ECONOMIC EFFECT OF DAIRY PROCESSING INTEGRATION IN THE BALTIC STATES

Janis Ozolins

Latvia University of Agriculture, Latvia

Dairy sector is an important part of the Baltic States’ agriculture. Dairy sector’s structural aspects are crucial for its sustainable development as fragmentation is characteristic for dairy farming in Latvia and Lithuania, and dairy processing in Latvia and Estonia. Integration may help decrease the sector’s fragmentation. The author analyses economic effect along the main integration dimensions in the Baltic States’ dairy processing over the period of 1996-2009. In contrast to the previous research, the author uses with minor exclusions a comprehensive data set of all dairy processing companies operating in the Baltic States as of October 1, 2010. Gross value added at factor cost is used as a key indicator of the economic effect. Other financial analysis indicators, inter alia, structure of capital, liquidity, profitability, and debt management indicators are used to evaluate economic effect and performance of dairy processing companies with specific integration characteristics.

Key words: integration, dairy processing, economic effect.

JEL classification: L11, L22, N54, Q13

Integration of dairy processing companies may be promoted by state intervention, thus possibly increasing their economic effect. However, there is not enough research evidence to support or oppose various forms of integration with respect to associated benefit to the economy and the companies’ financial standing. In void of research evidence, structural policy decisions are taken on basis of political process. Previous research by other authors is based on sector-level statistics (Jansik, 2009, p. 8) or sector statistics and data from a few largest companies (Girgzdiene et al, 1999, p. 10; Hartmann and Wandel, 1999 p. 244; Kedaitiene and Hockmann, 2002, p. 17; Jasjko et al, 2007, p. 56).

In view of the possible importance of dairy processing sector structure for the development of the Baltic States’ dairy sectors, it is useful to research economic effect of integration.

The aim of this paper is to evaluate economic effect aspects of integration in the Baltic States’ dairy sector secondary level. The following tasks had been set to reach the aim:
– analysis and evaluation of the Baltic States’ dairy processing company integration patterns;
– analysis of economic effect associated with various dimensions of integration.

Hypothesis of the paper is - integrated dairy processing companies produce higher economic effect than non-integrated companies do.

Introduction

Appropriate natural resources, availability of existing infrastructure, and long-term forecasts for world food market determine the rationale for retention and development of dairy sector in the Baltic States (Ozolins, 2009, p. 245). Revealed comparative advantage analysis shows that Latvian indicators in the group of dairy and dairy products have become positive since 2004 and are growing rapidly (Saboniene, 2009, p. 53). The sector in Latvia faces significant economic problems, which affect its competitiveness, inter alia, fragmented milk production and processing (Leimane et al, 2006, p. 34). Research carried out in other EU countries provides evidence that larger processing units are needed to shift the emphasis onto more value added products, e.g. in Ireland (Briscoe and Ward, 2006, p. 119).

The Baltic States’ (Latvia, Lithuania, and Estonia) dairy sectors are connected via market for crude milk and processed milk products. Improved dairy processing industry structure may facilitate dairy sector development. Most changes take form of either integration arrangements involving rights of ownership or bankruptcy of companies. Dairy processing has not been attractive for setting up entire large production plants due to low return on equity and profitability statistics. Takeovers and mergers of the existing processing companies have been resulted in creation of major market participants.
Materials and methods

In contrast to other research, the author has used data of all dairy processing companies approved by the authorities of the Baltic States as of October 1, 2010 (Svaigpiens un piena produkti..., 2010; Veterinarini patvirtinima..., 2010; Ettevotete loetelud..., 2010). The database included 725 annual reports’ data of totally 71 Latvian, Lithuanian, and Estonian dairy processing companies for the period of 1996-2009 in Latvia and Estonia, and 2003-2009 in Lithuania (Table 1). Earlier Lithuanian data were unavailable. In correlation, ANOVA and regression analyses, the author presents results that are significant at least on the 0.05 level. All referred correlation coefficients are Spearman’s rho, since the analysis involved integration status dummy variables.

