COMPARATIVE FINANCIAL ANALYSIS OF FRUIT AND VEGETABLE JUICE PRODUCTION SECTORS IN SERBIA AND CROATIA

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ABSTRACT

The paper analyzes fruit and vegetable juice production sectors in Serbia and Croatia, with a special emphasis on the analysis of financial performance indicators. Cost-effectiveness, profitability and liquidity indicators over the five-year period have been calculated on the basis of financial data. The aim of the paper is to examine whether there is a statistically significant difference between these indicators in the sectors of the two countries. Having in view that previous research results indicate a lower level of technical effectiveness of Serbian agriculture compared to EU countries, the paper examines the potential of the processing sector in generating new value and the possibility of creating a new product from primary agricultural products with considerably better business results. Based on the statistically significant difference in the mean values of financial indicators, the conclusion is that this sector in Serbia is more liquid and profitable than the counterpart sector in Croatia.

Introduction

Processing industry is among the most important economic branches in Serbia. The division line between the processing industry and other activities in the classification is not clearly drawn. Generally, activities performed within the processing industry imply transformation of materials into new products. Their output is a new product. However, the definition of what makes a new product can be subjective (Regulation on the Classification of Activities (Official Gazette of the RS, No. 54/2010))

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According to the Classification of Activities, production of fruit and vegetable juices is classified in the Processing and preserving of fruits and vegetables group, within the Manufacture of Food Products division in Section C – Manufacturing.

Food industry is important for Serbia, as corroborated by numerous indicators, proceeding from the fact that it is one of the sectors with the greatest impact on industrial production growth, through its share in GDP averaging between 3.7% and 4.3% and its 12% share in the country's total export. (Ministry of Economy, 2017).

The analysis of the situation in the food sector in the Republic of Serbia, made by the Ministry of Economy in 2017, points to the fact that food industry of the Republic of Serbia accounts for 20% of all companies in processing industries and that they employ 21% of the total workforce in the processing industry. What is perhaps even more important is that this sector generates 27% of the total operating income of Serbia's manufacturing and that, unlike some manufacturing industries that operate at net loss, food industry operates with net profit (Ministry of Economy, 2017).

Accelerated technology and its practical implementation to increase production efficiency are the two main components for achieving national security and optimum level of food production (Suresh, A;2015). Having in view a lower level of technical effectiveness of Serbia's agriculture sector compared with the European Union (Djokic at all., 2022), the manufacturing sector is an opportunity for creating new value and for increasing economy's effectiveness and efficiency in the financial sense.

The paper analyzes fruit and vegetable juice production sectors in Serbia and Croatia over a five-year period between 2017 and 2021. The number of companies, revenues and expenditures in the sector are analyzed first. Particular emphasis is placed on the analysis of the financial performance indicators of companies in the sector. Cost-effectiveness, profitability and liquidity indicators, such as net profit margin (N_{pm}), current ratio (T_r) and return on equity (*ROE*) are analyzed based on available data from gross balance sheets of the participants in these sectors.

The aim of the paper is to examine whether there is a statistically significant difference between mean values of these indicators that would lend itself to the conclusion about greater degree of liquidity, cost-effectiveness and profitability in one of these two countries.

Having in view that previous research results indicate a lower level of technical effectiveness of Serbian agriculture compared to EU countries, the paper examines the potential of the processing sector to generate new value and the possibility of creating a new product from primary agricultural products with considerably better business results.

Materials and methods

Background information on the number of companies, balance sheet positions and basic financial indicators for the five-year observation period 2017–2021 have been taken from the Orbis database. Balance sheet positions are shown in USD. Current ratio is calculated according to the formula:

$$T_r = \frac{T_a}{T_p}, \quad (1)$$

where

T_r - current ratio,

T_a - current assets,

T_p - current liabilities.

Profit margin is calculated according to the formula:

$$N_{pm} = \frac{N_d}{P_p}, \quad (2)$$

where

N_{pm} - net profit margin

N_d - net profit

P_p - sales receipts.

Return on equity is calculated according to the formula

$$ROE = \frac{D_{po}}{V_k}, \quad (3)$$

where

ROE- return on equity

D_{po} - profit before taxation

V_k - total capital.

