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Profitability and business excellence analysis of dairy industry in Serbia

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Summary

In this paper, sixteen Serbian dairy companies representing the Serbian dairy industry were analysed using the BEX model in period 2007-2009. The results were compared to selected companies which represent the Serbian market through BELEX15 and BELEXline indices, indices of the Belgrade Stock Exchange. Research shows that the dairy industry is more profitable than the market average represented by the indices of Belgrade Stock Exchange. The profitability of dairies was analyzed from the sales structure and distribution channels point of view. This paper shows that, according to selected Business Excellence Model, dairy industry in Serbia was, and still is, in better shape than Serbian market in general, which makes it interesting not only for domestic, but also for foreign investors. Despite the crisis and lack of organisation in raw milk buyout, improvements in core-business have been made.

Key words: dairy industry, business excellence, BEX index, profitability analysis

Introduction

Dairy companies are getting larger. The resulting gains in economies of scale have increased their profit margins. Between 2000 and 2003, the average size of large businesses dropped, but subsequently the trend has reversed. In the period 2004-2009, large EU dairy companies have grown year by year driven by merger and acquisition activity (Tacken et al., 2009). Mergers and acquisitions are also characteristic for the dairy industry in Serbia. Consequently, profitability is at a high level. Foreign investors, as well as domestic ones, recognized the dairy industry potential. Not only the market leaders, but also other dairy companies have been taken over by the foreign companies.

The EU dairy industry is yearly processing 135 billion litres of raw milk into a broad range of products, both for consumption and application in the production of many food, feed and pharmaceutical products. The various dairy products produced by the European dairy industry, such as liquid milk, cheese, fresh dairy products and butter, are an essential and functional contribution to the diet of all consumers in Europe. According to the European Dairy Association (EDA), the dairy industry is one of the industry sectors of main importance for a healthy development of Europe. Average milk production in Serbia in the ten year period (1998-2007) was 1,641 million litres. Contrary to world growth trends, in Serbia a 2 % decline is expected according to the Serbian Chamber of Economy.

According to Serbian Chamber of Economy survey (ICP, 2010) milk consumption in Serbia is 180 litres per person, compared to 900 in Denmark,

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400 in Sweden, more than 300 in Finland, Ireland and Holland. In the consumption structure, milk dominates with more than 50 %. Consumption of products such as butter, cheese and yoghurt in the developed countries is up to 80 %.

In Serbia, there are more than 200 dairies, but their average capacity usage is up to 60 %. Big dairies own 90 % of total capacity; medium sized 6 %; and the small dairy companies only 4 % of total capacity. (Vlada Republike Srbije, 2010). From more than registered 200 dairies, only 123 are active. That most probably means that all the others operate in grey - nonregistered analytical zone. From processed raw milk in dairy plants 17 % is turned in pasteurized milk, 35 % in fermented liquid milk products and 31 % in cheese and other non-liquid dairy products. Empirical results of price transmission suggest that there is over-shifted elasticity. Price asymmetry in dairy commodity chain in Serbia is also confirmed (Popović and Radovanov, 2010).

From annual milk production in the EU, 93 % is bought by the dairy industry. In Serbia, this figure reaches 60 % (825 tones). Big dairies in Serbia buy out cca 1.3 million litres daily, or 61 % from total buy out (Vlada Republike Srbije, 2010).

Yield per dairy cow in Serbia is 18 % lower than the world average and 50 % lower than the European average. In Serbia, there are in average 0.34 head of cattle per hectare of arable land, compared to the 2.2 cows per hectare of arable land in the EU. In the creation of Serbian GDP agriculture accounts livestock is 30.5 %, while in developed countries this percentage reaches 60 %. Number of dairy cows fell from 938,000 in the year 1989 to 468,000 in 2010.

Market leader is the one having a dominant position. Furthermore, the owner of the market leader, Danube Foods Group, is also owner of Novosadska Mlekara (which was incorporated into Imlek) and Mlekara Subotica. Danube Foods Group is not only the biggest company but also the only one which buys out milk on the whole Serbian territory. Research made in 2008 (Petković, 2008) proved that Serbian market is a highly concentrated one, with Herfindahl-Hirshman`s index value more than 2,200. In January 2011, the Serbian Commission for Protection of Competition charged a 306 million RSD fine to Danube Foods Group (Imlek and Mlekara Subotica) for abusing the dominant market position. Other dairy companies are active mainly on local markets.

The importance of the dairy industry for the global economy is limited by the fact that the most dairy products are consumed in the region where they are produced. The Opinion of the European Economic and Social Committee (2010), shows that around 8 % of global dairy production is traded on the world market. Small change in global production can therefore have a significant influence on the world market (A 2 % gap between global production and global consumption is the equivalent of about 25 % of the world dairy market trade). Also, Kandžija and Donadić (2009) have proved that international agricultural trade is not a relevant factor of the global economic growth, but does to some extent, however, exert its impact.

Materials and methods

In this paper profitability and financial position of Serbian dairy industry have been analysed in period 2007-2009. Profitability of dairies was analyzed from share of major product groups in sales and share of sales through large retail channels point of view.