Evaluation of results

Integration of dairy processing companies in the Baltic States

Integration direction dimension. In 1996, in Latvia and Estonia approximately one-fifth (17%) of dairy processing companies owned or were owned by other dairy processing companies (horizontally integrated) and 14% of companies were vertically integrated (owned by dairy farmers or their organisations). In 2004, the proportion of horizontally integrated companies had increased to 27% and remained approximately at the same level until 2009. Structures in Latvia and Estonia were similar. Higher level of horizontal integration was characteristic to Lithuanian dairy processing sector. Approximately 50% of Lithuanian dairy processing companies were horizontally integrated in 2004 and by 2009; the level had increased to 78%. None of Lithuanian dairy processing companies were vertically integrated (Figure 1).

In 2004, horizontally integrated Baltic Sates’ dairy processing companies generated 74% of the net turnover while only 8% was generated in vertically integrated companies. Along integration direction dimension, Lithuanian dairy sector shows evidence of increasingly higher integration level, while in the other States integration processes have slowed down after 2002. Latvian integration processes had slowed down not only in terms of number of integrated companies but also in terms of net turnover in the period after 2005.

Integration level dimension. Rights of company owners as specified in legal enactments may mainly differ by three levels: share ownership in excess of 50% (high level), ownership of...
20-50% of company shares (medium level) and that of below 20% (low level). The author has analysed integration patterns by ownership share. A conclusion was drawn that medium level of integration was not characteristic; in cases when medium level of integration was observed it had not existed longer than for 4 years. Ownership of less than 20% was observed in an insignificant number of cases. Integration via ownership is used to control other companies rather than to collaborate.

Integration temporal dimension. The author analysed the proportion of cases in which integration arrangements existed for up to 3 years (short period), from 3 to 6 years (medium period) and over 6 years (long period). In the period of 1996-2003 integration period was short and medium both in 10% of cases and long in 12% of the examined cases in Latvia and Estonia. In period of 2004-2009, in Latvia and Estonia only in 3% of cases integration period was short, medium in 6% of cases, and long in 27% of cases. No previously non-integrated companies had joined integration arrangements in Latvia from 2004 to 2009. In the period from 2004 to 2009, in 47% of cases integration period of companies was long, in 7% of cases medium, and in 12% of cases - short.

Integration territorial dimension. Integration ties of the Baltic States’ dairy processing companies have been mostly observed among ones legally registered in the same country. In Lithuania, there was only one case of transnational integration – a subsidiary plant of a Finnish ice cream company. All other companies in Lithuania were locally integrated. In Latvia, there was one case of transnational integration when a large dairy company owned a small Russian dairy processing plant for a 4-year period and no cases of regional integration in the sample group. One-quarter to one-third of integrated Estonian companies were owned by dairy processing companies outside the Baltic States: the largest Finnish company Valio owned 2 companies and a large Austrian company Berglandmilch owned one company.

Several Baltic dairy companies had expressed interest in expanding their production to other Baltic States; however, this had not implemented to a notable extent by the end of 2009. It should be noted that a number of the dairy processing companies are owned by foreign financial investors which provide international management know-how but are not specialised in dairy business or marketing.

Integration effect on gross value added and number of employees

Gross value added is one of the main measures that can be used to estimate economic effect of dairy processing company activity. In 62% of cases, dairy processing companies’ annual reports contained sufficient data to calculate gross value added at factor cost (GVA). Main components determining gross value added at factor cost included personnel expenditures and related taxes, depreciation and created surplus value before adjustments for extraordinary income or loss, financial activity, and income tax. GVA generated by a company indicates how much the company contributes to the official economy. Personnel costs together with related taxes and profit together with related
corporate income tax are of particular interest to financial managers of dairy processing companies. This results in activities ranging from legal tax avoidance to tax evasion in case of which real company economic effect is to a certain extent obscured in annual reports. It is of public interest that companies generate higher gross value added, since it means a higher amount in employee income, more employment-related taxes paid, and more corporate income tax revenue for the state.