Statistical hypotheses on the significance of differences between median values of net profit margin, current ratio and return on equity indicators are tested using T-Test for Independent Groups.

Results

In the past five years, fruit and vegetable juice production sector in Serbia has been recording positive results and a growth trend of all indicators. The number of participants of this segment has doubled, from 30 manufacturers in 2017 to 65 companies in 2021.

Increasing number of manufacturers was accompanied by the growing sales revenue, though not in the same extent. Namely, revenues of the entire sector grew by 24% over the five-year period, as shown in Table 1.

Table 1. Financial data for the fruit and vegetable juice production sector in Serbia

	Years				
	2021 th USD	2020 th USD	2019 th USD	2018 th USD	2017 th USD
Accounting items	**Values**				
Operating revenue (Turnover)	273,882	236,139	211,760	202,146	220,995
P/L before tax	17,181	14,292	22,866	11,015	15,652
P/L for period [=Net income]	15,167	8,039	12,741	10,530	12,583
Cash flow	26,883	19,518	21,766	18,961	21,115
Total assets	373,817	365,647	328,793	295,860	291,474
Shareholders funds	223,771	217,789	203,450	182,186	182,135
Current ratio (x)	1.47	1.66	1.79	1.71	1.85
Profit margin (%)	6.28	6.07	10.81	5.46	7.09
ROE using P/L before tax (%)	7.65	6.56	11.21	6.08	8.58
ROCE using P/L before tax (%)	n.a.	n.a.	n.a.	n.a.	n.a.
Solvency ratio (Asset based) (%)	59.86	59.56	61.88	61.58	62.49
Number of employees	1,964	1,987	1,695	1,611	1,578

Source: Orbis database (2023)

Unlike in Serbia, the fruit and vegetable juice production sector in Croatia has recorded a negative result for the last five years. Despite the 17% revenue growth, the sector continued to operate at loss which amounted to USD 3,612,000 in 2021, as can be seen in Table 2. There was a slight increase in the number of manufacturers, totaling 31 at the end of 2021.

Table 2. Financial data for the fruit and vegetable juice production sector in Croatia

	Years				
	2021 th USD	2020 th USD	2019 th USD	2018 th USD	2017 th USD
Accounting items	**Values**				
Operating revenue (Turnover)	85,309	62,688	72,534	69,542	72,711
P/L before tax	-3,272	-6,788	-1,641	-1,174	-339
P/L for period [=Net income]	-3,612	-6,944	-1,413	-1,397	-691
Cash flow	1,655	-1,424	4,556	3,154	5,254
Total assets	98,318	96,666	88,693	84,460	87,395
Shareholders funds	28,104	22,720	27,514	21,523	24,731
Current ratio (x)	0.99	0.69	0.93	0.77	0.86
Profit margin (%)	-3.84	-10.83	-2.26	-1.69	-0.45
ROE using P/L before tax (%)	-11.21	-27.04	-3.74	-4.86	-0.51
ROCE using P/L before tax (%)	n.a.	n.a.	n.a.	n.a.	n.a.
Solvency ratio (Asset based) (%)	28.59	23.51	31.02	25.48	28.30
Number of employees	392	379	351	319	310

Source: Orbis database (2023)

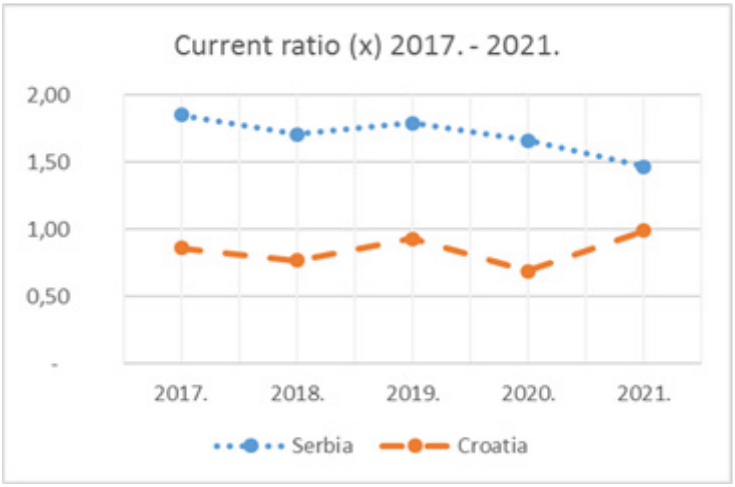
To compare financial performances of these two sectors, statistical hypotheses have been tested. Current ratios have been compared first (Table 3, Figure 1).

