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Internal profitability determinants of organic production companies in Republika Srpska

Интерни фактори профитабилности привредних друштава која се баве органском производњом у Републици Српској

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Abstract: This paper aims to investigate the value and influence of internal profitability determinants on profitability measured by return of assets of organic production companies in Srpska. For this purpose, abbreviated balance sheets of 21 companies engaged in this type of agricultural production in the period from 2014 to 2021 were provided and the regression model was defined. The results showed that the internal determinants of profitability, i.e. company age, liquidity ratio, debt measured by financial leverage, sales growth and capital turnover have a significant impact on profitability. While debt has a negative correlation, other determinants have a positive correlation. Research limitations refer to the sample because it does not include small-scale family farms, which are not required to submit financial reports.
Keywords: profitability, organic production, ROA, sustainability, financial analysis
JEL classification: Q12, Q13, M41

Сажетак: Циљ овог рада је да утврди величину и утицај интерних фактора профитабилности на профитабилност мјерену повратом на активу код привредних друштава која се баве органском производњом у Републици Српској. За ову сврху обезбјеђени су скраћени биланси 21 привредног друштва које се бавило овим видом пољопривредне производње у периоду од 2014. до 2021. године и дефинисан је регресиони модел. Резултати су показали да интерни фактори профитабилности старост друштва, рацио ликвидности, задужење мјерено финансијском полугом, раст продаје и обрт капитала имају значајан утицај на профитабилност и то на начин да левериц има негативан утицај, а остали фактори позитиван утицај. Истраживање је органичено јер узорак не садржи податке о малим породичним пољопривредним газдинствима из разлога што они нису обвезници достављања финансијских извјештаја.
Кључне речи: профитабилност, органска производња, РОА, одрживост, финансијска анализа
ЈЕЛ класификација: Q12, Q13, M41

Introduction

Positive effects of organic production in environmental and health sense are already well known. Organic agriculture was developed as an alternative to conventional agriculture due to the high pollution of soil, water and air, food products that contain pesticide residuals

and generally disturbed ecosystems. Many studies compared the profitability of conventional and organic products with different methodologies but without consensus. The benefits that organic production brings in terms of protecting nature for the wellbeing of all future generations are immeasurable. "The growing demand is mainly attributable to consumer concerns about negative implications of conventional agriculture for human health and the environment." (Meemken & Qaim, 2018). On the other side, insufficiently developed awareness of its importance and potential is still present (Tomaš-Simin et al., 2019). Even if the yield is dominated by conventional manufacturing, organic farming production comes ahead when the benefits and usage are taken into account (Barjaktarovic et al., 2016).

The most critical period for organic production in terms of profitability is the time it takes to convert from conventional to organic production – the conversion period. During that time, producers are faced with high costs and lower production yield (Tomaš-Simin et al., 2019) while consumers would pay the conversion-grade produce around half of a premium price of organic produce (Tranter et al., 2009). There is a lack of consumer research related to organic production purchases in Republika Srpska, although in most cases, 31%-50% of the household budget is used for food purchases (Galić, 2022).

Considering geographical position, climate and land quality, Republika Srpska as entity of Bosnia and Herzegovina has significant potential for organic production, but the current volume of the production shows its initial phase of development. Organic agriculture is suitable for small farms and land areas which are characteristic for this region. Smaller family farms take a very important part of the total agricultural sector of Europe (Beyer & Hinke, 2020).

Profitability in agriculture depends on multiple determinants. Internal profitability determinants are characteristic of the company itself and are mostly influenced by management decisions. They are individual for each company and differ from industry to industry. The ones that affect profitability the most are company size, sales growth, debt ratio, quick ratio, company age, inventory level, fixed assets to total assets ratio, capital turnover (Andrašić et al., 2018) leverage and lagged profitability (Mijić & Jakšić, 2017), with no consensus on the impact (Andrašić et al., 2018).