Being dominating entity (status of major owner in other dairy companies) in a horizontal integration arrangement is closely positively correlated (0.62) with log-transformed GVA, while company non-integration status is closely negatively correlated with log-transformed GVA (-0.51). Non-integrated company status in the two largest quartiles by net turnover is, however, moderately positively correlated (0.23) with log-transformed GVA. There was a very weak correlation in this respect for dependent (owned by other dairy processing companies) integrated companies. Transnational integration status was weakly positively correlated (0.13), while local integration status was moderately correlated (0.44) with log-transformed GVA. The analysis of variance allowed inferring that there were statistically significant differences between mean log-transformed GVA values for non-integrated, dominating horizontally integrated and dependent horizontally integrated companies. Graphic analysis indicated a close linear relationship between log-transformed net turnover and log-transformed GVA. Obtained linear regression equation direction coefficient values at model R square values above 0.84, however, were lower for non-integrated companies (0.95) while the coefficient’s value was 1.10 for dominating horizontally integrated companies.

A derived variable GVA coefficient (computed as gross value added over the sum of net turnover and other operation income) was used to explore possible differences in GVA generation efficiency by companies with diverse integration characteristics. The author did not find any statistically significant association between integration characteristics of companies and their GVA coefficient values. The highest GVA coefficient values were for four companies, which both produce and process milk, since they had higher ratios of personnel expenses, positive profit ratios, and above-average depreciation. This group was followed by 2 large dairy processing companies with high personnel expenses and above-average profit ratios. The rest of companies in Top 10 were commercially unprofitable with relatively high personnel costs and depreciation.

In 77% of cases, dairy company annual reports contained data that made it possible to calculate log-transformed net turnover per employee. The indicator value was moderately correlated with status of dominating company in horizontal integration arrangement (0.29), weakly correlated for dependent horizontally integrated companies, and moderately negatively correlated with non-integrated company status (-0.31). Non-integrated company status in the two largest quartiles by net turnover was moderately positively correlated with the analysed indicator (0.21). Association of status of transnational integration with log-transformed net turnover per employee was higher (0.24) than of locally integrated companies. Positive correlation strength tends to increase with the length of integration relationship period.

### Integration impact on financial indicators

Integrated company status was weakly negatively correlated with a company’s quick ratio value (-0.1). Status of being non-integrated was weakly positively correlated with the quick ratio. Time series analysis of mean quick ratio values over the period of 1996-2009 revealed that in almost all years dominating horizontally integrated companies’ coefficient values were the lowest ones. This can be attributed to growing current liabilities while cash and cash equivalents, and short-term investments remained relatively stable. Mean quick ratios of vertically integrated companies were superior to the ratios

<table>
<thead>
<tr>
<th>Company category</th>
<th>Liquidity (quick ratio)</th>
<th>Capital structure (debt to common equity ratio)</th>
<th>Profitability (profit ratio)</th>
<th>Profitability (return on equity)</th>
<th>Debt management (days sales outstanding)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominating horizontally integrated</td>
<td>▼</td>
<td>▲</td>
<td>■</td>
<td>▼</td>
<td>▼</td>
</tr>
<tr>
<td>Dependent horizontally integrated</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
</tr>
<tr>
<td>Vertically integrated</td>
<td>▲</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
</tr>
<tr>
<td>Non-integrated</td>
<td>■</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
</tr>
<tr>
<td>Produce and process milk</td>
<td>▲</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
</tr>
</tbody>
</table>

Legend: ▼ - inferior; ■ – average; ▲ – superior

Source: author’s evaluation
of dependent integrated companies. Vertically integrated companies’ most liquid assets values stayed balanced with slowly growing current liabilities, whereas, in case of dependent integrated companies, the situation was similar to that of dominating integrated companies. Non-integrated companies’ quick ratios were above average until 2004 (Table 2). Quick ratio analysis illustrates that horizontally integrated companies were more tended to invest, thus subjecting themselves to financial risks due to lower liquidity.

