Differences in the Performance of the Dairy Industries within the Visegrad Group Countries

Ivo Zdráhal, Gabriela Chmelíková, Ivana Blažková, Věra Bečvářová

Abstract: The paper investigates the performance of firms in the dairy industry operating within the Visegrad group countries over the time period of years 2005-2014 based on the microdata obtained from the Amadeus database. Firms’ return on assets indicator (ROA) was used to evaluate the economic performance of firms in the dairy industries. On the basis of the results, it may be stated that there are similarities as well as differences in the average economic performance of dairy processing enterprises among the Czech Republic, Poland, Slovakia and Hungary. However, some of the characteristics are typical for the countries under review. The average level of economic performance of the enterprises of the dairy industry is relatively low in the Czech Republic, but its level and dynamic in the recent years are still better in comparison to the average economic performance of the enterprises of the dairy industry in Slovakia, Poland and Hungary. The dairy processing firms in Slovakia and Hungary have very similar level and dynamic of the average economic performance. There is a noticeable positive trend in the values of average economic performance in Czech Republic, Slovakia and Hungary in the second half of the observed period. In the first half of the observed period, enterprises of the dairy industry in the Poland have higher value of the average level of economic performance in comparison to those in the Czech Republic, Slovakia and Hungary, however, the average level of economic performance of enterprises in Poland is declining.

Key words: Dairy sector · Performance of firms · Visegrad group countries

JEL Classification: Q15 · Q18 · Q12

1 Introduction

The declaration of close cooperation of three Central European countries has been signed during the meeting of the president of Czechoslovakia, the Prime Minister of Hungary, and Poland's president in Visegrad in 1991. Czechoslovakia (later the Czech Republic and Slovakia), Hungary and Poland have always been a part of one civilization sharing cultural and intellectual values and common roots of religious traditions. Their integration into the European Union significantly increased their foreign political activity with the focus on promoting cooperation and stability in the wider region of Central Europe. Alongside these declared mutual understanding and cooperation among Visegrad group (V4) countries, their economies (and industries and firms) compete each other within the single market of the European Union, as well as they are facing to the competitors from other European Union countries and non-EU regions. Such patterns of competition are very similar to those in the milk sector.

Milk production, its processing and other segments of the milk value chain represent a significant and important part of the agribusiness in the European Union. Furthermore, the EU is the major player in the world dairy market and is the leading exporter of many dairy products. In 2015, the total milk production in EU28 was estimated around 159.6 million tons per year (93% is used for processing) and was produced by almost 1 million of dairy farmers. It also represents the 14% share on the value of EU agricultural output and 10% on the employment in the food industry. From the social and environmental perspective, it also contributes to the implementation of the European model of agriculture. For the same reasons, the milk industry also forms a very important part of the agricultural economy in the Visegrad group countries (European Commission, 2015a).

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Because of this importance, wide range of direct and indirect measures have been used to affect volumes, production-cost links and market prices in the milk and dairy sector. The milk and dairy sector belongs to the most regulated ones in the scheme of Common agriculture policy (Bečvářová et al., 2008). Volumes of production as well as links in the milk value chains differ significantly among the EU Member States. The largest producers of milk and milk products are Germany, France, Great Britain and Poland. Beside these major producers, some geographically small countries as Netherlands, Ireland and Denmark have also an important position in the EU milk and dairy industry.

The milk sector in the EU experienced significant economic, policy and structural changes in the last decades (Ernst & Young, 2013). The Visegrad group countries had to deal also with the specifics of transformation processes in transition economies. Currently, among the challenges of the European milk sector belong the ability to adapt on the market dynamic caused by the abolition of EU milk quotas (European Commission, 2015b) and the embargo on food imports imposed by Russia (European Commission, 2016). High performance and competitiveness of the dairy industry and ability to finalize the basic raw material into products with higher value added (and successfully face the competition within the European and global market) is an important prerequisite for keeping dimension of the milk production in the EU regions. This is valid not only for long-term development of these sectors but also in the periods of shocks and volatile markets.

The objective of the presented article is to analyse the performance of firms in the dairy industry operating within the Visegrad group countries with an emphasis on the identification of changes in levels and trends of economic performance that occurred within the period of the years 2005-2014.

2 Methods and data

The empirical analysis has been conducted using the data drawn from AMUSEUS, the trans-European database of financial information provided by Bureau van Dijk. The dataset covers the period from 2005 to 2014 and consists of enterprises active in the dairy processing industry (NACE class 150) within the Visegrad countries, i.e. the Czech Republic, the Slovak Republic, Hungary and Poland. In order to have information on total number of dairy enterprises in particular countries, we employ the data published by European Commission in the Eurostat database.

The sample of the accounting data of enterprises is made out of 3,657 observations across 10 years and 4 countries. To see the representativeness of the sample, the shares of observations by countries in the sample with those in the population are compared in Table 1.