This research was based on financial statements published on Belgrade Stock Exchange web page, Serbian Business Registers Agency (SBRA), and on data collected from observed dairies.

There are more than 200 dairy companies in Serbia. Five of them are classified as big and 16 as medium sized companies in 2010. The mentioned 16companies represent more than 80 % of the market. Analysed companies are: Imlek, Mlekara Šabac, Somboled, Mlekara Subotica, Mlekoprodukt Zrenjanin, (as the big 5), followed by Niška mlekara, Mlekara Plana, Mlekara Loznica, Mlekara Mladost Kragujevac, Mlekara Leskovac, Mlekara Lazar Blace, Valletta d.o.o. Kotraža, Milkop d.o.o. Raška, Kuč-Company d.o.o. Kragujevac, Mlekara Granice Mladenovac and Kikindska industrija mleka, as medium-sized dairy companies. Those are the biggest sixteen companies, with around 3,900 employees in total. Three dairies were excluded from the analysis of major product groups share in sales and share of sales through large retail channels: Valletta, ltd (the production was stopped in 2011), as well as one big and one medium-size dairy due to the lack of data.

Table 1. Serbian dairy industry summary

	Total debt / Capital			ROE			ROA			BEX index		
	2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
Dairy Industry												
Market leader - consolidated data		0.80	0.82		3.37 %	7.68 %		4.90 %	9.99 %		0.82	1.43
Market leader	0.54	0.70	0.75	4.1 %	9.99%	9.29 %	4.1%	8.67 %	11.19 %	0.65	1.33	1.55
Industry	0.53	0.89	0.81	6.7 %	12.3 %	10.39%	5.4 %	9.45 %	11.21 %	0.85	1.46	1.57
Standard deviation	1.77	2.36	1.48	0.35	0.18	0.15	0.06	0.08	0.09	1.77	1.19	1.79
Average	1.70	2.28	1.45	-4.2 %	12.2 %	15.9 %	5.2 %	9.4 %	12.1 %	0.60	1.67	2.04
Sample	6	16	16	6	16	16	6	16	16	6	16	16
Maximum	5.32	6.90	5.34	0.34	0.62	0.55	0.13	0.27	0.23	1.99	3.81	5.28
Minimum	0.16	0.16	0.13	-0.79	-0.12	0.00	-0.07	-0.01	-0.14	-3.19	-0.58	-3.23
Median	0.54	0.92	0.76	0.04	0.04	0.13	0.08	0.09	0.13	1.55	1.57	2.21
Belex15												
Industry	0.44	0.69	0.66	8.2 %	8.19 %	7.70 %	5.1 %	6.66 %	6.59 %	0.92	1.02	0.98
Standard deviation	0.31	0.52	0.42	0.05	0.03	0.03	0.04	0.05	0.05	1.16	1.51	0.97
Average	0.45	0.66	0.65	7.5 %	7.5 %	7.2 %	4.2 %	5.0 %	4.9 %	1.19	1.48	1.19
Sample	9	9	9	9	9	9	9	9	9	9	9	9
Maximum	1.07	1.84	1.39	0.19	0.11	0.11	0.10	0.10	0.11	3.96	5.24	3.22
Minimum	0.07	0.05	0.09	0.02	0.02	0.01	-0.05	-0.06	-0.07	-0.25	-0.35	-0.38
Median	0.35	0.49	0.48	0.05	0.07	0.08	0.04	0.08	0.07	0.65	1.18	1.04
Belexline												
Industry	0.89	1.13	1.38	5.8 %	2.48 %	-15.3 %	3.1 %	4.52 %	3.33 %	0.60	0.72	0.41
Standard deviation	1.12	1.23	3.24	0.15	0.31	1.39	0.07	0.07	0.09	1.43	1.49	4.92
Average	1.03	1.19	1.58	6.6 %	10.9 %	-16.7 %	3.7 %	4.7 %	4.0 %	0.95	1.14	0.59
Sample	75	75	75	75	75	75	75	75	75	75	75	75
Maximum	5.15	4.77	26.8	0.56	2.62	0.68	0.21	0.27	0.26	5.07	5.24	12.3
Minimum	0.03	0.05	0.04	-0.65	-0.20	-11.40	-0.20	-0.13	-0.20	-4.77	-4.51	-35.1
Median	0.56	0.71	0.60	0.05	0.05	0.04	0.03	0.04	0.03	0.65	0.84	0.75
Belexline witout NIIS												
Industry	0.83	1.06	0.97	7.0 %	8.81 %	5.08 %	3.7 %	5.23 %	5.51 %	0.67	0.89	0.84
Standard deviation	1.13	1.24	3.26	0.15	0.31	1.39	0.07	0.07	0.09	1.44	1.50	4.95
Average	1.03	1.19	1.55	6.7 %	11.2 %	-15.3 %	3.8 %	4.7 %	4.0 %	0.95	1.15	0.60
Sample	74	74	74	74	74	74	74	74	74	74	74	74
Maximum	5.15	4.77	26.8	0.56	2.62	0.68	0.21	0.27	0.26	5.07	5.24	12.3
Minimum	0.03	0.05	0.04	-0.65	-0.20	-11.40	-0.20	-0.13	-0.20	-4.77	-4.51	-35.1
Median	0.55	0.71	0.59	0.05	0.06	0.04	0.03	0.04	0.04	0.66	0.84	0.77

Source: authors' calculations

The unit of analysis is non-consolidated financial statement with the aim to assess the state of the each company and to assess the state of the dairy industry. Separately, the subject of analysis is a consolidated financial statement of the market leader because of its size and cross-border business. Market leader's (Imlek) consolidated data contain data of Imlek Belgrade, Imlek Boka Montenegro, AD IMB Mlekara Bitola, IMK Kumanovo, Macedonia and East Milk Sarajevo Bosnia and Herzegovina.

