2008/2009	2009/2010	2008/2009	2009/2010
Labor productivity (MI)	-10.2	+ 25.5	-8.4	+14.7
Labor productivity (HT MI)	+ 1.8	+22.3	+5.3	+15.4
Staff (MI)	-12.5	-2.4	-16.0	-13.8
Staff (HT MI)	-13.4	-8.7	-3.0	-7.8

Note: Labor productivity = revenues from sales of own products and merchandise to employees at current prices in CZK and EUR

Source: [1, 2, 6, 8, 9]

Better adaptability of high-tech MI companies to crisis conditions is evident from the annual changes in labor productivity. In manufacturing, labor productivity declined, high-tech manufacturing industry had a positive impact on the performance of both economies in 2009.

The increase of productivity in high-tech industries in the Czech Republic was supported by a larger decrease in employees than the decline in sales.

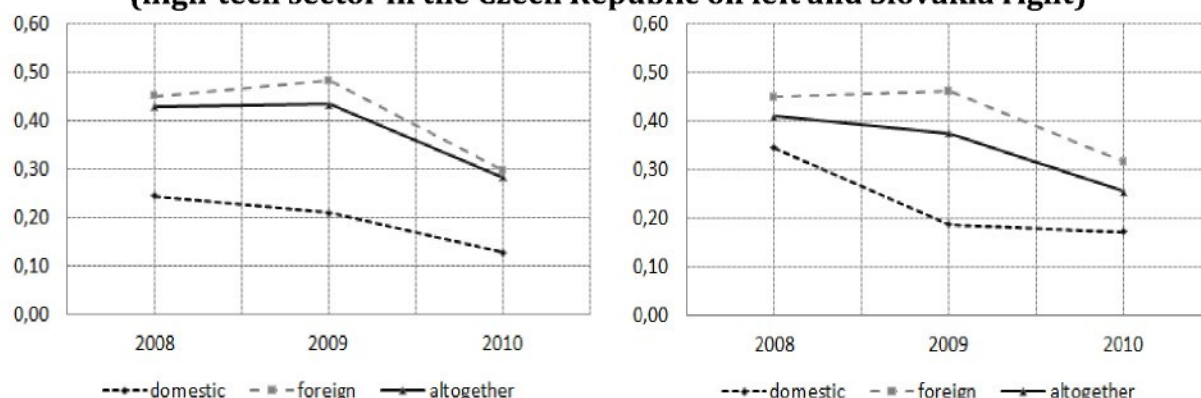
In Slovakia sales increased, although there was a drop of the number of employees (we remind again of the positive effect of EUR – in the form of elimination of transaction costs and exchange rate risks). Recovery, which both economies showed in 2010, led to an increase in sales in both countries with further decline in employment. The result is quite significant annual increase in labor productivity.

3. Changes in the rate of investment in high-tech MI during 2008 – 2010

The development of capital expenditures during this period confirms the fact that these expenditures are the most volatile item of expenditures at the macroeconomic level. Our analysis provides a more detailed view of the changes in the rate of investment in the sector, which is crucial for the future competitiveness of both economies. Differences in rate of investments between firms with domestic and foreign owners and between small, medium and large companies make it possible to identify the different reaction of these companies to the economic crisis.

Figure 2 illustrates the evolution of the investment rate in high-tech MI by the owner, figure 3 the evolution of investment in high-tech companies MI by size.

**Fig. 2 The rate of investment by owner
(high-tech sector in the Czech Republic on left and Slovakia right)**



Note: The investment rate = gross expenditure on investment / value added, in current prices (CZK, EUR)

Source: [1, 8]

Companies with foreign owners show a higher rate of investment in both countries, and in the Slovak Republic, the share of foreign affiliates in investments in high-tech ZP is higher than in the Czech Republic. Companies reacted to the economic crisis by decline in investment spending.

Because the value added in the Czech firms with domestic owner dropped less, decline in the rate of investment is quite significant. How to explain the slight increase in the rate of investments in foreign affiliates in the Czech Republic and Slovakia? The fall in value added was almost 2 percentage points greater than the decline in investment spending in the Czech Republic (4 percentage points in Slovakia).

Among the companies with home owners, small and medium enterprises dominate in both countries, whose response to the decline in orders is more flexible than large firms. Deciding on investment is not trivial, and if the company is large or has a complicated decision-making structure (foreign affiliates), then there is a rather slow response to the current internal and external conditions. [6]

HT MI contributed with a more significant decline in investment spending (by 33 %) than the decline in value added (by 2 %) to a relatively sharp decline in the rate of investments in 2010 by foreign affiliates in the Czech Republic. Slovak foreign affiliates increased year on year as added value (by 164 %), a capital expenditure (62.5 %) – a decline in investment rates was therefore due to lower growth in capital expenditure compared to the growth in value added.

