

INFLUENCE OF INDEBTEDNESS ON PROFITABILITY OF AGRICULTURAL ENTERPRISES IN THE REPUBLIC OF SERBIA

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Abstract

Different capital structures and their impact on firm performance are one of the most studied topics in the finance literature. This study is an attempt to assess the impact of financial structure on profitability of agricultural enterprises in the Republic of Serbia, with the aim of evaluating the importance and nature of the contribution of the total, short-term and long-term aspects of debt to the success of the company. The financial performance of the selected sample of 38 medium and large agricultural enterprises in the Republic of Serbia was analysed in the period from 2018 to 2021. The findings of this paper indicate that total debt and short-term debt significantly determine the return on equity, while the effect of long-term debt is insignificant. The nature of the impact of all three aspects of financial structure is negative. The inclusion of size and growth of sales in the regression models showed that only annual sales growth significantly positively determines profitability.

Key words: business success, indebtedness, regression analysis, determinants of profitability, agricultural enterprises

INTRODUCTION

Indebtedness and the size of the company are the two most frequently examined determinants of company success. Different capital structures and their implications on profitability are some of the most represented and discussed topics in financial literature [2]. The previous is also one of the key issues that determines the long-term development of a company, which simultaneously depends on internal (property structure, level of return on total invested funds, level of cash flow and profitability) and external factors such as the amount of taxes and interest paid, the level of competition and information asymmetry [9]. The relatively low accumulation capacity and slow cash turnover in agricultural enterprises emphasise the importance of proper planning and management of the various sources of funding [11]. Therefore, the object of research of this paper is the impact of the financial structure on the profitability of agricultural enterprises of the Republic of Serbia, with the aim of evaluating the importance and the nature of the contribution of different aspects

of debt (total, short-term and long-term) to the success of the company. Since the existing research on the profitability determinants of agricultural enterprises in the Republic of Serbia indicates that there is no relationship between the measures of financial structure and success, this study attempts to disaggregate and analyse the impact of debt by the maturity date [6]. It is emphasized that authors have so far investigated the state of different aspects of indebtedness of agricultural enterprises in the Republic of Serbia [3, 8], however, the focus of the aforementioned studies was not the analysis of its relationship with business success. The breakdown and examination of the impact of individual aspects of debt has so far been carried out in an analysis that included the operations from companies regardless of the sector of economic activity [4]. Selected financial ratios were calculated based on data from publicly available balance sheets and income statements of medium and large agricultural companies for the period from 2018 to 2021 and used as variables in the regression models.

MATERIALS AND METHODS

The sample used for this study included 38 medium and large agricultural enterprises (all large Serbian agricultural companies and about 35% of medium enterprises in the sector), whose predominant activity is classified as sector A - Agriculture, forestry and fishery, according to the Law on Classification of Activities [5] (138 sample units). According to the Serbian Accounting Law [1], companies can be micro, small, medium and large legal entities based on the following criteria (Table 1).

Table 1. Criteria for the classification into enterprise size classes in the Republic of Serbia

Company size	Average number of employees	Business income (euro)	Value of total assets (euro)
Micro	10	700,000	350,000
Small	50	8,000,000	4,000,000
Medium	250	40,000,000	20,000,000

Source: Systematization of authors based on [1].

If the company exceeds the threshold value for a certain size according to two of the three criteria, it is classified in the next group. Similarly, large legal entities are all companies and entrepreneurs that exceed at least two threshold values for the medium-sized group. The mean monthly number of employees includes those working abroad [1]. Large and medium-sized companies are subject to the greatest responsibility in relation to various financial and non-financial reporting requirements, and therefore their reports are assumed to be more reliable, which has led to the exclusion of micro and small companies from the sample of this research. The analysis covers the operations of the companies in the period from 2018 to 2021. By calculating ratio indicators based on financial data from publicly available financial reports published by the Serbian Business Registers Agency, the state of indebtedness and profitability of the sampled agricultural enterprises was determined.