The next research question addressed in this paper is how the dairy industry in Serbia operates compared to the rest of the Serbian market, measured by Belgrade Stock Exchange indices, by the use of the Business Excellence Model - BEX. The chosen model has not yet been applied to research the dairy industry in Serbia.

Serbian market was represented by 9 non-banking sector companies which were part of the BELEX15 index (leading index of the Belgrade Stock Exchange, which describes the movement of prices of the most liquid Serbian shares) and 75 non-banking sector companies which were part of the BELEXline (general, benchmark index of the Belgrade Stock Exchange), from September 2009 up to date. Because of the strong impact, BELEXline was considered also without Oil Industry of Serbia (NIIS).

Business excellence model - BEX model

BEX model is one of the models based on balance indicators. It aims to enable fast and simple assessment of business excellence of the companies (Belak and Aljinović-Barać, 2007). BEX index is measured according to the following formula (Belak and Aljinović-Barać, 2008):

$$BEX = 0.388\ ex_1 + 0.579\ ex_2 + 0.153\ ex_3 + 0.316\ ex_4,$$

With:

ex_1 - earnings before interest and taxes / total assets

ex_2 - net operating profit / equity capital • capital price

ex_3 - working capital / total assets

ex_4 - 5(net profit + depreciation + amortization) / total debt

To calculate the parameter ex_2 cost of capital of 9 % was used. Non-risk interest rate of 9 % was calculated based on the expected annual inflation and the credit rating of Serbia (Vučković, 2010). The same indicator for the calculation of net operating income was applied for income tax rate of 10 %, which is currently in force in Serbia.

Companies with BEX higher than 6.01 are classified as world class, between 4.01 and 6.00 as excellent - candidate for world class, between 2.01-

Table 2. Serbian dairy industry summary data divided by company size

	Total debt / Capital			ROE			ROA			BEX index		
	2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
Dairy Industry big 5	0.50	0.81	0.75	7.1 %	12.36 %	9.58 %	5.5 %	9.70 %	11.33 %	0.89	1.48	1.56
Standard deviation	0.68	0.95	0.81	0.13	0.09	0.10	0.02	0.01	0.03	0.60	0.70	0.79
Average	0.82	1.10	0.90	16.1 %	13.8 %	10.9 %	7.4 %	10.4 %	10.7 %	1.49	1.85	1.71
Sample	3	5	5	3	5	5	3	5	5	3	5	5
Maximum	1.76	2.97	2.50	0.34	0.27	0.30	0.09	0.13	0.15	1.99	3.15	3.21
Minimum	0.16	0.40	0.35	0.04	0.04	0.02	0.04	0.09	0.07	0.65	1.31	1.01
Median	0.54	0.70	0.50	0.10	0.10	0.09	0.08	0.10	0.11	1.85	1.45	1.55
Dairy Industry medium size (11)	2.27	1.84	1.33	-18.4 %	12.17 %	18.0 %	-0.4 %	7.61 %	10.40 %	-0.21	1.40	1.68
Standard deviation	2.06	2.60	1.64	0.39	0.21	0.16	0.08	0.10	0.10	2.07	1.35	2.08
Average	2.58	2.82	1.70	-24.5 %	11.5 %	18.2 %	3.1 %	9.0 %	12.7 %	-0.29	1.58	2.19
Sample	3	11	11	3	11	11	3	11	11	3	11	11
Maximum	5.32	6.90	5.3	0.04	0.62	0.55	0.13	0.27	0.23	1.55	3.81	5.3
Minimum	0.34	0.16	0.13	-0.79	-0.12	0.00	-0.07	-0.01	-0.14	-3.19	-0.58	-3.2
Median	2.08	1.71	1.01	0.02	0.03	0.20	0.03	0.05	0.14	0.77	1.69	2.26

Source: authors' calculations

4.00 as very good, 1.01-2.00 as good, 0.00-1.00 as border area between good and bad, and companies with BEX lower than 0.00 (negative) as bad (Belak and Aljinović-Barać, 2008).

Profitability and indebtedness of the Serbian dairy industry

Profitability measured by ROE and ROA indicators (Table 1), shows that Serbian dairy industry outperformed profitability of the companies included in the BELEX15 and BELEXline indices in years 2008 and 2009. In 2007, return on equity of the companies which were in the BELEX15 and BELEXline without NIIS, was higher than ROE of Serbian dairy industry. Return on assets indicator was in constantly increase for the dairy industry in period 2007-2009 and for market leader of the dairy industry as well.

