

# The Reaction of Small and Medium-sized Industrial Enterprises on the Crisis Period

Tomáš Volek, Martina Novotná, Jan Krátoška

**Abstract:** *The article deals with the development of the economic situation of small and medium-sized industrial enterprises on the crisis period. The data source was Eurostat (National accounts) and the business database Albertina. The observed data were from the 7 year period (2008-2014). Analysis was focused on macroeconomic and macroeconomic point of view. It was found that the reaction of the various sectors to the crisis was different. Industry (group A2 - Medium Low and Low Technology) react very sensitively to the changes in real business cycle. During the financial crisis of 2009 there was a significant decrease in production (GVA). On the contrary, in the post-crisis years, performance of enterprises returned to the initial values.*

**Key words:** Industry · Crisis · SMEs · Performance

**JEL Classification:** M21 · D24 · J24

## 1 Introduction

Small and medium enterprises are an important part of national economy. Small and medium-sized businesses are often confronted with economics crisis of the economy. Their response to the crisis could be different from the reactions of large enterprises. The aim of this paper is to assess the response of SMEs to the economic crisis from the macroeconomic and microeconomic point of view.

Crisis of SMEs can be viewed from different perspectives. Separating the internal and external factors as well as separating those that arise and have an impact on technical and economic factors with those that are caused by personal, organizational and social factors (Löwhagen, 2015). The most important external factor for the past 10 year was the global financial crisis which hit most of European countries in 2009. The financial crisis has had a negative impact not only economic growth and unemployment (Sirůček and Pavelka, 2013), but also on the competitiveness of SMEs. Lawless, O'Connell and O'Toole (2015) have found that financial crisis had significant negative effects on SMEs performance, in particular firms investment, employment and indicators of financial distress. The effects were strongest for enterprises that were in the mid-lifecycle. The negative impact of the crisis was not on all small and medium-sized enterprises. The main importance here was the sector (branch). Enterprises operating in the industry were more affected than companies operating for example in waste management (Petráček and Leitmanová, 2013).

SMEs were generally more vulnerable in times of crisis for many reasons among which are:

- it is more difficult for them to downsize as they are already small;
- they are individually less diversified in their economic activities;
- they have a weaker financial structure (i.e. lower capitalisation);
- they have a lower or no credit rating;
- they are heavily dependent on credit and
- they have fewer financing options (OECD, 2009).

What are the possible responses to the crisis? Some companies do not react to the crisis. Other firms innovate and innovation give firms competitive advantage and enhance their evolutionary fitness (Makkonen et al., 2014). A significant role during the crisis played external and internal communications (Březinová and Vrchota, 2015). The evolution of competitiveness SMEs in crisis time depends on the ability to respond flexibly and proactively to the frequent changes (Pantilie, 2011).

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## 2 Methods

Sectoral division in terms of technological intensity were used for the analysis of response of SMEs on the crisis. Definition and classification of activities in economic activity in high-technology industries and knowledge-intensive services based on definitions created by the OECD on the basis of two or three levels of NACE (Eurostat indicators on High-tech industry and Knowledge - intensive services).

Based on this classification of economic activities are divided into 5 groups: A1 (Industrie: High and Medium High Technology), A2 (Industrie: Medium Low and Low Technology), B1 (Knowledge-intensive market services), B2 (Less knowledge-intensive market services), C (Agriculture, construction and utilities). Paper have analysed the crisis and post-crisis period firms in Group A2.

First attention was focused on the characteristics of a group of economic activities A2, especially regarding the impact of the global crisis on the basic economic characteristics ie. The development of value-added development costs of labour, development of investment activity measured as developing gross fixed capital formation and through ratios labour productivity (gross value added / compensation of employees), capital-labour ratio (compensation of employees / gross fixed capital formation). The source of data for this analysis was part of the national accounts -Eurostat.

Next part was assessed the development of SMEs in industry and the development of their performances in the years 2007-2012. The last part is focused on a particular enterprise in category of small and medium enterprises. The enterprise was chosen as a representative of group A2 and SMEs. This enterprise has illustrated a post crisis development.