Table 1 Shares of observations by country within the sample and in the population

<table>
<thead>
<tr>
<th>The Czech Republic</th>
<th>The Slovak Republic</th>
<th>Poland</th>
<th>Hungary</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N)</td>
<td>(N) (%)</td>
<td>(N)</td>
<td>(N) (%)</td>
</tr>
<tr>
<td>2005</td>
<td>166</td>
<td>46</td>
<td>27.7</td>
</tr>
<tr>
<td>2006</td>
<td>146</td>
<td>47</td>
<td>32.2</td>
</tr>
<tr>
<td>2007</td>
<td>146</td>
<td>52</td>
<td>35.6</td>
</tr>
<tr>
<td>2008</td>
<td>178</td>
<td>52</td>
<td>29.2</td>
</tr>
<tr>
<td>2009</td>
<td>186</td>
<td>52</td>
<td>28.0</td>
</tr>
<tr>
<td>2010</td>
<td>207</td>
<td>51</td>
<td>24.6</td>
</tr>
<tr>
<td>2011</td>
<td>199</td>
<td>50</td>
<td>25.1</td>
</tr>
<tr>
<td>2012</td>
<td>188</td>
<td>52</td>
<td>27.7</td>
</tr>
<tr>
<td>2013</td>
<td>178</td>
<td>46</td>
<td>25.8</td>
</tr>
<tr>
<td>2014</td>
<td>181</td>
<td>36</td>
<td>19.9</td>
</tr>
</tbody>
</table>

Note: Population refers to all firms active in the dairy processing industries within the particular analysed countries.
Source: Eurostat, AMADEUS; authors elaboration

Firm performance is measured as the firms’ return on assets indicator (ROA) that reflects the ability of a firm’s management to generate profits from the firm’s assets. ROA is calculated as a firm’s profit/loss before taxation and interest (EBIT) divided by total assets. To assure that ROA is independent of the financial means used to create total assets, interest are added to the numerator. The formula is as follows:

\[ \text{ROA} = \frac{\text{EBIT} + \text{Interest}}{\text{Total Assets}} \]
Where $ROA_i$ stands for return on assets of a firm $i$, $EBIT_i$ stands for earnings before interest and tax of a firm $i$ and $Total\ Assets_i$ represent sum of total invested capital.

Although ROA belongs to the profit measures most used in previous studies, it should be mentioned that accounting data might be biased due to profit smoothing or cross subsidization of subsidiaries, as stated by Hirsch and Hartmann (2014). Many authors have discussed the appropriateness of this indicator with the result that accounting profits are suitable to reflect real economic profits (e.g. Fisher and McGowan, 1983; Long and Ravenscraft, 1984). Because of the mutual comparability of the observed companies and the ability to characterize the average performance of a whole industry, for every company the return on assets has been relativised by conversion to a weighted return on assets in accordance to the following equation:

$$ROA_{\text{we}} = \frac{EBIT_i}{Total\ Assets_i} \times \frac{Total\ Assets_i}{Total\ Assets_s}$$

Where $ROA_{\text{we}}$ stands for the weighted return on assets of a firm $i$, $EBIT_i$ stands for earnings before interest and tax of a firm $i$, $Total\ Assets_i$ represents sum of total invested capital in the firm $i$ and $Total\ Assets_s$ stands for the total capital invested into all firms in the sector, that have been included into the research sample.

Table 1 reports the descriptive statistics of ROA indicators for all firms involved in the analysis. The profitability indicator ROA of dairy processing firms varied considerably across the Visegrad group countries and over the study period. The average values of ROA indicate positive profitability in the Czech Republic and Poland, nonetheless, there are substantial differences among particular firms as seen in Table 1 – e.g. ROA in the Czech Republic with a mean of 4.31% reaches values from -112.32% to 107.51%, which follows from the use of microdata instead of sectors’ averages. The high heterogeneity of microdata is confirmed also by descriptive statistics of ROA in other countries. In the Slovak Republic and Hungary there were observed negative average values of ROA, however the median is positive, which indicates that more than a half of firms reached positive profitability. The highest statistical dispersion of ROA was observed in the case of enterprises in The Slovak Republic and Hungary, in contrast to the Czech Republic, where the standard deviation is relatively low, which indicates the similar level of firm profitability among Czech dairy processing firms.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev.</th>
<th>Obs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA – The Czech Republic</td>
<td>0.0431</td>
<td>0.0390</td>
<td>1.0751</td>
<td>-1.1232</td>
<td>0.1599</td>
<td>484</td>
</tr>
<tr>
<td>ROA – The Slovak Republic</td>
<td>-0.0762</td>
<td>0.0101</td>
<td>5.8710</td>
<td>-9.5834</td>
<td>0.7233</td>
<td>344</td>
</tr>
<tr>
<td>ROA – Poland</td>
<td>0.0312</td>
<td>0.0283</td>
<td>5.4335</td>
<td>-9.4800</td>
<td>0.3722</td>
<td>2048</td>
</tr>
<tr>
<td>ROA - Hungary</td>
<td>-0.1692</td>
<td>0.0099</td>
<td>1.9717</td>
<td>-10.2199</td>
<td>0.8363</td>
<td>781</td>
</tr>
</tbody>
</table>

Source: authors elaboration

3 Research results

On the basis of the results of the conducted analyses, it may be stated that there are similarities as well as differences in the average economic performance of dairy processing enterprises among the Czech Republic, Poland, Slovakia and Hungary, as it can be seen from the figure 1.