However, looking at the mean of the two middle values, i.e. median, it could be seen that for big dairy companies the values of ROE and ROA are almost stable at around of 10 %. Indicators for medium companies showed significant growth in 2009.

On the other hand, a lower standard deviation of ROE and ROA for big dairy companies indicates that the data points tend to be very close to the mean, whereas higher standard deviation for medium sized dairy companies indicates that the data are spread out over a large range of values. Some of the medium sized dairy companies have shown far better results than the average - more than 20 % of ROE and ROA indicators.

Average ratio total debt / capital in all three selected years for the dairy industry was higher than in group BELEX15 but lower than in BELEXline group. Average number of days of receivables was around 60 for the dairy industry and BELEXline group, whereas it was higher for group BELEX15. Looking separately at big and medium dairy companies (Table 2), it could be seen that medium dairy companies have total debt/capital ratio two times higher than the big dairy companies.

Table 1 shows that the influence of a leader is dominant. Moreover, consolidated data suggest that this is a regional player, which greatly exceeds national frontiers.

Effect size on the profitability of Serbian dairies

The econometric research started with dispersion diagram, with the aim to determine whether there is an indication of correlation between company size and profitability (ROA) of Serbian dairies.

Dispersion diagram clearly shows that there is no correlation (linear, square, exponential, etc.) between the analysed characteristics, which means that further econometric research makes no sense. The conclusion that there is no econometric dependence of regression correlation type between the dairy size and profitability (ROA) implies that big dairies generally did not make competitive advantage on the basis of economy of scales.

The effects of sales structure on the profitability of Serbian dairies

Sales structure was analysed from the point of view of the following groups of products: milk, fermented milk products, cheese, and other products (peppers in sour cream, *kajmak*, etc.).

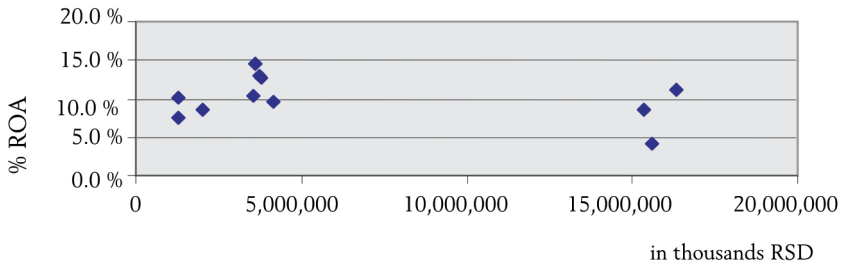

Chart 1. Dispersion diagram for potential dependence of ROA on the size of big dairies (Total assets larger than 1,000,000,000 RSD)

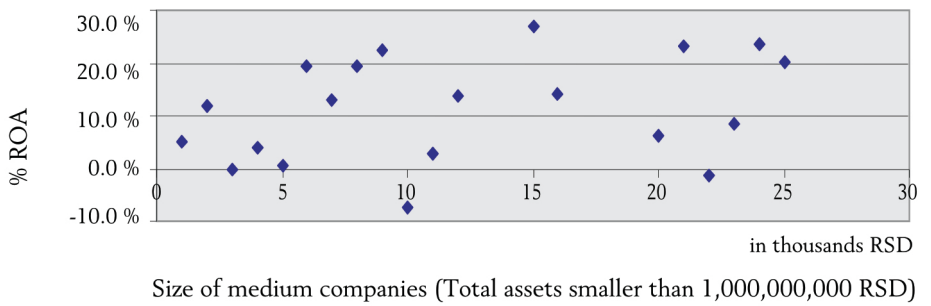

Chart 2. Dispersion diagram for potential dependence of ROA on the size of medium dairies (Total assets smaller than 1,000,000,000 RSD)