For analysis of the contribution by groups of economic activities for the development of gross value added it is possible to use an additive ties between groups. The contribution of each of these groups is equal to the product of its growth rate (compare the intervals t-1) and the share of this sector in GVA interval t -1:

$$\left( \frac{GVA_{Si,t}}{GVA_{Si,t-1}} - 1 \right) * \frac{GVA_{Si,t-1}}{GVA_{t-1}}, \quad (1)$$

$GVA_{Si,t}$  the gross added value of the i-th group of economic activities at time t,

$GVA_{Si,t-1}$  the gross added value of the i-th group of economic activities at time t-1,

$GVA_{t-1}$  the total aggregate gross value added at time t -1.

The total aggregate growth rate of GVA is then equal to the sum of contributions from each group (Jilek et al., 2005). The chosen company was characterized by development of the financial indicators: return on assets - ROA (earning after taxes / assets), inventory turnover (inventory / (total outputs / 365)), creditors payment period (short-term payables / (total outputs / 365)), debt ratio (total debt / assets), labour productivity (outputs total / labour costs), the current ratio (current Assets / (current liabilities + short-term bank loans)). The data source was Eurostat (National accounts) and the business database Albertina. The observed firm data were from the 7 year period (2008-2014).

## 3 Research results

### Macroeconomics perspective

The first analysis deals with the development of performance in the industry - specifically group A2 (Industrie: Medium Low and Low Technology). The basic indicator for measuring the performance of each sector is gross value added. Table 1 illustrates the contributions of individual groups of economic activity to the change of total gross value added.

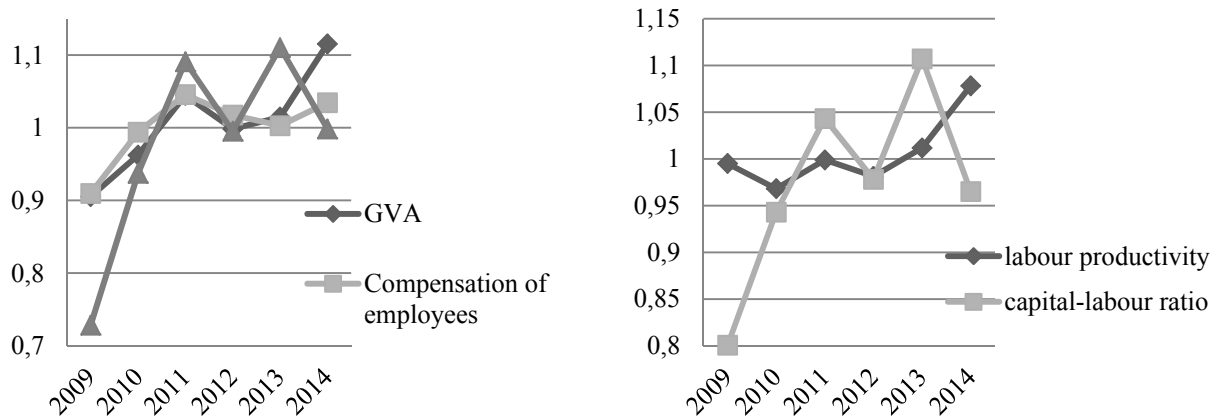
**Table 1** Contribution of individual groups of economic activity to the change in GVA (%)

Group	2009	2010	2011	2012	2013	2014
<b>Total</b>	<b>-2.576</b>	<b>0.836</b>	<b>1.501</b>	<b>0.038</b>	<b>0.486</b>	<b>5.462</b>
A1	-0.939	1,262	0,836	0.361	0.071	1.625
<b>A2</b>	<b>-1.315</b>	<b>-0.486</b>	<b>0.549</b>	<b>-0.020</b>	<b>0.185</b>	<b>1.475</b>
B1	0.895	-0.082	0.282	-0.286	0.435	0.968
B2	-1.252	0.743	-0.351	0.120	-0.132	1.223
C	0.036	-0.602	0.185	-0.137	-0.074	0.171

Source: Own processing

Year of the global crisis (2009) is characterized by a declining or even negative increase in gross value added (GVA growth rate of  $<1$ ). The group of industry (A2 - Industrie: Medium Low, Low and Technology) most contribute to the decline of GVA (2009 compared with 2008, this group contributed about 51% to the total decline in GVA). Only high knowledge intensity services B1 this year recorded a growth, while avoiding an even greater fall in GVA. Contribution groups A2 for growth GVA of whole economy begun since year 2013.