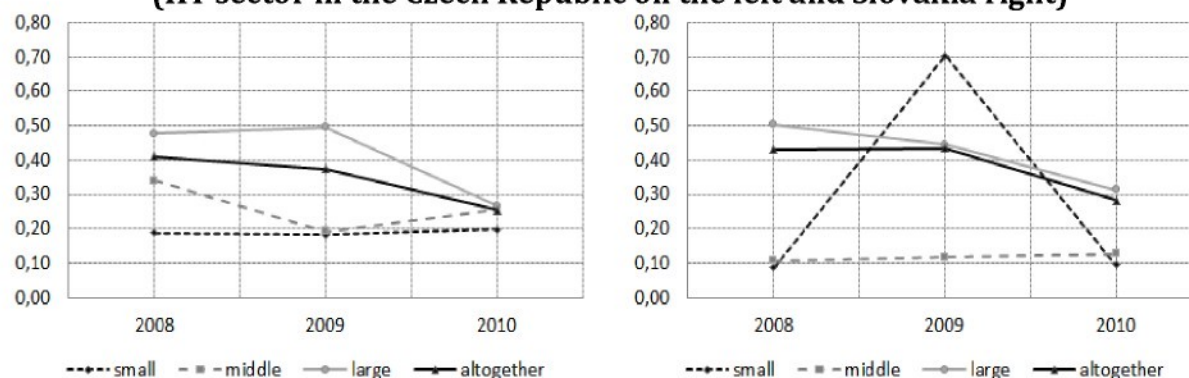
In times of crisis, companies with domestic owners in the Czech Republic reduced capital expenditures more (by 53 %) than value added (by 14 %). In 2010 there was an increase in capital expenditures and value added, but greater value added growth (by 75 %, capital expenditure increased by 60 %) had a negative impact of investments rate.

Companies with domestic owners in Slovakia decreased capital expenditure (in 2009 to 10 % in 2010 to 35 % over the previous year), while the value added grew slightly (5 % and 7 %).

Given the significant share of big companies with foreign ownership in the sector, average investment rate follows the rate of investment in large companies. Significant difference between large firms and Czech average is explained by a smaller proportion of large firms with foreign ownership in comparison with Slovakia (see Table 6). Approaching between the average investment rate and the rate of investment in large firms is due to the increase in the rate of investment in medium-sized companies. In 2009, capital expenditures decreased in all companies (the least, i.e. annually by 16 %, in small companies).

The different developments in the rate of investment was caused by a different drop of value added (the smallest, or 3 %, were in medium-sized companies). In 2010, capital expenditures decreased only in large companies (by 35 %), value added increased in all companies. In Slovakia, there is a positive evolution of investment rate in small businesses with home owners due to the increase in their number in the sector and one-time capital expenditures in this segment.

**Fig. 3 The rate of investment by firm size
(HT sector in the Czech Republic on the left and Slovakia right)**



Note: The investment rate = gross expenditure on investment / value added, in current prices (CZK, EUR)

Source: [1, 8]

For other companies, the value added decreased more than decreased capital expenditures in the crisis year. In 2010, the annual decline in investment spending (89 %), which was greater than the decline in value added (18 %), participated in the sharp decline in investment rates in small firms. The growth of investment rate in medium-sized enterprises was due to a higher increase in spending on investments (45 %) than the increase in value added (33 %). Decrease in rate of investments of large companies operating in the Slovak HT MI is accompanied by a higher increase in value added (about 201 %) compared with the increase in value added in the Czech Republic (by 112 %).

Conclusion

The aim of the article was to analyze the situation in the part of economy, which is both very important for the competitiveness of the Czech and Slovak Republics and very sensitive to the need for continuous inflow of investment. This industry is high tech

manufacturing industry. Article analyzed developments in high tech manufacturing in the years 2008 – 2010. Comparison of the development and status of the Slovak and EU-27 showed other aspects of the problem. The indicators are relative terms to the comparability correct.

The comparison is a different development in companies depending on the type of owner (owner domestic or foreign affiliates), and size of the company (small, medium, large). The article shows the strengths and weaknesses in needs and appreciation of companies so that they can be purposefully supported with the direct impact on economic growth.

Analysis of selected performance indicators of high tech sector in recession and recovery in the beginning shows the impact of the recession on the company, but also the sensitivity of large firms and foreign affiliates to market fluctuations. On the other hand, we can see both the stability of small and medium-sized domestic companies, but also the flexibility to respond to changing circumstances. When taking into account not only innovation, but perspective in terms of building competitive advantage and other aspects such as the development of human potential and employment in the domestic small and medium-sized firms, we see that these companies are comparable in value added and are not by an order of magnitude smaller employer than the large firms (those are 42 %). In case of any support for building competitive advantages in the Czech economy, support (whether direct or indirect) of domestic companies, particularly medium-sized, should be emphasized, because they have the potential to create product innovation and development of skilled labor.

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