ORIGINAL SCIENTIFIC PAPER

Determining theInfluence of Internal Factors on Indebtedness in the Agricultural Sector of Serbia

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ABSTRACT

Indebtedness and its level are one of the most important indicators of the healthy operation of every company. In this study, the authors deal with the analysis of the influence of certain selected internal factors on the level of indebtedness of agricultural enterprises in Serbia. Only large agricultural enterprises were taken as a sample, and the sample itself includes 5702 observations and 87 companies. The subject of the analysis is the annual panel data of large agricultural companies, and the analysis covers the period from 2015 to 2021. In the analysis, the authors used the debt-to-asset indicator as a representative of the company's indebtedness, and it represents the only dependent variable. As independent variables, the authors used indicators of general liquidity, return on capital, return on assets, EBIT level, and equity level. The authors used several diagnostic tests to establish the validity of the regression model. To obtain the results, the authors used the POLS model, the fixed effects model, and the random effects model to determine the influence of independent variables on indebtedness. The results indicated the statistical significance and negative impact of indicators of general liquidity, return on capital, and the level of own capital on the level of indebtedness. The contribution of this paper is that it provides an insight into the relationship of certain internal factors to indebtedness, and it also helps in determining the best level of the relationship between the use of debt and own funds in the financing of the company.

Keywords: *indebtness, debt, internal factors*

JEL Classification: G32, E43

INTRODUCTION

Debt represents a financial commitment owed by one party to another. Debt financing is the practice of borrowing money from lenders such as banks, financial institutions, or bond investors to raise finances for a company or organization. Debt finance can provide businesses with the funds they need to grow operations, invest in new initiatives, or cover current costs. Taking on too much debt, on the other hand, can lead to financial instability and even bankruptcy if the company is unable to make loan payments. Debt financing also entails interest payments and other charges that might have an impact on a company's profitability. There are several very important factors that determine the need for debt financing for certain companies. The economy itself is both debt-led and debt-burdened and so are the businesses inside of that economy (Parui, 2022). Companies can use cash or debt finance sources to realize this increase in their company, which means that there exists a tendency to increase the companies' debt due to the rise in the

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economy (Mukhibad et al., 2020; Buvanendra et al., 2016; Rodrigues et al., 2017; Kaur et al., 2016). Using debt financing, managers can increase enterprise value (Sun et al., 2021). The financial analysis can be used to estimate company development, which is a crucial component of financial management (Tobisova et al., 2022). The company's performance is seen as a source of long-term growth and one of the most crucial variables that investors examine (Vieira et al., 2019). Financial analysis, a crucial component of corporate financial management, can also be used to assess a company's financial performance (Valaskova et al., 2021). Because of its advantageous geographical location, fertile soil, and diverse climate. Serbia has tremendous agricultural potential. The country has a rich agricultural history, and its agricultural industry is important to the national economy. Analyzing Serbian agriculture policies reveals the government's role in structuring the industry and influencing debt factors. Understanding the efficiency of policies relating to subsidies, rural development, land ownership, and market support can help policymakers make recommendations and make adjustments, which is the ultimate goal of this study. In comparison to neighboring EU member states, Serbia has the largest share of agriculture in gross value added and the biggest share of agricultural product exports (Đukić et al., 2017). In the case of Serbia, it is vital to improve product quality as well as align quality with internationally prescribed standards in order to promote competitiveness (Ćurčić et al., 2021).

The paper consists of four major parts. In the first and second parts of the study, the authors present an overview of the used literature and define the methodology and hypothesis used in the research. In the last two parts of the research, the authors present the findings and also discuss the results of the study.

LITERATURE REVIEW

The subject of this research is the effect of internal factors on certain companies' debt levels. Investigating the appearance of debt in the company's operations, it is necessary to first look at the existence of a trade-off between financing with own funds and financing by borrowing. (Gomez et al., 2014). A certain financing structure brings the company exposure to a higher level of risk depending on the ratio of debt and own capital (Salehi et al., 2017). The operation of healthy and successful companies is accompanied by the growth of profitability and liquidity of the company itself, which contributes to economic growth and development. Growing profitability and liquidity levels lead to larger amounts of free cash flow, which also means a greater ability to repay obligations using own funds (Kazmierska-Jozwiak et al., 2015). A liquid company represents a company that is able to repay its obligations from its own funds; its growth leads to a reduction in the use of debt (Ghasemi & Ab Razak, 2016; Kurniawan & Khafid, 2016; Haron, 2016). In the opposite sense, the decline in profitability contributes to the reduction of own funds, thus liquidity, as well as to the increase in the use of debt in relation to equity (Handoko, 2017). The Agricultural sector represents one of the most important industry sectors of the Serbian economy. The agricultural industry faces further issues as a result of rising debt levels, which results in lower net income and stagnation in land values (Patrick et al, 2016). Any business must be able to determine the ideal equity and debt ratio (Royer & McKee, 2020). According to Henning et al. (2019) debt, which is typically available in the form of credit, is specifically what modern agriculture relies on the most.

