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Labour Productivity and Competitiveness of SMEs in Food Industry

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Abstract. Labour productivity is considered a significant factor influencing the long-term competitiveness of enterprises. The paper focuses on the link between productivity of labour and competitiveness of Czech SMEs in the food production. The research was focused on 160 Czech companies in food industry. Competitiveness is expressed through selected financial indicators (Return on assets, Return on Sales, Current Liquidity, Altman - ZETA model, model IN05). The relationship between labour productivity and selected competitiveness indicators were examined through correlation and regression analysis. It has been found that the link between labour productivity and competitiveness depends heavily on defining indicators for competitiveness. The strongest correlation was found between labour productivity and competitiveness expressed by indicator return on sales. To measure the competitiveness of SMEs indicators of profitability appear to be the most appropriate, namely the indicator of ROA and ROS. The importance of labour productivity is increasing due to high wage growth which can lead to losing competitiveness for Czech enterprises.

Keywords: Competitiveness, Labour Productivity, Food Industry.

1 Introduction

The term competitiveness has recently become a very often used term in economics and management. Competitiveness is monitored at the level of states, regions, sectors and companies. As one of the key factors influencing competitiveness is often cited labour productivity, both at the macroeconomic level and at the enterprise level. The purpose of this article is to explore the relationship between labour productivity and competitiveness of Czech SMEs in food industry.

The competitiveness of an enterprise results to a large extent from the competitive advantage that the firm has, but which is neither absolute nor permanent. Grant [6], defined a competitive advantage as the ability of a company to achieve a higher profitability than a competitor on the market.

Competitiveness can be distinguished on two levels:

- macroeconomic level (competitiveness of countries or regions)
- enterprise level (business competitiveness)

The competitiveness at the macroeconomic level OECD [14] defined such as the capability to make products which can succeed in international competition. Microeconomic competitiveness is in the centre of courtiers or regional competitiveness. Usually, it is defined as capability of company to compete successfully in a market, to grow and to be profit table in a long run. The most important definition of competitiveness is at enterprise level for the purposes of this article. The enterprise-level competitiveness is as the ability to produce and sell a particular product under the condition of maintaining profitability [8]. The product is successful if it delivers value to a customer that is determined by the manufacturer's overall profitability (efficiency) with which the product is produced. Many approaches can be used to measure a business's competitiveness. Currently, two major systems are being used to measure competitiveness: financial-based systems and systems based on the application of non-financial indicators [17]. The combination of these systems is ideal. In business practice, a large number of different financial analysis indicators or indicators are used to measure competitiveness, depicting the economic situation of the company.

Productivity we can generally defined as the ratio of output and input. We have labour productivity, capital productivity and total factor productivity. The labour productivity is linked to the production efficiency of labour and it is the typical indicator to measure single productivity of factor [13]. Labour productivity can be measured at the macro and micro level. Labour productivity we can calculate as gross domestic product per employee [2] or value added per labour cost or worked hours. Labour productivity is influence by many factors as sector [1], enterprises age, innovations [9], size of firm [3], region [4,20], country [18] business cycle [11].
It is necessary for SMEs to monitor their productivity and competitiveness. Small and medium-sized enterprises are source of economy growth, generator of development, innovation and regional growth [10]. The labour productivity of SME is influenced by many factors: human capital, management style [19] or innovations. Nowadays innovations are necessary in the labour market to increase the flexibility of employees on the labour market [15].

2 Data and Methodology

The paper deals with the link between labour productivity and competitiveness of Czech SMEs in food industry – food production. The article was focused on firms (160) categorized according to the EC (Commission Regulation no. 800/2008) as small enterprises, micro enterprises and medium enterprises. The main orientation of these companies in the food industry. The source of data for article was the firms database Albertina. Data were from the 5-year period (2012-2016).

The indicators of firms' labour efficiency and competitiveness were analysed in companies. The chosen indicator of labour efficiency (productivity) was ratio value added and labour costs. The chosen competitiveness indicators were: Return on Assets (ROA = profit before interest and taxes (Ebit) / total assets(TA) [15], Return

on Sales (ROS = net firm profit/ sales), Current Liquidity (current assets/current liabilities, model IN05, model Altman-ZETA).