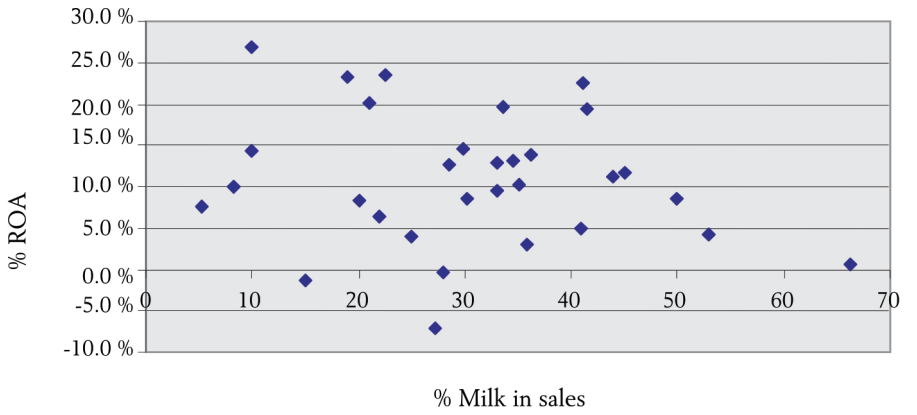

Chart 3. Dispersion diagram for potential dependence of ROA on sales of milk

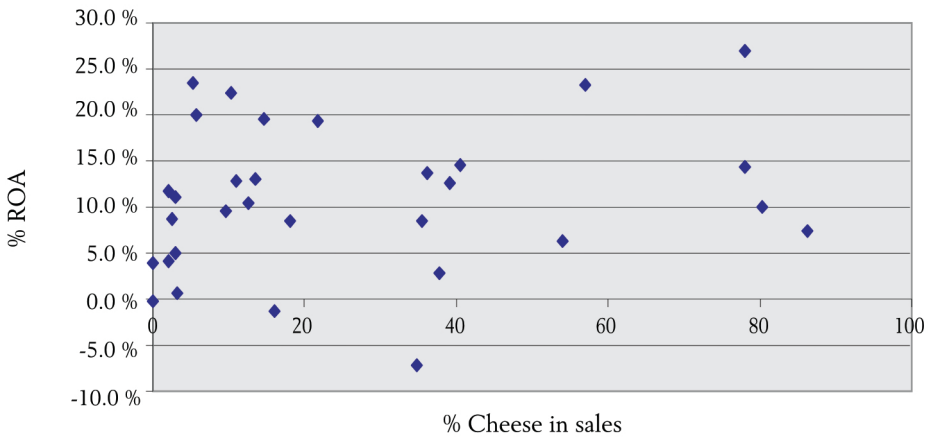

Chart 4. Dispersion diagram for potential dependence of ROA on cheese sales

Chart 5. Dispersion diagram for potential dependence of ROA on sales of fermented milk products

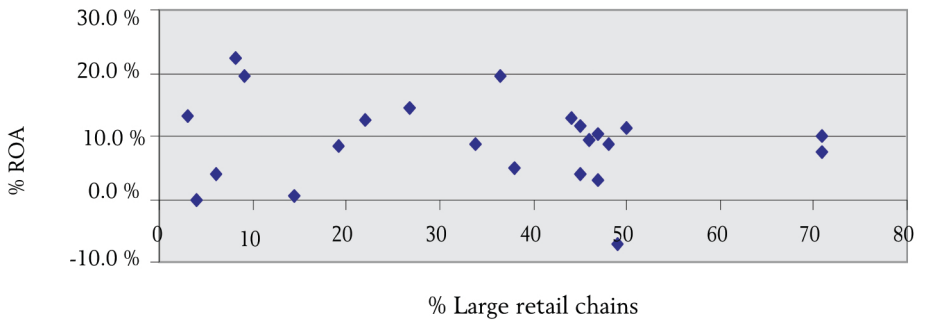

Chart 6. Dispersion diagram for potential dependence of ROA on distribution channels (large retail chains)

Dispersion diagram (Chart 3) clearly shows that there is no econometric regression correlation dependence between the percentage of milk sales and profitability (ROA). This is a surprising finding as it was expected that dairies with lower percentage of milk sales have higher profitability (ROA).

Dispersion diagram (Chart 4) clearly shows that there is no econometric regression correlation dependence between the percentage of cheese sales and profitability (ROA). This is a surprise as it was expected that dairies with higher cheese sales have greater profitability (ROA). This can be explained by a higher share of cheaper cheese in the cheese structure, i.e. a lower margin on gross sales of certain producer, which was a result of low purchasing power.

Dispersion diagram (Chart 5) clearly shows that there is no econometric regression correlation dependence between fermented milk products sales and profitability (ROA).

Impacts of distribution channels on profitability of Serbian dairies

Sales analysis with the emphasis on distribution channels was also carried out. Dairies distribute their products through large retail chains, through a distributor, or directly to medium and small stores, bakeries, hospitals, etc. These data are confidential. Based on the available data, we analyzed whether dairies which sell through large retail chains achieve greater profitability than dairies which sell through other distribution channels.

Dispersion diagram (Chart 6) clearly shows that there is no econometric regression correlation dependence between percentage of sales through large retail chains and profitability (ROA).

BEX model results

Economic viability, i.e. income rate on total assets, measured by EBIT and total assets ratio (ex_1) shows earning capability of an entity.