External profitability determinants are shaped by the business environment: competition, concentration, market risks, gross domestic product (GDP), inflation, unemployment, interest rates, country risks and other influences outside the company.

1. Literature overview

The importance of the agricultural industry for economic growth is represented in the fact that 9.0% of the gross domestic product of Republika Srpska for 2020 is aggregated from agriculture, forestry, and fishing (Statistical Office of Republika Srpska, 2021) and has had a positive index for the past three years. Population census from 2013 shows that agriculture is the predominant economic activity of 34.50% of all households in Republika Srpska (Statistical Office of Republika Srpska, 2017) and agricultural land takes up

981,815 ha or 40.57% of its territory (Ministry of Agriculture, Forestry and Water Management of Republika Srpska, 2021). The agricultural industry is organized into different forms of enterprises – small-scale family farms, cooperatives or companies. The production type, value and structure of assets are different, but all of them are established to bring profit as a precondition for long-term existence and development, followed by the growth of the sector, economic growth, employment, innovation and technological changes (Mijić & Jakšić, 2017). Products are delivered to customers through various distribution channels (Sudarević & Galić).

According to FIBL data, organic production in Bosnia and Herzegovina in 2021 was present on 2.495ha (including in-conversion areas) which makes 0.14% of the total arable land, while the collection of wild plant species took place on 195.668ha, which together gives the 198.163ha of organic areas on the territory of Bosnia and Herzegovina (Willer et al., 2023). Compared to 2020 data, the area of agricultural land has grown by 47.50% (Willer et al., 2023). The same report shows that this increase is 627.8% for the past 10-year period. The growth is a positive indicator, but organic agriculture production still remains low even if it is identified as a comparative advantage, has favourable conditions and a possibility for the development of new economic activities (Mujčinović et al., 2017).

Profitability as a measure of a company's success has been analysed in numerous studies. As a key indicator of company's performance (Pjanić et al., 2018), profitability indicates the ability to generate a profit in relation to investment. Quality of financial reports and disclosures of agricultural companies influence profitability calculations and can be crucial for business activities (Mirović et al., 2019).

The financial position of the majority of legal entities from the agricultural sector of Republika Srpska in the period 2010-2012 had a border rating between poor and acceptable (Stojanović & Stojanović, 2015). Return on assets in the period 2011-2014 measured for Bosnia and Herzegovina was 4.45%, which is the lowest ratio compared to the other countries of Southeast Europe (Mijić & Jakšić, 2017) In the subsequent years (2012-2015), one-third of the enterprises from the sector were financially inefficient and had negative financial results (Vaško et al., 2018). Profitability measured by the average return on assets of cooperatives in Republika Srpska in the period from 2014 to 2018 was negative, and for other agribusinesses it was 0% (Stojanović & Knežić Roković, 2021).

Using the panel data method, Mijić & Jakšić (2017) analysed the determinants of agricultural industry profitability in Southeast Europe. According to this survey, agricultural enterprises in Serbia and Bosnia and Herzegovina are very similar, both positively affected by quick ratio, lagged profitability and growth, while one more factor – leverage is positively related to profitability in Bosnia and Herzegovina.

Andrašić et al. (2018) investigated the performance of agricultural companies in the region of Vojvodina in the Republic of Serbia for the period 2006-2015. Analysis showed that the average return on assets was 2.99%, the liquidity of the companies was lower than 1 and debt indicator was higher than reference value 1. The empirical research showed a significant impact of company size, current liquidity, debt, market share, sales revenue

growth, insurance and export on return on assets as the main profitability determinants, where company size and debt had a negative impact, but current liquidity, market share, sales revenue growth, insurance and export had a positive impact. Different determinants impact is found in case of meat processing enterprises in Serbia (Dakić & Mijić, 2020) where quick ratio and sales growth have significant positive impact on profitability while age, debt ratio and capital turnover have significant negative return on assets. Size and inventory have insignificant influence.