Index IN05 was used in the form:

$$IN05 = 0.13x_1 + 0.04x_2 + 3.97x_3 + 0.21x_4 + 0.09x_5 \quad (1)$$

where:
x_1 – assets (TA) / debt,
x_2 - profit before interest and tax (EBIT) / interest cost
x_3 - profit before interest and tax (EBIT)/ assets total (TA)
x_4 - revenues (TR) / assets total (TA)
x_5 - current assets (CA) / short-term liabilities [7]

Altman ZETA model was used in form:

$$Z'=0.717x_1 + 0.847x_2 + 3.107x_3 + 0.420x_4 + 0.998x_5 \quad (2)$$

Where:
x_1 - working capital (WC) / total assets (TA)
x_2 - retained earnings (RE) / total assets (TA)
x_3 - EBIT (earnings before interest and taxes) / total assets (TA)
x_4 - market value of owner´s equity /book value of total liabilities,
x_5 - sales (TR) / total assets (TA) [16]

3 Results

The manufacturing is an important part of the Czech economy and at the same time a key sector for technology development, knowledge innovation and job opportunities. The share of the manufacturing industry in the creation of gross value added in 2016 reached in Czech Republic 27.1%. It is country with the second the highest portion of the manufacturing industry in gross value added within the European Union. In the Czechia, as well as in the EU, the food industry belongs to the key sectors of the processing industry. In the food industry, a large proportion of employees employ 9% of employees, but account for less than 4.5% of sales and value added. The most important group is medium-sized enterprises, which generate 45% of the volume of sales and value added within the food industry. The whole sector participated in the Czech Republic's employment by 2.56% in 2016, recording a year-on-year decline of 0.5 percentage points, yet it is a significant employer, similar to the European Union [12].

3.1 Labour Productivity

The labour productivity and average wages have been steadily rising over the period under review, as shown in Figure 1. The number of Czech food enterprises has increased, but the number of employed persons is declining. Revenues and value

added showed a staggering trend over the review period, with small changes between years. In the last two years, increase more average wages than labour productivity.

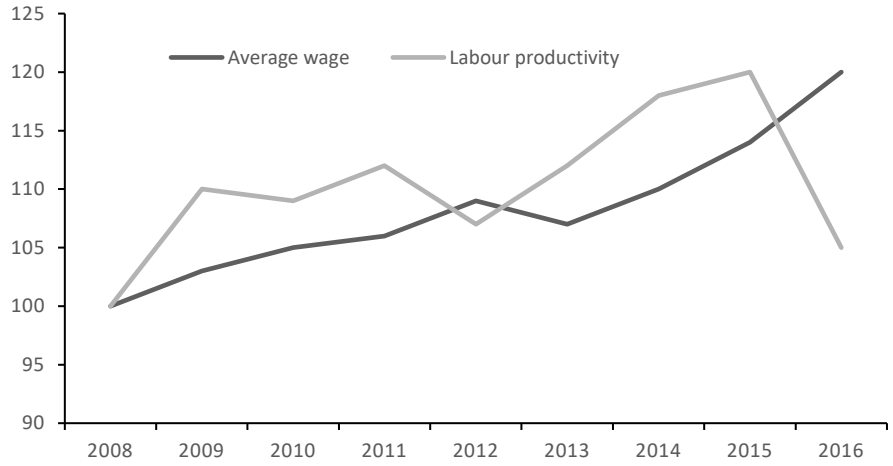

Fig. 1. Development of labour productivity and average wages in the food industry between 2008 and 2016 (2008 = 100%).

The business analysis focused on SMEs that are oriented to the food production for the period 2012-2016 (5 years). In total, there were 160 SMEs. The share of small enterprises was 55% and medium enterprises 45%. Productivity in monitored enterprises. The labour productivity computed as the share of value added and labour costs in absolute terms. Figure 2 shows an apparent initial decline in labour productivity for small businesses between 2012 and 2014, which was followed by growth up to 2016, but it should be noted that at a slower pace. The labour productivity for small businesses remained below the food industry average throughout the reporting period.