In order to examine the impact of different aspects of the financial structure on

profitability, three regression models were formed with three variables (predictors) each, with ROE (return on equity - the share of net profit in the shareholders' equity in a given year multiplied by 100) as the dependent variable, which is a frequently used measure in previous studies in which the business success of agricultural enterprises was considered [3, 8, 12]. It is also emphasized that ROA (return on assets) is also often present as an indicator of profitability in similar studies, which, in addition also considers assets acquired from borrowed sources [7, 8, 10]. The models include one indebtedness indicator each, namely model 1 - financial leverage (LEV) - ratio of total debt to equity, model 2 - share of short-term debt (SHORT) and model 3 - share of long-term debt (LONG) in total assets. Following the example of the previous research in which the impact of various aspects of indebtedness was considered [4], sales growth and firm size were also included in the regression models as control variables. Sales growth (SALES) is defined as the average annual growth rate of sales revenue, while the logarithm of the value of the company's business assets (SIZE) was chosen as a measure of company size. Accordingly, the following general form regression models were defined:

$$\text{Model 1: } ROE = \beta_0 + \beta_1 LEV_{it} + \beta_2 SALE_{it} + \beta_3 SIZE_{it} + \varepsilon_{it}$$

$$\text{Model 2: } ROE = \beta_0 + \beta_1 SHORT_{it} + \beta_2 SALE_{it} + \beta_3 SIZE_{it} + \varepsilon_{it}$$

$$\text{Model 3: } ROE = \beta_0 + \beta_1 LONG_{it} + \beta_2 SALE_{it} + \beta_3 SIZE_{it} + \varepsilon_{it}$$

where: β_0 is the free term, β_1 - β_3 are regression coefficients, ε is the random error, for company i in year t .

RESULTS AND DISCUSSIONS

The profitability of the sampled agricultural enterprises varied significantly. The average and median rates of return on equity differed slightly (3.36% and 3.24% respectively), while the highest and lowest recorded values were 13.07% and -11.54% (Table 2).

In 18 out of 152 cases, negative profitability was determined, while the largest number of companies (in about 54% of cases) recorded a rate from 0% to 5%. The values of the indicators of the financial structure indicate a relatively low level of indebtedness.

Table 2. Descriptive statistics of variables in regression models

Variable	N	Mean	Median	Std. Dev.	Min.	Max.
ROE	138	3.36	3.24	4.3458	-11.54	13.07
LEV	138	0.63	0.44	0.6634	0.02	3.02
SHORT	138	0.23	0.20	0.1574	0.01	0.74
LONG	138	0.08	0.06	0.0925	0.00	0.42
SIZE	138	20.30	21.35	3.1457	13.62	25.65
SALES	138	6.98	4.72	19.7254	-40.89	63.92

Source: Own calculation.

More than 75% of the considered companies are predominantly financed from their own funds compared to borrowed sources, while short-term is more present than long-term debt. The natural logarithm of the company size records an average value of 20.3 (median 21.35), which corresponds to the value of business assets of about 5.6 million euros. The sales growth rates determined in the period under review are distributed roughly evenly around the neutral rate, with an average of 6.98% (median 4.72%).

The effect of debt on the profitability of agricultural enterprises

The calculated indicator values indicate the existence of at least a weak relationship between all independent and the dependent variable, which is the basic assumption for the application of multiple regression (Table 3).

Table 3. Pearson's (above) and Spearman's (below) coefficients

Variable	ROE	LEV	SHORT	LONG	SIZE	SALES
ROE		-.190*	-.195*	-.105	-.134	.193*
LEV	-.175*		.862**	.515**	.127	-.016
SHORT	-.150	.918**		.193*	.089	-.012
LONG	-.098	.638**	.353**		.158	.069
SIZE	-.206*	.015	-.076	.188*		-.047
SALES	.273**	.022	-.007	.050	.008	

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Own calculation.

The strong link between the total debt to capital ratio (LEV) and the share of short-term

debt is a consequence of the previously mentioned low long-term indebtedness of agricultural enterprises. It is also concluded that the models are free from multicollinearity, since the values of Tolerance and VIF (Variance Inflation Factor) statistics are greater than 0.1 and less than 10.0, respectively for all independent variables (Table 4).

Table 4. Tolerance and VIF (Variance Inflation Factor)

Variable	Model 1		Model 2		Model 3	
	Toler.	VIF	Toler.	VIF	Toler.	VIF
LEV	.984	1.016				
SHORT			.992	1.008		
LONG					.969	1.032
SIZE	.982	1.018	.990	1.010	.972	1.029
SALES	.998	1.002	.998	1.002	.992	1.008

Source: Own calculation.

The results of the regression analysis and the formed regression models point to a statistically significant negative relationship between financial leverage and profitability, and between the level of short-term debt and profitability (Table 5).