Companies listed on Banja Luka Stock Exchange as the only stock exchange in Republika Srpska have very low, but positive average return on assets (0.23% in 2017 and 0.58% in 2018) (Jakšić, 2019). According to this survey, analysis indicates that liquidity, growth (measured by sales growth) and previous profitability have a positive and significant impact on profitability, while the size of the company and proportion of fixed assets in total assets have no significant impact.

In recent years agri-food sector worldwide has been faced with multiple challenges: digitalization, new market solutions and innovations, changes in consumer conditions, disruptions in supply and demand, transport limitations due to COVID-19, unstable input and output prices and many others (Apostolopoulos et al., 2021). This caused a drop in profitability for many actors in this sector (Béné, 2020). In 2021, 76.4 ha were under organic agricultural production worldwide, which is 1,6% of total farmland (Willer et al., 2023). The region with the most organic agricultural land is Oceania, the country with the most organic producers is India followed by Uganda and Ethiopia, while the country with the largest market for organic food is United States followed by Germany (Willer et al., 2023).

2. Methodology and data

This study analyses the profitability determinants of organic produce companies in the region of Republika Srpska. The aim is to investigate the relationship between internal determinants of profitability where return on assets (ROA), size of the company, age, current liquidity ratio, debt ratio, sale growth and capital turnover ratio are used in the regression model.

Sample is consisted from 21 agricultural producers registered in Republika Srpska as companies with limited liabilities and cooperatives whose basic activity is organic production (see Table 2). The analysis is based on available short financial statements provided by Intermediary Agency for IT and financial services ad Banja Luka (abbreviated APIF) for the period from 2014 to 2021. Total number of observations is 135, with the remark that the number of legal entities changed in the observed period. The starting point for this research is the year 2014 because the Organic Production Law in Republika Srpska was adopted in 2013 (“Zakon o organskoj proizvodnji, Službeni glasnik Republike Srpske broj 12,” 2013).

Small-scale family farms and cooperatives without financial reports are excluded from the sample. In this study, descriptive statistics and a multi-linear regression model will

be used. Return on assets (ROA) will be used as the dependent variable and size of company, age, current liquidity ratio, debt ratio, sale growth and capital turnover ratio will be used as independent variables. Ratio models are shown in Table 1. ROA will be used as a more suitable measure of profitability to eliminate capital structure. Data is consisted of a number of cooperatives that are established with minimum required capital.

Table 1: Explanatory variables

Dependent variable	**Calculation**
ROA – return on assets	Net income/ Total assets
Independent variables	**Calculation**
Size	Segments 1, 2 and 3
Age	Number of years
Current liquidity	Current assets/current liabilities
Debt	Total liabilities/Total capital
Sale growth	(Current period-previous period sales)/ previous period sales
Capital turnover ratio	Sales/(Assets-Obligations)

Source: the author's calculation

Return on assets (ROA) is an efficiency ratio that measures the ability to generate profit from company's assets. The higher ROA represents the more efficient company management in managing balance sheet assets to generate profits.

Segmentation of the sample is done according to the size of the assets. Segment 1 consists of legal entities with assets below BAM 500.000, segment 2 consists of legal entities with assets between BAM 500.001 and BAM 1.500.000 and segment 3 consists of those with assets value higher than BAM 1.500.001.

Age indicates the number of years the companies have been in the organic production business. Organic production in Republika Srpska was regulated by the Organic Production Law in 2013. Some sample companies were engaged in this business even before it was placed in the legal framework.

The current liquidity ratio is a liquidity ratio that measures the ability to cover companies' short-term obligations with its short-term assets. It is an important performance indicator. The reference value is 2.

Debt as leverage ratio used in this paper represents the ratio between total liabilities and total capital (shareholder equity + reserves + financial result from previous years) and shows financial structure. The reference value is 1.

Sale growth is a measure of the revenue change comparing two periods. It demonstrates the rate of growth and can be positive, neutral or negative.