The dairy processing enterprises in the Czech Republic reached an average ROA of 4% between 2005 and 2010. There can be seen the deviation in results of ROA in 2008, namely the decrease in the value to the level of 0%, which was the consequence of the crisis in the milk sector due to the global economic crisis and downturn in the price of processors in the fourth quarter of 2008 and in 2009. The increase in ROA back to a level of around 6% in 2009 was caused by the low producer prices of milk, which partly compensated the low prices of processors. Since 2010, it has been observed increasing values of ROA to the level of between 8% and 10% at the end of the reporting period.
Enterprises in the dairy industry in the Slovak Republic reached throughout the reporting period in average lower values of ROA compared to the enterprises in the Czech dairy processing industry with the exception of 2008, as mentioned above. Smutka and Malá (2014) investigated technology and efficiency differences between processing companies in the Czech and Slovak republic. They concluded significant differences in the technology between the Czech and Slovak dairy industry. These differences cause negative effects for Slovak dairy companies (productivity parameters, technological change). Also, technical efficiency is higher in the Czech dairy companies in comparison to the Slovak ones. Generally, the Slovak dairies achieved very low levels of profitability, ROA fluctuated mostly between plus 2% and minus 2%. It took longer time the dairy processing industry of the Slovak Republic to overcome the effects of the crisis in 2008 in terms of profitability, and only since 2011, the improvement in ROA can be identified.

If we use the mutual balance of foreign trade between the Czech Republic, the Slovak Republic and Poland as a measure of competitiveness of dairy food industries in these countries, The Poland's dairy processing industry can be seen as more successful in comparison with the dairy industry of the Czech and the Slovak Republic. This is in line with the research results published by Špička (2015), who found out the lower rate of technological progress in the Czech and Slovak dairy food industries in comparison with Poland in the period of years 2008-2013. This concept of competitiveness corresponds also with the average level of ROA of the dairy processing industry in Poland. In the years 2005-2010 the dairies in Poland reached higher values of ROA in comparison with the Czech Republic. It is worth mentioning the declining tendency of the average ROA in Poland, and the question arises, what are the causes of this development. This decline also caused higher reported ROA values in the Czech Republic compared to Poland.

In the period of 2005-2010 the dairy processing enterprises in Hungary reported the lowest values of ROA compared to other countries of the Visegrad group. From the viewpoint of the level and development of the average ROA values, Hungary is close to the Slovak Republic. Similarly to the Czech and Slovak Republic, there can be observed an increasing trend of ROA values in Hungary during the second part of the observed period.

4 Conclusions

The objective of the presented article was to analyse differences in the performance of the dairy industries within the Visegrad Group countries with the emphasis on the identification of changes in its levels and trends that occurred within the period of the years 2005-2014. Firms’ return on assets indicator (ROA) was used to evaluate the economic performance of firms in the dairy industries. On the basis of the results of the conducted analyses, it may be stated that there are similarities as well as differences in the average economic performance of dairy processing enterprises among the Czech Republic, Poland, Slovakia and Hungary. However, some of the characteristics are typical for the countries under review. The average level of economic performance of the enterprises of the dairy industry is relatively low in the
Czech Republic, but its level and dynamic in the recent years are still better in comparison to the average economic performance of the enterprises of the dairy industry in the Slovakia, Poland and Hungary. Enterprises of the dairy industry in the Czech Republic have significantly higher average economic performance in comparison to the average economic performance of the dairy processing firms in the Slovakia and Hungary. The dairy processing firms in the Slovakia and Hungary have very similar level and dynamic of the average economic performance. There is noticeable positive trend in the values of average economic performance in Czech Republic, Slovakia and Hungary in the second half of the observed period. In the first half of the observed period, enterprises of the dairy industry in the Poland have higher value of the average level of economic performance in comparison to those in the Czech Republic, Slovakia and Hungary, however, the average level of economic performance of enterprises in Poland is declining. Certain limitation of this analysis is the interpretation of results, because the interpretation of results is based only on an average economic performance of the enterprises of the dairy industry in the investigated group of companies. In the further research, the authors will therefore focus on analysis, identification and interpretation of changes in the level of economic performance as well as causalities determining this economic performance in the total population of enterprises on the one hand, and in the specific segments of these enterprises on the other hand.

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