**Figure 1** The growth rate of selected indicators of economic activity for the group A2 (index)

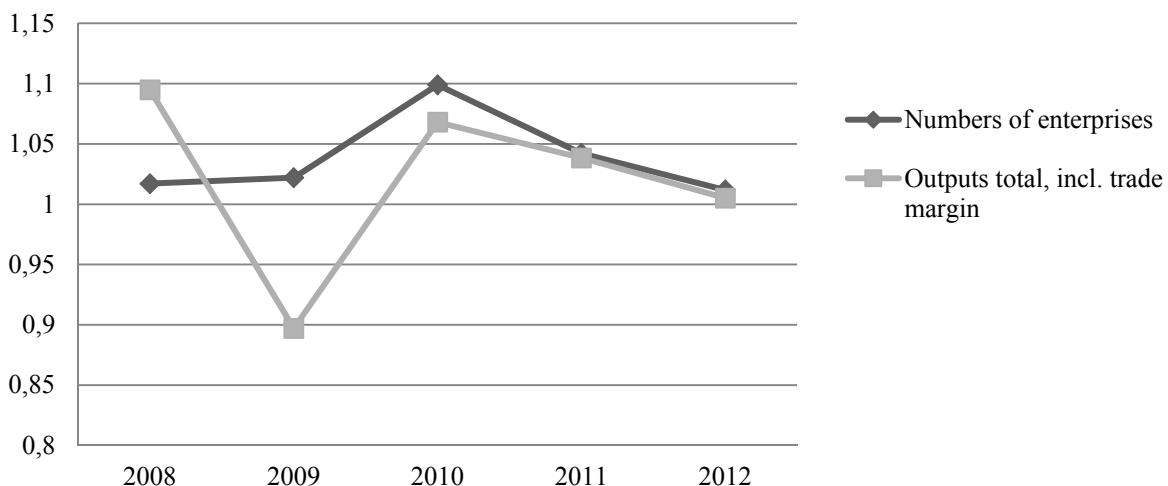


Source: Own processing

The left part of figure 1 describe growth rates of selected indicators for group A2. There is a clear decline of absolute indicators in 2009. Value of indicators in comparison with the previous year is less than 1. Gross fixed capital even declined about 27%. Since 2011 value of absolute indicators were greater than 1. Since this year, the growth rates of these indicators stable or stagnant values of indicators oscillating around 1. Until the year 2014 indicates a slight growth in gross value added and labour productivity. Labour productivity (right side of Figure 1) within the group recorded until 2012 an annual decline and the growth rate of capital-labour ratio in followed years fluctuates.

Further analysis deals with small and medium-sized industrial enterprises in particular, their number and their outcomes in the form of the growth rate of output SMEs. Significant decline was recorded mainly in the size of the output (Figure 2).

**Figure 2** The growth rate of selected indicators of small and medium industrial enterprises in the years 2007-2012 (index)



Source: Own processing

### Microeconomic perspective

The second part is based on a case study of the impact of the financial crisis in 2009 on selected economic entity. The selected firm is a representative group of economic activities A2 and a representative of small and medium industrial enterprises. It's a firm from the South Bohemian region, which has three production factories. The activities of the cooperative's metalworking and engineering, the production from the plastics, making keys, engraving works,

purchase and sale of goods locksmith, plumbing, tool manufacture and repair tools. The firm currently has a stable production program and achieve positive economic results. An enterprise expects annual growth in turnover of about 2-3%. The enterprise has a stable group of customers, exports mainly to Germany to other EU countries, as well as in Bosnia and Herzegovina. The competitive advantage of cooperatives is particularly varied field of activity and diversification manufactures the products concerned. In 2009, also in this enterprise was hit by the global crisis. This year there was a decrease in consumption of products especially German companies. Customers' payment morale has worsened. The volume of irrecoverable debts has increased significantly

**Causes:** Global crisis - an external factor, significant declines in demand for products

**Crisis management:** The firm did not react strongly to the situation. As a result of the improved economic situation in the export territories, there was a gradual recovery in production, especially for the German market.