Table 3. Current ratio

	2017.	**2018.**	**2019.**	**2020.**	**2021.**	***min.***	***max.***	***average***
Serbia	1.85	1.71	1.79	1.66	1.47	*1.47*	*1.85*	*1.70*
Croatia	0.86	0.77	0.93	0.69	0.99	*0.69*	*0.99*	*0.85*

Source: author's own calculation

Figure 1. Current ratio developments in Serbia and Croatia



Source: author's own presentation

Current ratio, as a ratio of current assets to current liabilities, provides a good first insight into the ability of companies in the sector to meet their obligations on time. This indicator in Serbia ranged from 1.47 to 1.85. Besides a slightly negative trend, the fact that the indicator recorded its minimum in the last year of measurement also raises concern.

In Croatia, the indicator followed a slight upward trend, with its highest value of 0.99 recorded in the last year of measurement. The current ratio value suggests that companies from Croatia have a low level of liquidity and that short-term assets are not sufficient to settle short-term liabilities. The situation in Serbia is considerably better in terms of this indicator, because each USD of short-term liabilities is, on average, covered by USD 1.7 of short-term assets.

To examine statistical significance of the current ratio mean values, the null and alternative hypotheses have been defined:

H0: There is no statistically significant difference in mean values of the current ratio in fruit and vegetable juice production sector between Croatia and Serbia;

H1: There is statistically significant difference in mean values of the current ratio in fruit and vegetable juice production sector between Croatia and Serbia;

The average value of the current ratio in the Republic of Serbia is 1.70 (M=1.70) with standard deviation of 0.15 (SD=0.15), while in the Republic of Croatia it is 0.85 (M=0.85) with standard deviation of 0.12 (SD=0.12).

Table 4. Independent samples t test results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Curent ratio (x) 2017 - 2021	Equal variances assumed	.049	.830	10.022	8	.000	.84800	.08462	.65287	1.04313
	Equal variances not assumed			10.022	7.725	.000	.84800	.08462	.65166	1.04434

T test results, at the significance level of 0.05, suggests the presence of statistically significant difference between the mean values of the current ratio in Serbia and Croatia. More precisely, since Sig. = 0.000<0.05, it led to the conclusion that fruit and vegetable juice production sector in the Republic of Serbia is more liquid than the counterpart sector in the Republic of Croatia.

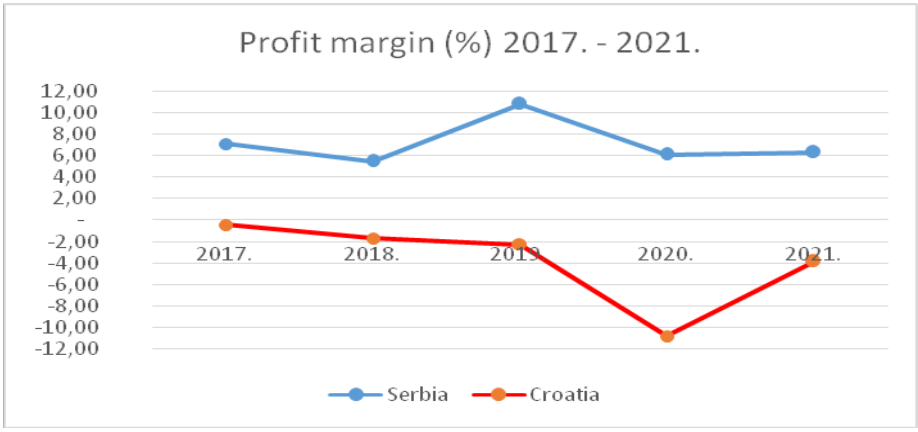
The results of profit margin comparisons of these sectors are presented in Table 5 and Figure 2