Table 3. Serbian dairy companies: Total Asset, Net result and BEX in

		Total Asset	Total revenues	Net Result	X1	X2	X3	X4	BEX
Imlek a.d., Beograd	2007	15,612,777	13,123,438	413,261	0,06	0,63	0,05	0,8	0.647
	2008	15,341,715	19,316,962	900,889	0,14	1,47	0,14	1,27	1.332
	2009	16,324,432	17,134,518	867,815	0,1	1,96	0,08	1,15	1.548
Imlek a.d., consolidated	2008	16,691,670	21,828,538	311,43	0,1	0,88	0,12	0,79	0.818
	2009	17,837,882	19,957,055	754,348	0,09	1,81	0,07	1,05	1.430
Mladost Kragujevac	2008	338,967	674,741	839	0,05	2,79	-0,13	0,22	1.688
	2009	433,346	829,416	33,174	0,09	2,36	0,29	1,15	1.811
Mlekara a.d., Subotica	2007	4,183,765	3,002,231	366,075	0,09	1,1	0,14	4,11	1.989
	2008	3,526,462	3,893,842	559,818	0,2	1,45	0,17	3,4	2.017
	2009	3,760,446	3,474,594	260,84	0,1	1,82	0,08	1,86	1.694
Mlekara Leskovac	2008	215,46	211,9	253	0,01	-0,04	0,07	1	0.309
	2009	211,032	192,817	1,56	0,01	0,45	0,08	1,38	0.712
Mlekara Loznica	2008	97,705	235,784	1,701	0,02	0,11	0	0,72	0.300
	2009	88,789	274,324	896	0,04	3,43	0,03	0,73	2.235
Mlekara Plana a.d.	2007	103,898	279,756	1,338	0,01	1,76	0,27	1,55	1.552
	2008	120,976	332,561	2,038	0,02	2,98	0,23	0,96	2.071
	2009	115,449	306,973	1,309	0,02	3,21	0,26	1,12	2.258
Mlekara Šabac a.d.	2007	2,022,697	2,893,781	250,529	0,17	2,34	-0,1	1,41	1.848
	2008	3,790,448	4,175,614	254,976	0,12	5,03	-0,04	0,65	3.155
	2009	3,612,790	4,349,593	311,051	0,14	5,1	-0,07	0,69	3.213
Mlekoprodukt Zrenjanin	2008	1,266,179	1,620,225	54,224	0,1	1,52	0,26	1,11	1.312
	2009	1,285,869	1,529,010	22,756	0,07	1,01	0,32	1,12	1,013
Niška mlekara a.d.	2007	336,518	507,094	-42,247	-0,06	-5,06	-0,4	-0,54	-3.186
	2008	483,31	820,545	435	0,07	2,29	-0,14	0,21	1.399
	2009	543,014	981,667	26,984	0,12	8,73	0,07	0,54	5.285
Somboled	2008	2,715,134	3,516,599	52,811	0,06	1,98	0,12	0,82	1.447
	2009	2,719,752	3,525,870	51,345	0,05	1,13	0,17	1,26	1.098
Mlekara Lazar Blace	2008	294,369	674,323	74,691	0,28	3,88	0,34	4,43	3.808
	2009	360,33	664,932	52,064	0,16	2,01	0,3	2,9	2.188
Valletta d.o.o. Kotraža	2007	231,568	421,868	3,125	0,02	1,03	-0,18	0,63	0.772
	2008	496,032	549,948	4,185	0,06	0,01	-0,11	0,32	0.117
	2009	518,516	430,644	390	0,06	-5,79	-0,26	0,43	-3.230
Milkop d.o.o. Raška	2008	206,729	414,191	16,355	0,09	4,39	-0,23	0,67	2.753
	2009	224,521	744,171	42,599	0,22	6,01	-0,17	1,97	4.164
Kuč-Company d.o.o. Kragujevac	2008	602,548	630,477	-9,988	-0,02	-1,04	0,06	0,06	-0.581
	2009	600,25	831,585	31,214	0,1	3,84	0,09	0,55	2.447
Mlekara Granice Mladenovac	2008	302,486	673,588	60,231	0,22	2,96	0,17	4,42	3.222
	2009	356,102	677,962	75,086	0,23	2,2	0,25	7,02	3.620
Kikindska industija mleka	2008	381,078	721,979	814	0,09	3,73	0,22	0,29	2.320
	2009	442,87	737,768	36,043	0,16	3,73	0,44	0,9	2.573

		Total Asset	Total revenues	Net Result	X1	X2	X3	X4	BEX
Dairy industry (big and medium dairies)	2007	22,491,223	20,228,168	992,081	0,07	0,82	0,04	1,09	0.852
	2008	30,179,598	38,463,279	1,974,272	0,13	1,77	0,11	1,14	1.455
	2009	31,597,508	36,685,844	1,815,126	0,1	2,01	0,09	1,11	1.567
Big dairies	2007	21,819,239	19,019,450	1,029,865	0,07	0,83	0,05	1,16	0.886
	2008	26,639,938	32,523,242	1,822,718	0,14	1,75	0,12	1,24	1.480
	2009	27,703,289	30,013,585	1,513,807	0,1	1,99	0,08	1,12	1.557
Medium dairies	2007	671,984	1,208,718	-37,784	-0,02	-0,28	-0,22	-0,03	-0.211
	2008	3,539,660	5,940,037	151,554	0,08	2,03	0,03	0,6	1.399
	2009	3,894,219	6,672,259	301,319	0,12	2,21	0,12	1,05	1.679
BELEX15	2007	57,691,374	41,742,024	3,286,401	0,09	0,74	0,2	1,34	0.917
	2008	68,870,023	56,201,995	3,329,904	0,12	1,12	0,25	0,9	1.021
	2009	75,702,272	50,378,119	3,507,388	0,09	1,09	0,24	0,88	0.981
BELEXline	2007	431,632,963	382,820,472	13,180,250	0,07	0,57	0,09	0,74	0.604
	2008	477,435,995	453,365,781	5,549,044	0,09	0,95	0,03	0,42	0.724
	2009	460,184,680	367,284,687	-29,465,896	0,01	0,77	0,06	-0,14	0.410
Belexline (without NIIS)	2007	268,936,324	212,978,846	10,312,394	0,07	0,65	0,15	0,77	0.668
	2008	316,829,020	256,689,004	13,571,659	0,11	1,06	0,11	0,69	0.888
	2009	316,133,365	227,273,321	8,170,215	0,08	1,07	0,1	0,55	0.840