Capital turnover compares the annual sales to the total capital. In this paper, total capital is calculated as the difference between assets and obligations, which means that reserves and financial results from previous years are included. A capital turnover ratio of less than 1 may indicate future liquidity problems, between 1.5 and 2 indicates good financial ground.

After a detailed analysis of the literature and in accordance with the aim of the research, the following hypothesis is set up:

H1: Internal factors – age, current liquidity ratio, debt ratio, sale growth and capital turnover ratio have a significant influence on the profitability (measured by return on assets – ROA) of organic production companies in Republika Srpska.

3. Results and discussion

Descriptive statistics showed that the return on assets (ROA) of organic production companies in Republika Srpska for the period from 2014 to 2021 the lowest ROA value is -0.48 in 2020, where also the highest value can be identified as 9.59 and refers to a start-up company.

Table 2: Return on assets of organic production companies in Republika Srpska for the period 2014-2021

		y2021	y2020	y2019	y2018	y2017	y2016	y2015	y2014
N	Valid	21	20	20	18	15	14	14	13
	Missing	0	1	1	3	6	7	7	8
Std. Deviation		.82645	2.13802	.18716	.27942	.03249	.08640	.11105	.07483
Minimum		-3.59	-.48	-.44	-1.00	-.03	-.01	-.15	-.12
Maximum		.66	9.59	.46	.39	.08	.29	.33	.17

Source: the author's calculation

Measuring return on assets (ROA) as the average value of all companies per each year, data showed that the minimum value is 0.0217, the maximum value is 0.8500 and the mean is 0.0509750 (Table 3). This leads to the conclusion that organic produce companies can achieve average returns 5.09% calculated as ROA, which is much higher than the average return on assets of companies that are listed on BLSE 0.23% in 2017 and 0.58% in 2018 (Jakšić, 2019) or compared to medium and large companies from the agricultural sector in AP Vojvodina, Republic of Serbia in period 2006-2015 where average ROA was 2.99% (Andrašić et al., 2018). The average profitability of fruit processing companies in Serbia is also lower, amounting to 4.2093% (Dakić & Mijić, 2018), but higher in meat production enterprises at 6.865% (Dakić & Mijić, 2020). On the other side, these findings are in the line with profitability of stock companies and limited liability companies in the agriculture, forestry and fishing sectors of Serbia, where average ROA for the period 2013-2016 was 5.043% (Vržina & Dimitrijević, 2020). Research has shown that ROA is higher in conventional food procedures compared to organic producers (Mitić & Čolović, 2022).

Compared to other industries, the average ROA is much lower than in Serbian cement industry (Marković & Savović, 2022), but higher than tourism sector in AP Vojvodina (Mirović et al., 2022) and the Republic of Serbia (Mitrović et al., 2021).

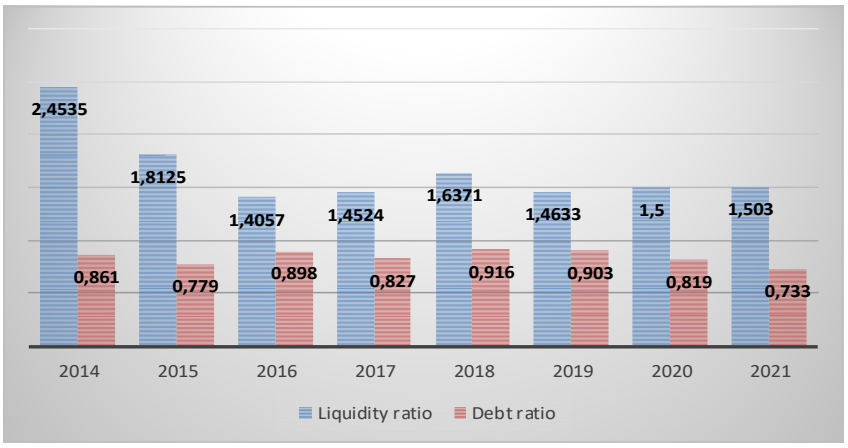
Table 3: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	8	.02170	.08500	.0509750	.02167241
Size	8	3.00	3.00	3.0000	.00000
Liquidity	8	1.4057	2.4535	1.653438	.3484219
Age	8	9.1429	14.0000	10.657888	1.8145400
Sale growth	6	-.1553	.5037	.160617	.2379416
Debt ratio	8	.733	.916	.84194	.064777
Capital turnover	8	1.122	1.703	1.50295	.190839
Valid N (listwise)	6				