**The impact of the crisis:** the decline in sales did not affect the existence of the company, but leads to the growth of irrecoverable debts. The positive impact of the crisis was the orientation on products with higher quality. The positive impact was also the production cooperative due to the extinction of some companies get their contracts.

Economic development of the monitored firm is further described by selected financial ratios of financial analysis (see Methods)

**Table 2** Selected financial indicators of the enterprise in the years 2008-2014

	ROA (%)	Debt Ratio (%)	Current Ratio	Labour Productivity	Creditors Payment Period	Inventory Turnover	GVA index
2008	-26.5	12.9	5.9	2.1	32.9	47.8	0.98
2009	-13.1	9.3	22.3	2.2	9.7	13.9	0.91
2010	-19.6	20.0	9.7	2.0	23.5	52.9	0.87
2011	-0.1	24.3	7.9	2.0	28.9	47.1	0.92
2012	48.6	15.8	6.7	1.2	72.5	55.9	1.1
2013	-4.2	7.3	10.8	2.3	22.4	54.2	1.07
2014	2.0	5.2	15.7	2.4	14.3	58.1	1.11

Source: Own processing

The crisis is mainly reflected growth in the GVA volume of business at the time of worsening receivables turnover and profitability. In the years following after the crisis the company returned to stable economic growth and economic results has improved.

#### 4 Conclusions

It was found the same conclusion from a macroeconomic and microeconomic point of view and that small and medium-sized industrial enterprises in the group A2 react very sensitively to the changes in real business cycle. During the financial crisis of 2009 there was a significant decrease in production (GVA). On the contrary, in the post-crisis years, there has been a higher growth performance of enterprises (GVA) than labour productivity. Performance of enterprises returned in the post-crisis period to the initial values.

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## References

- Brezinova, M., & Vrchota, J. (2015). Communication of SMEs in the region of south bohemia. *18th International Colloquium on Regional Sciences*, 136-142. doi: 10.5817/cz.muni.p210-7861-2015-17.
- Jílek, J. Fischer, J., Hindls, R., Hronová, S., Moravová, J., & Zelený, M. (2005). *Nástin sociálněhospodářské statistiky*. Prague: Oeconomica.
- Löwhagen, R. (2015). *Decision-Makers behind Effective Crisis Management: An industry comparison of a crisis prepared approach among Small and Medium-Sized Enterprises*. Internationella Handelshögskolan Högskolan i Jönköping.
- Lawless, M., O'Connell, B., & O'Toole, C. (2015). SME recovery following a financial crisis: Does debt overhang matter? *Journal of Financial Stability*, 19, 45-59. doi: 10.1016/j.jfs.2015.05.002
- Makkonen, H., Pohjola, M., Olkkonen, R., & Koponen, A. (2014). Dynamic capabilities and firm performance in a financial crisis. *Journal of Business Research*, 67(1), 2707-2719. doi: 10.1016/j.jbusres.2013.03.020
- Sirucek, P., & Pavelka, T. (2013). Youth unemployment in the Czech Republic and the impact of economic crisis. *7th International Days of Statistics and Economics*, 1278-1287.
- OECD. (2009). *The impact of the global crisis on SME and entrepreneurship financing and policy responses* (online). Organization for Economic Co-Operation and Development (OECD). Available at: <http://www.oecd.org/cfe/smes/43183090.pdf>
- Petráček, F., & Leitmanová, I. F. (2013). Economic municipal undertakings. *Aktualne Problemy Podnikovej Sfery 2013*, 440-444.
- Pantilie, C. V. (2011). Global financial crisis effects on sme development. *Quality and Innovation in Engineering and Management*, 167-169.