Total Asset, Total revenues and Net Result are in 000 RSD.
Source: authors' calculations

In the reviewed model (Belak and Aljinović-Barać, 2008), border value was set at 17.2 %. In the period 2007-2009 the average value of ex_1 for all four examined groups (dairy industry, BELEX15, Belexline and Belexline without NIIS) was under the required 17.2 %. However, the average value of ex_1 for the dairy industry in 2008 and 2009 outperformed other three groups, achieving 13.1 % and 10.3 % respectively. Looking at the values for individual dairies (Table 3), Mlekara Šabac a.d. was with 16.7 % in year 2007 closest to the required 17.2 %. In year 2008, Mlekara Lazar Blace had the highest ex_1 of 28.2 %, followed by Mlekara a.d., Subotica (20.5 %) and Mlekara Granice Mladenovac (21.7 %). In 2009, only two of them had ex_1 more than 17.2 % (Milkop d.o.o. Raška with 22.4 % and Mlekara Granice Mladenovac with 22.5 %). Market leader did not reach the required criteria in all three years. Also, big dairy companies had higher average values of ex_1 than medium dairy companies in all three years.

Indicator ex_2 should be higher than one. This implicates creation of value above capital price, while indicator values lower than one shows that a company is losing its substance (Belak and Aljinović-Barać, 2008). Average value of ex_2 for the dairy industry in 2007 and 2009 outperformed other three groups. In the period 2007 and 2009, the average value ex_2 of the dairy industry was constantly increasing. Looking at the individual values, the highest value of ex_2 was achieved by Niška mlekara a.d. in 2009 (8.73), followed by Milkop d.o.o. and Raška (6.01) in 2009 and Mlekara Šabac a.d. in 2008 and 2009 (higher than 5.00). Imlek a.d., Beograd, the market leader, had value of ex_2 more than 1.00 in 2008 and 2009. Although medium size dairy companies outperformed the big companies, the big ones' average values of ex_2 were also higher in 2008 and 2009. However, it must be emphasized that reviewed ex_2 indicator represents indicator which doesn't have theoretical basis, and is unknown in the literature and business practice (Cvijanović et. al., 2011).

Liquidity indicator ex_3 is shown by working capital and total assets ratio. Model authors emphasize that this ratio should reach 25% or more (Belak and Aljinović-Barać, 2008). In the period 2007-2009, BELEX15 group achieved the highest value of ex_3

indicator. In the year 2008, a 25 % mark was requested. Dairy industry ex_3 indicator was 4.4 % in 2007, 11.3 % in 2008 and 8.7 % in 2009. Looking at the individual values, the dairies exceeded the required criteria, namely Mlekara Plana a.d. (26.9 % in 2007 and 26.3 % in 2009), Mlekoprodukt Zrenjanin (25.6 % in 2008 and 32.0 % in 2009) as well as Mlekara Lazar Blace (34.1 % in 2008 and 29.9 % in 2009). Market leader was under the required criteria in all three years. Average values for both groups, big and medium size dairy companies, were under the requested 25.0 %.

Indicator ex_4 is the one showing the company's financial strength. It is based on the premise that liability should be covered with a five-year free cash flow, which leads to expectations that business conditions remain unchanged in the five-year period. BELEX15 group had the highest value only in 2007 (1.34). In 2008 and 2009, dairy industry had the highest value of this indicator - 1.14 and 1.11. Looking at the individual values, only Mlekara a.d., Subotica had significant value of the indicator ex_4 (4.11 in 2007 and 3.40 in 2008), but it fell to 1.86 in 2009. This dairy company is closely followed by Mlekara Lazar Blace (4.43 in 2008 and 2.90 in 2009) and Mlekara Granice Mladenovac (4.42 in 2008 and 7.02 in 2009). Average values of the indicator ex_4 for big dairy companies outperformed values of indicator ex_4 for medium size dairy companies in all three years.

Finally, a look at the average BEX index values shows that for both BELEXline groups index values are in the border area between good and bad. BELEX15 group outperformed it in 2008 with 1.021. Dairy industry was in the border area between good and bad with BEX index value of 0.852 in year 2007, but it improved in years 2008 and 2009 with BEX index values of 1.445 and 1.567 respectively (area good). Consequently, a constant increase of the BEX index can lead us to the conclusion that certain improvement was made. Market leader was under industry average values.

Average values of BEX index for big dairy companies were better than values of indicator ex_4 for medium size dairy companies in 2007 and 2008. In 2009, medium size dairy companies' average values of BEX index were for 0.12 higher. Lower standard deviation of BEX index for big dairy companies indicates that the data points tend to be very close to the mean, whereas higher standard deviation for medium dairy companies indicates that the data are spread out over a large range of values for all three years.