Table 5. Regression Models

Models	LEV	SHORT	LONG	SIZE	SALES	Adj. R ²	F
Model 1	-.174** (-1.137)			-.103 (-.143)	.185** (.041)	0.062	4.021*
Model 2		-.183** (-5.058)		-.109 (-.151)	.186* (.041)	0.066	4.215*
Model 3			-.101 (-4.754)	-.109 (-.150)	.195** (.043)	0.042	2.997**

*, **, *** Significant at the 1%, 5%, and 10% respectively.

Source: Own calculation.

The insignificant effect of long-term debt on the success of agricultural enterprises is also found, which is due to its low share in borrowed sources. Nor does firm size significantly influence return on equity. Limitations of the aforementioned conclusion are the exclusive representation of medium and large-sized entities in the research sample. Finally, the observed relationship between the annual sales growth rate and the profitability measure is positive and statistically significant in all three models (at the 5% risk level).

CONCLUSIONS

The results of this study indicate that total debt and short-term debt have a significant negative impact on the profitability of the analysed agricultural enterprises. Proper management and planning of debt is therefore necessary, especially for short-term items, which represent a larger share of borrowed funds. The relatively low representation of long-term debt is primarily related to the unfavourable credit conditions for the agricultural sector in the Republic of Serbia. Overcoming the mentioned limitation requires harmonizing the repayment terms, interest rates and other lending conditions with the specifics (primarily a smaller number of capital turnovers during the year) and the recorded results in the agricultural production. Regression analysis confirmed the importance of sales growth as a determinant of business success. The conclusion about the insignificant contribution of the size of the company is limited by the fact that the research sample exclusively analysed the operations of medium and large entities.

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REFERENCES

- [1]Accounting Law, Official Gazette of the Republic of Serbia, No 73/2019-11, 44/2021-4 (other laws).
- [2]Avcı, E., 2016, Capital structure and firm performance: An application on manufacturing industry. *Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 38(1):15-30
- [3]Denis, K., 2021, Financial stability of enterprises in Serbian agriculture, fishing and forestry sector, *Ekonomika poljoprivrede* 2021, vol. 68(3), 745-758. <https://scindeks.ceon.rs/article.aspx?artid=0352-34622103745K>, Accessed on May 17, 2023
- [4]Janković, M., Jovanović, D., 2016, Influence of leverage on profitability of companies in the Republic of Serbia. In *Contemporary Issues in Economics, Business and Management–EBM 2016: Conference Proceedings*, 233-242.
- [5]Law on Classification of Activities, Official Gazette of the Republic of Serbia, No 104/2009.
- [6]Milašinović, M., Mitrović, A., 2021, Internal determinants of profitability for agricultural companies in Serbia (2020), *Agroekonomika / Agrieconomica*, 49(88), 1-9, <https://agris.fao.org/agris-search/search.do?recordID=RS2021000119>, Accessed on May 17, 2023.
- [7]Milić, D.M., Tekić, D.D., Novaković, T.J., Zekić, V.N., Popov, M.R., Mihajlov, Z.G., 2022, The impact of profitability and productivity on the risk of bankruptcy for agricultural and food companies in Vojvodina, *Journal of Agricultural Sciences (Belgrade)* Vol. 6791), 47-61. <https://doiserbia.nb.rs/img/doi/1450-8109/2022/1450-81092201047M.pdf>, Accessed on May 17, 2023.
- [8]Mirović, V., Kalaš, B., Mijić, K., 2019, Analysis of variations in profitability and indebtedness of agricultural companies in AP Vojvodina, *Facta Universitatis, Series Economics and Organization*, Vol.16(2), 161-169, <https://doi.org/10.22190/FUEO1902161M>
- [9]Stekla, J., Grycova, M., 2016, The Relationship between Profitability and Capital Structure of the Agricultural Holdings in the Czech Republic. *Agricultural Economics*, 62(9):421-428.
- [10]Stoicea, P., Toma, E., Iorga, A.M., Dobre, C., Ignat, R.I., 2022, Implications of turnover on the profitability of medium-sized farms in Romania, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol.22(4), 713-722, https://managementjournal.usamv.ro/pdf/vol.22_4/Art76.pdf, Accessed on May 17, 2023.
- [11]Tomašević, S., 2020, Determinants of profitability of agricultural enterprises in the Republic of Serbia (doctoral thesis), University Singidunum, Belgrade.
- [12]Vukoje, V., Miljatić, A., Tekić, D., 2022, Factors influencing farm profitability in the Republic of Serbia, *Economics of Agriculture*, Vo.69(4), DOI: <https://doi.org/10.5937/ekoPolj2204031V>, a.bg.ac.rs/index.php/EA/article/view/2029, Accessed on May 17, 2023.