Debt to common equity ratio was lowest during almost all years for companies that both produce and process milk. Debt to common equity ratio of dominating integrated dairy processing companies was also rather stable, varying between 1.24 and 2 times. Mean debt to common equity ratio of non-integrated, vertically integrated, and dependent integrated companies has exceeded 2 times since 2004. In contrast to the flat nature of dominating companies, timelines of dependent integrated, vertically integrated, and non-integrated companies shared joint fluctuation behaviour. It can be inferred that only the relatively small farming and processing companies and dominating integrated companies have managed to shield their financial position as debt to common equity ratio is one of the essential determinants of ability to obtain loans.

Profit ratio was negatively correlated (-0.1-0.15) with the following types of integration status: dominating horizontally integrated, locally integrated, transnationally integrated, and dependent horizontally integrated. Positive weak correlation was established for non-integrated companies and moderate positive correlation level was found for companies that both produce and process milk.

Dominating horizontally integrated companies’ mean profit ratios were varying around the industry average ratio, while those of large horizontally integrated dominating companies with the turnover of over EUR 50 million were mostly above the average (Table 1).

Mean return on equity (ROE) of vertically integrated companies was fluctuating significantly around the mean industry value of 18%. ROE of companies that both produce and process milk has been below the industry average most of the years. Mean ROE values of dominating horizontally integrated companies has been between 10% and 20% most of the years, while those of dependent horizontally integrated companies in most cases were below 10%. No significant difference between ROE of large and small dominating horizontally integrated companies was observed. An increasing trend for ROE of non-integrated companies was observed until the 2008 financial crisis.

Days sales outstanding (DSO) ratio was weakly positively correlated with the status of horizontal integration (0.2) and weakly negatively correlated with the status of vertical integration. Mean DSO value during the period of 1996-2009 was 34 days; while an increasing trend was observed after 2004. Vertically integrated companies have shown the lowest ratio values in almost all analysed years. Dependent horizontally integrated companies’ DSO values have almost always been higher than for integrated companies. Dominating horizontally integrated companies showed the longest DSO period, especially a sub-group with the net turnover in excess of EUR 50 million. DSO periods for non-integrated and dependent horizontally integrated companies did not differ significantly over the analysed period. Larger horizontally integrated dominating companies are more engaged in production for exports markets, which influences the period of customer debt turnover.

**Conclusions**

Extensive potential exists for further integration of the Baltic States’ dairy processing companies, especially in Latvia and Estonia. Integration via ownership ties is mostly used to exercise control over other companies rather than to collaborate, which reflects the general competitive climate. Integration processes have decelerated in Latvia after 2004, while further integration is observed in the other Baltic States. Integration potential is yet expecting to be exploited, especially in view of no substantial presence of large multi-national companies in the dairy processing sector.

GVA is one of the main indicators to estimate the economic effect of a company. The author found no evidence that dairy processing companies with certain integration characteristics generate more GVA in relation to their turnover. Nevertheless, integrated companies generate more GVA when they become larger in terms of net turnover than non-integrated companies do. Integrated dairy processing companies are more effective in using labour.

Companies that both produce and process milk have the best financial standing as they receive public support for farming and all value-added, often down to own retailing, is generated within one organisation. These are small market participants able to supply local market with quality products. The Baltic States have been heavily impacted by the 2008 economic crisis and purchasing power for premium dairy products is low. Vertically integrated, dairy cooperative-owned companies produce mostly satisfactory financial results, especially those of liquidity and ROE. Non-integrated companies’ financial results are on the average mediocre. Although they are often profitable, capital structure may prevent further borrowing and debt management is less efficient. Dependent horizontally integrated companies’ financial “health” falls behind the other company categories, since their financial standing may not be of paramount interest to their owners. Dominating horizontally integrated companies have mostly good capital structure ratios, which allow them to attract further funds.

Although integrated dairy processing companies produce higher economic effect than non-integrated ones in terms of GVA and employees, financial standing analysis does not allow concluding that they are in a strong, sustainable financial position. This may indicate that the structure of dairy sector secondary level is not yet optimum and further integration...
is necessary to utilise the Baltic milk resources by achieving economies of scale, scope, and higher presence in the export markets.

**Bibliography**