Source: the author's calculation

Figure 1 presents values of current liquidity and debt ratios for the tested sample. If the liquidity reference value is 2, results indicate that companies were liquid in 2014 only. Liquidity decrease is present in all subsequent years, especially in 2016, when the bottom value of 1.4057 was reached.

Figure 1: Current liquidity and debt ratios



Source: the author's calculation

In the tested years, average liquidity ratio is 1.5664 and volatility is σ=1.653438, which is below the reference value and lower than the ratio of agricultural companies in AP

Vojvodina amounting to 1.91 (Andrašić et al., 2018). This implies that the analysed companies are not liquid, but with a more acceptable ratio than the agricultural sector in Republika Srpska in previous years (Vaško et al., 2018). On the other side, the debt ratio is less volatile than the liquidity ratio σ=0.84194. The average debt ratio value is 0.84194 (below the reference value of 1), which implies that tested companies were either not indebted or much less indebted than the agricultural sector of Republika Srpska in previous years (Vaško et al., 2018).

Sales growth of the tested sample has a mean value of 0.160617, which is positive growth in sales. The higher rate was calculated on a sample of medium and large agricultural companies in Serbia (Andrašić et al., 2018), and lower on a sample of micro agricultural companies (Tekić et al., 2023).

The calculated capital turnover ratio has a mean value of 1.50295 as an indicator that revenue from sales is higher than total capital, giving good financial ground for future liquidity, which probably lies in the meat industry in Serbia (Dakić & Mijić, 2020).

Table 4: Reliability Statistics – Cronbach's *Alpha Test*

Cronbach's alpha[a]	Cronbach's alpha based on standardized items	N of items
.612	.540	7

Source: the author's calculation

The Cronbach alpha coefficient method was used to measure reliability. Based on obtained results, the test showed that there is a medium strong relation between variables and they are compatible and reliable (Table 4). The use of independent variables is justified.

Table 5: Variance inflation factor

Model		VIF
1	Age	9.182
	Liquidity	3.617
	Debit ratio	2.702
	Sale growth	2.755
	Capital turnover	6.443
	Number of companies	3.505
a. Dependent Variable: ROA		

Source: the author's calculation

Variable selection is checked by the Variance inflation factor test (VIF) and results below 10 indicate that there is no problem of multicollinearity between variables in the model.

The correlation matrix is calculated to determine correlations between ROA as the dependent variable and other independent variables. Calculation represents relations between independent variables too. Results show that the highest and most positive correlation is between ROA and capital turnover. According to that, companies with a higher capital turnover have higher returns on assets which is the opposite of previous research (Dakić & Mijić, 2020). The second strong correlation is between ROA and debt, but it is negative. It implies that companies with higher debt are likely to have lower returns on assets and the opposite. The negative relation between debt and ROA is in a line with previous research (Andrašić et al., 2018). Other variables – age, liquidity and sale growth – have significant and positive correlations with ROA.