Table 5. Profit margin

	2017.	**2018.**	**2019.**	**2020.**	**2021.**	***min.***	***max.***	***average***
Serbia	7.09	5.46	10.81	6.07	6.28	*5.46*	*10.81*	*7.14*
Croatia	- 0.45	-1.69	-2.26	-10.83	- 3.84	*- 10.83*	*- 0.45*	*- 3.81*

Source: author's own calculation

Figure 2. Profit margin developments in Serbia and Croatia



Source: author's own presentation

The sector in Serbia recorded positive business results, with average profit margin of 7.14%. The sector achieved its maximum profit margin of 10.81% in 2019, while the lowest level was recorded in the first year of the covid pandemic. The same sector in Croatia had a negative business result, with the lowest value of -10.83% recorded in 2020.

To examine statistical significance of the profit margin mean values, the null and alternative hypotheses have been defined:

H0: There is no statistically significant difference in mean values of the profit margin in fruit and vegetable juice production sector between Croatia and Serbia;

H1: There is statistically significant difference in mean values of the profit margin in fruit and vegetable juice production sector between Croatia and Serbia;

The average value of the profit margin (%) in the Republic of Serbia is 7.14 (M=7.14) with standard deviation of 2.13 (SD=2.13), while in the Republic of Croatia it is -3.81 (M=-3.81) with standard deviation of 4.11 (SD=4.11).

Table 6. Independent samples t test results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Curent ratio (x) 2017 - 2021	Equal variances assumed	1.035	.339	5.294	8	.001	10.95600	2.06937	6.18402	15.72798
	Equal variances not assumed			5.294	6.010	.002	10.95600	2.06937	5.89439	16.01761

Source: author's own calculation

T test result, Sig. = 0.001<0.05, at the significance level of 0.05, suggests the presence of statistically significant difference between profit margin mean values of fruit and vegetable juice production sectors in the Republic of Serbia and the Republic of Croatia. Based on test results, it can be concluded that companies in this sector in Serbia are more profitable than their counterparts in Croatia.

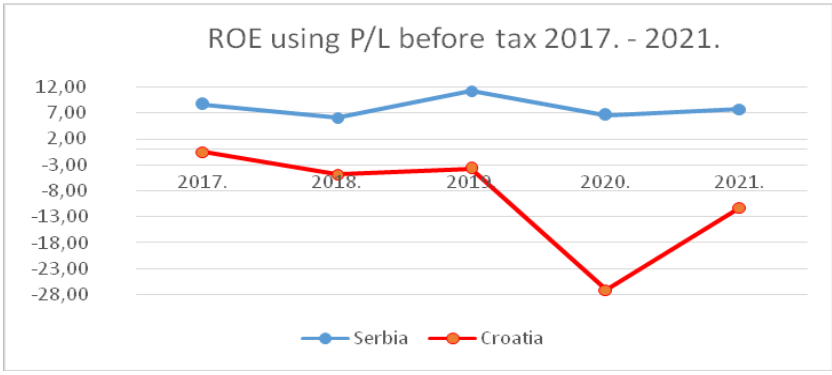
The results of return on equity (ROE) in these sectors are presented in Table 7 and Figure 3.

Table 7. Return on equity (ROE)

	2017.	**2018.**	**2019.**	**2020.**	**2021.**	***min.***	***max.***	***average***
Serbia	8.58	6.08	11.21	6.56	7.65	6.08	11.21	8.02
Croatia	- 0.51	- 4.86	-3.74	-27.04	-11.21	-27.04	-0.51	- 9.47

Source: author's own calculation

Figure 3. ROE in Croatia and Serbia



Source: author's own presentation

In Serbia, companies in the sector brought their owners an average return of 8.02% on invested capital, with ROE maximum value of 11.21% in 2019. Given the negative operating results, the owners of companies in Croatia suffered an average loss of 9.47% on their invested capital. The sector recorded its worst business results in 2020, when ROE fell down to -27.04%.

To examine statistical significance of ROE mean values, the null and alternative hypotheses have been defined:

H0: There is no statistically significant difference in mean values of ROE in fruit and vegetable juice production sector between Croatia and Serbia;

H1: There is statistically significant difference in mean values of ROE in fruit and vegetable juice production sector between Croatia and Serbia;

The average value of ROE using P/L before tax (%) in the Republic of Serbia is 8.02 (M=8.02) with standard deviation of 2.03 (SD=2.03), while in the Republic of Croatia it is -9.47 (M=-9.47) with standard deviation of 10.56 (SD=10.56).