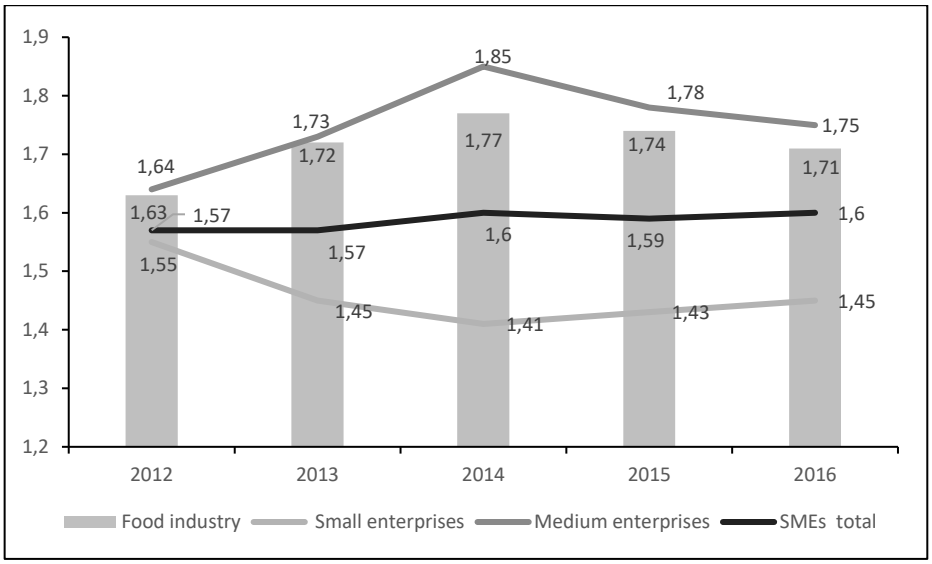

Fig. 2. Labour productivity (CZK) in the period 2012-2016.

Looking at the productivity development of small and medium-sized enterprises together, a more stagnant trend can be noticed. This suggests that the decline in labour productivity for small businesses between 2012 and 2014 was offset by the rise in labour productivity among medium-sized enterprises over the same period. A similar opposite trend can be observed between 2014 and 2016, on the contrary, the fall in labour productivity of medium-sized enterprises has been offset by labour productivity growth in small businesses. The labour productivity value of SMEs remained below the food industry average throughout the reporting period.

Table 1. Labour productivity growth rate (%) in 2012-2016.

Period	Small	Medium	SMEs total	Food industry
2012/2013	-6.66	7.56	-0.56	5.56
2013/2014	-2.19	6.78	2.3	2.47
2014/2015	1.32	-3.7	-0.72	-1.51
2015/2016	1.48	-1.73	0.48	-1.49

It is suitable to compare the labour productivity (LP) growth rates in medium-sized enterprises and the whole food industry (Table 1), where similar labour productivity developments in medium-sized enterprises operating in the food industry can be observed compared to the productivity development of the entire food industry. If the productivity of the food industry grew, the labour productivity of medium-sized

enterprises grew, as well as the decline in labour productivity across the food industry, and the productivity of work in medium-sized enterprises

3.2 Labour Productivity and Competitiveness

This part of the article analyses the relationship between firms labour productivity and competitiveness, where competitiveness is expressed through selected financial indicators (ROA, ROS, Current Liquidity, Altman - ZETA model, Czech model IN05). The link between labour productivity and selected competitiveness indicators is examined through correlation and subsequent regression analysis, both depending on the size of the enterprise and regardless of size.

Table 2. The results of correlation analysis.

	n		ROA	ROS	Liquidity	IN05	Altman ZETA
SMEs total	N=765	LP	0.37*	0.53*	0.15*	0.27*	0.22*
Small enterprises	N=426	LP	0.37*	0.51*	0.30*	0.35*	0.38*
Medium enterprises	N=337	LP	0.57*	0.55*	0.02	0.21*	0.18*

* statistical significance at the 5%

The strongest correlation was found between labour productivity and competitiveness expressed as a return on sales (Table 2). The correlation coefficient ranged from 0.51 to 0.55. If, therefore, the productivity of businesses in the food industry has increased, productivity gains have increased, and competitiveness has grown. Another significant positive correlation was found between labour productivity and competitiveness measured by the ROA. Weak weaknesses were then found between labour productivity and liquidity indicator, IN05 and Altman-ZETA. We can expect that other factors influencing the competitiveness of firms are likely to be affected here.

4 Conclusion

The paper focuses on exploration of the link between labour productivity and competitiveness of Czech SMEs in the food industry. It has been found that the link between labour productivity and competitiveness depends heavily on defining indicators for competitiveness. To measure the competitiveness of SMEs in the food industry, indicators of profitability appear to be most appropriate, namely the indicator of return on assets and return on sales. If SMEs want to increase their competitiveness and increase their performance, they can do so by increasing labour productivity. On the other hand, research of Firlej shows that it will be desirable to increase expenditures on innovations to the firm in food industry oriented on enhancement of labour productivity and product quality [5]. With this conclusion we

can agree due to high wage growth which can lead to losing competitiveness for Czech enterprises in food industry.

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