Individual values show that in 2007 one dairy company was in the so called the bad area (Niška mlekara a.d. with -3.186), market leader was situated in the border area between good and bad with BEX 0.647 and three companies had BEX index between 1 and 2 and were therefore marked as good.

In 2008, one dairy company was in bad area (Kuč-Company d.o.o. Kragujevac -0,581). Three companies lied in border area between good and bad, five companies can be defined as good and seven as very good. The best performer was Mlekara Granice Mladenovac with the index value 3.222.

In 2009, only one dairy company (Valletta d.o.o. Kotraža with -3.23) was marked as bad. Also, one company (Mlekara Leskovac 0,712) lied in the border area between good and bad. Five dairy companies were classified as good, six as very good and two with BEX index value of 5.285 (Niška mlekara a.d.) and 4.164 (Milkop d.o.o. Raška) were classified as excellent candidate for world class. So, each consecutive year there were more dairy companies that were higher ranked. In BELEX15 group, there was no company ranked as an excellent candidate for world class. In BELEXline group, there were 14 excellent candidates for world class and one world class company.

According to the BEX model, companies that have a negative BEX index are facing bankruptcy. In 2009 only the dairy Valletta ltd, Kotraža had a negative index. During 2011 this dairy stopped the production. In 2007 Niška mlekara had a negative BEX index, while the Kuč-Company Ltd, Kragujevac had a negative index in 2008. However, both dairies increased sales significantly and with the BEX index amounting 5.285 in 2008, Niška mlekara was categorized as "excellent - candidate for world class". The inaccurate forecast of the bankruptcy itself cannot be considered a weakness of the BEX model, as there are numerous factors that determine whether a company with an unfavourable financial and rentable position will indeed go bankrupt (Pavlović et. al., 2011).

Conclusion

Profitability of Serbian dairy industry was better than market profitability measured by BELEX15 and BELEXline indices. One of the reasons for this is also market structure and dominant position of market leader, which allows higher prices than on markets in the region leading to a higher profitability.

Results of BEX index lead to the conclusion that some improvements have been made throughout three years. BEX index shows improvements in the dairy industry, big dairy companies and medium size companies, as well. However, it was still not enough to classify some of them in world class range. Hence, there is still room for improvement, especially by increasing the share of products with higher value added. The small capacity usage in medium sized and especially small sized dairies, on one hand, and high growth of some medium sized dairies on the other hand, gives space for further mergers and/or acquisitions, because in the long run it would not be possible for them to exist in the present form.

The size of dairies, share of major product groups in sales and distribution channels on profitability were analysed in this paper. ROA is determined by the structure of production and sales and the chosen distribution channels. The sales structure in this paper was analysed by the following product groups: (a) milk; (b) fermented milk products; (c) cheese; and (d) other products (peppers in sour cream, *kajmak*, etc.), while the distribution channels were analysed from the point of view of large retail chains and other distribution channels. The research, however, did not show an econometric dependence of regression correlation type of any of the above mentioned variables and dairy profitability. This is due to the fact that every group of products contains numerous products which have different profit margins. Naturally, any in-depth analysis is not possible due to the fact that information on price, i.e. profit margin is a business secret.

Export of milk and dairy products made in Serbia is limited to the region within the CEFTA contract. Long life milk and sour cream have the highest rates of export. One of the factors that will definitely affect the Serbian dairy industry in the future is the process of accession of Serbia to the EU and the application of the Stabilisation and Association Agreement. Abolishment of the import tariffs will strengthen the competition. Consequently, the improvements are even more important.

Some distinctive features mark the Serbian dairy market are particularly important: milk consumption per person in this country is five times lower than in Denmark; the structure of consumption is dominated by raw milk and not by dairy products as in developed countries; dairy capacity usage is only 60 %; milk buyout is only 60 % etc. These features make Serbian dairy industry not only a big investment potential, but also a big country development opportunity. Furthermore, the dairy industry is important for national as well as regional economy, which can be proven by the fact that most milk products are consumed in the region of their production and the fact international agricultural is not a relevant factor of the global economic growth.

Profitabilnost i analiza poslovne izvrsnosti mliječne industrije u Srbiji

Sažetak

U radu je analizirano šesnaest mljekara u Srbiji koje predstavljaju mljekarsku industriju Srbije, putem BEX modela u razdoblju 2007-2009. Rezultati su uspoređeni s odabranim tvrtkama koje predstavljaju srpsko tržište kroz indekse BELEX15 i BELEXline, indekse Beogradske burze. Istraživanje je pokazalo da je mljekarska industrija profitabilnija od prosjeka tržišta koje je predstavljeno indeksima Beogradske berze. Profitabilnost mljekara analizirana je s gledišta utjecaja strukture prometa i kanala prodaje. U radu je pokazano da je prema odabranom modelu za procjenu poslovne izvrsnosti, mljekarska industrija bila i još uvijek jest u boljem stanju negoli srpsko tržište općenito, što je čini zanimljivom, ne samo domaćim, već i inozemnim investitorima. Unatoč krizi i nedostacima u organizaciji otkupa mlijeka, poboljšanja u poslovanju bila su postignuta.

Ključne riječi: mljekarska industrija, poslovna izvrsnost, BEX index, analiza profitabilnosti

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