Table 8. Independent samples t test results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Curent ratio (x) 2017 - 2021	Equal variances assumed	5.051	.055	3.636	8	.007	17.48800	4.80947	6.39733	28.57867
	Equal variances not assumed			3.636	4.296	.019	17.48800	4.80947	4.48977	30.48623

Source: author's own calculation

T test result, Sig. = 0.007<0.05, at the significance level of 0.05, suggests the presence of statistically significant difference between ROE mean values of fruit and vegetable juice production sectors in the Republic of Serbia and the Republic of Croatia. Based on test results, it can be concluded that companies in this sector in Serbia generate higher return on invested capital for their owners. Furthermore, it can be concluded that companies in this sector in Croatia make loss on invested capital to their owners.

Discussions and Conclusions

To measure profitability, productivity and efficiency in agriculture sector, various indicators have been used, with certain profitability indicators, such as different value added ratios, being used to compare comparative advantages of agriculture sectors of Canada and the EU (Latruffe, L; 2010).

The economic efficiency is a concept with a complex content, which expresses the effectiveness achieved in an economic activity, in relation to expenses claimed, or the effort to achieve it (Chetroiu; R;2013).

Adequate attention has been paid to the technical efficiency in the agriculture sector. According to the results of the research the technical efficiency in the Western Balkan countries improved in the period 1999/2016, although, however, it is still at a much lower level than in the EU. (Djokić, D. 2022). Making a parallel with the use of the DuPont formula for profitability analysis in the economy, a number of authors point to the importance of interrelationship between profit margin, turnover rate and assets to equity ratio, and therefore propose this formula as the main methodological framework for profitability analysis in the agriculture sector. (Mishra, A.K; at all 2009).

In the whole concept of profitability measurement in the agriculture sector, return on equity (ROE) and return on assets (ROA) continue to have a key role (Mishra, A.K; at all 2012).

As far as the CEFTA market is concerned, Serbian agri-food products have comparative advantages in all Western Balkan countries, while processed agri-food products have a higher level of intra-industrial specialization (Matkovski, B;. at all, 2022). While in relation to the EU countries, this relationship is in their favor.

Serbia achieves a positive foreign trade balance in the exchange of agricultural and food products with EU countries and CEFTA members, while the trade surplus with neighboring countries has been constantly increasing (Dragica, B; 2016).

In view of the current research of profitability and liquidity at the corporate level based on indicators, such as the current ratio, profit margin and return on equity, one can conclude that the present analysis of the fruit and vegetable juice production sector in Croatia and Serbia fully complies with the empirically verified methodological framework and best practice. Primary data, including financial data, were obtained by querying the Orbis database, which is currently the most comprehensive and competent database of business companies in the world.

The results of the research conducted in the fruit and vegetable juice production sectors in Serbia and Croatia lead to the following conclusions:

1. The fruit and vegetable juice production sector in Serbia has, for the last five years, recorded positive financial results and a growing trend in the number of companies in the sector.
2. The sector in Croatia is characterized by a low level of liquidity. Short-term assets are not sufficient to cover short-term liabilities.
3. In Serbia, each USD of short-term liabilities is, on average, covered by USD 1.7 of short-term assets, and the sector is therefore more liquid in Serbia than in Croatia.
4. In Serbia, the sector recorded positive business results with an average profit margin of 7.14%, while in Croatia it recorded an average loss of 3.81%.
5. Companies in the sector in Serbia earned their owners an average profit of 8.02% on invested capital, while owners of companies from Croatia sustained a loss on invested funds that averaged 9.47%.

The results of the research provide a solid base for the above conclusions. They indisputably point to the better performance of the sector in Serbia, being financially more efficient than the same sector in Croatia according to all tested indicators. We consider the mentioned results significant because the financial aspect of the corporate analysis of the Serbian food sector has not received additional attention in a scientific sense.

Conflict of interests

The authors declare no conflict of interest

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