Table 6: Correlation matrix

	ROA	**Age**	**Liquidity**	**Debt**	**Sale growth**	**Capital turnover**
ROA	1.000	.486	.313	-.766	.350	.805
sign.	.001					
Age	.486	1.000	.902	-.467	.193	.601
sign.	.020					
Liquidity	.313	.902	1.000	-.134	.475	.575
sign.	.001					
Debt	-.766	-.467	-.134	1.000	.043	-.478
sign.	.002					
Sale growth	.350	.193	.475	.043	1.000	.665
sign.	.004					
Capital turnover	.805	.601	.575	-.478	.665	1.000
sign.	.025					

Source: the author's calculation

Model Coefficients test the impact of independent variables on dependent one (see Table 7). This test directly examines the aim of this research and its hypothesis. According to the results, we can conclude that all independent variables have a statistically significant impact on the dependent variable and therefore hypothesis H1 is confirmed: Internal factors – size of the company, age, current liquidity ratio, debt ratio, sale growth and capital

turnover ratio have a significant influence on profitability (measured by ROA) of organic production companies in Republika Srpska.

Table 7: Model coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.016	.021		3.8741	.029
	Age	-.118	.028	-8.848	- 3.584	.045
	Liquidity	1.795	.017	10.833	4.587	.009
	Debt	-.935	.049	-2.852	-3.584	.036
	Sale growth	.312	.098	3.208	3.29	.040
	Capital turnover	1.122	.108	4.347	4.107	.017
R^2 = 0,597 or 59,7%						

Source: the author's calculation

Multi-linear regression model:

y= - 1,016 - 0,118X1 + 1,795X2 – 0,935X3 – 0,312X4 + 1,122X5

where

X1 – *Age,*

X2 – *Liquidity***,**

X3 – *Debt***,**

X4 – *Sales growth,*

X5 – *Capital turnover*.

The results of the multiple regression model show different direction and intensity impact. Variables age and debt have negative impact as well as previous research (Mirović et al., 2022) (Andrašić et al., 2018; Dakić & Mijić, 2020). Other variables have positive impact with different intensity. These findings are in line with previous research where the regression model indicates that liquidity, company growth and previous profitability have a significant and positive impact on the profitability of companies listed on BLSE (Jakšić, 2019, 52). Opposite to this, there are results which imply that increase of liquidity has negative effect on profitability (Mirović et al., 2022) as well as increase in capital turnover (Dakić & Mijić, 2020). Liquidity, sale growth and capital turnover have positive impact on

profitability, which is in accordance with previous research (Andrašić et al., 2018; Mijić & Jakšić, 2017).

Model results show statistically significant impact of all internal factors on ROA of agricultural enterprises (p-value less than 0.05), accounting for 59.7% of independent variables variations.

Conclusion

The goal of this paper was to investigate the internal profitability determinants and their influence on the profitability of organic production companies in Republika Srpska. For that purpose, data was collected from APIF for the 21 company and the period from 2014 to 2021. Organic produce is still on a low level even if it is identified as a comparative advantage. The average ROA as a measure of profitability is 5.09%, liquidity ratio is 1.65 and debt ratio is 0.84. These findings, together with a positive low sales growth and stable capital turnover, put organic production of Republika Srpska in a positive but economically underdeveloped framework. The empirical research shows a statistically significant impact of company age, current liquidity ratio, debt (leverage ratio), sales growth and capital turnover on profitability measured as return on assets.

The findings provide basic insights into the profitability of organic production companies in Repubika Srpska and identify which internal determinants are crucial for the successful business of the companies. They can be used by management for future business directions and decisions towards enhanced profitability, sustainability, and growth. The increased organic production and optimal financial structure, together with good geographical position and climate conditions, could be a generator of future development of new regional economic and environmental values. A recommendation for improving the agricultural branch is the expansion of organic agricultural areas due to positive company profitability with low volatility.

This research is a pioneer in Republika Srpska and good grounds for all future research that may apply the panel regression model or other suitable models and can be expanded to other internal and external determinants. The results presented do not claim to be representative of the entire sector and area because the sample consists of legal entities registered for this type of production, but without small-scale family farms. These farms do not submit financial reports, therefore they are excluded from the sample.

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