Numerous studies exist examining the influence and relationship of multiple factors and the company's indebtedness (Waisman, Ye & Zhu, 2015; Badoer & James, 2016; Rahman et al., 2020; Salim & Susilowati, 2019; Avdiljev et al., 2020; De Fiore & Uhling, 2015). The study conducted by Kaur et al, (2016) researched the Agricultural industry in Panjab. They concluded that the primary variables that determine farmers' debt levels are their education level, non-farm income, farm size, and non-institutional credit. According to research by Masavi et al. (2017) on Kenya's agricultural sector, an increase in debt ratio will result in an increase in financial performance, while an increase in debt-to-equity ratios will significantly lower companies' after-tax profits. Capital structure also has an impact on financial performance. In their research on the agricultural

sector of the Czech Republic, Vrbka et al. (2022) discovered that the ideal debt range is 20 to 25%, at which point the cost of capital is estimated to be between 22 and 24%. It would be inefficient for agricultural enterprises to have greater or lower debt ratios. Fenyves et al. (2020) conducted research on the Czech Republic, Hungary, Poland, and Slovakia's agricultural industries. The findings demonstrated that highly profitable businesses required less debt financing, whereas rapidly expanding businesses had less access to the financial system. According to findings from Kuera et al. (2021), the Czech Republic's agriculture industry only benefits from financial leverage up to a certain debt ratio. If the debt ratio falls outside of this range, the financial leverage has an adverse effect, and the ratio of total liabilities needs to be adjusted.

METHODOLOGY AND DATA

The authors in this study empirically research large companies in the agricultural sector of the Republic of Serbia. The conducted research investigates 87 large agricultural companies out of 1128 companies operating in the Republic of Serbia in the period from 2015 to 2021. The companies used were ranked by the number of employees, the size of capital and the amount of revenue. Only large companies were taken as the research subject because of their great influence on the movement of the agricultural sector of the Republic of Serbia itself. The authors started from the assumption that understanding the impact of indicators on the largest companies best reflects the results of the agricultural sector. The data was collected using companies' financial reports and from the Serbian Business Registry. The research uses the panel data approach and investigates the influence of certain internal factors on the company's level of indebtedness.
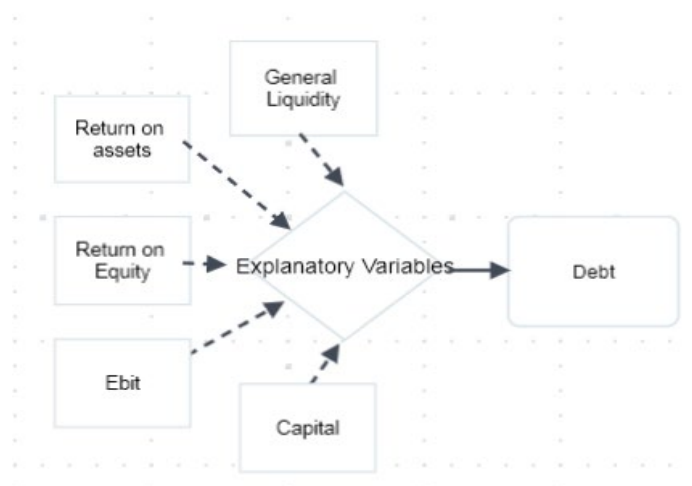

Figure 1. Model construction
Source: Authors

Following the model construction. the authors present the following regression model:

$$Y = \alpha + \beta_1\, Gl_{it} + \beta_2\, Roa_{it} + \beta_3\, Roe_{it} + \beta_4\, Ebit_{it} + \beta_5\, Cap_{it} + \epsilon \qquad (1)$$

Where:
- Y represents the dependent variable Debt
- α represents the constant
- β represent the slope
- Gl_{it} represents the level of general liquidity of company i at time t
- Roa_{it} represents the return on assets ratio of the company i at time t
- Roe_{it} represents the return on equity ratio of company i at time t

-   $Ebit_{it}$ represents the level of earnings before interests and tax of company i at time t
-   Cap_{it} represents the level of capital of company i at time t
-   ϵ represents the error coefficient

As noted in the first part of the study, the authors use five independent variables and one dependent variable in their analysis. In the table below, the authors present descriptive statistics of the variables used. It is notable that 5702 observations were used in the study. Also noticeable is the presence of the highest level of standard deviation in the indicators of general liquidity (GL) and in the indicators of income before interest and taxes (EBIT) and capital. The high level of standard deviation tells us that for these variables, there is the biggest difference between the minimum and maximum amounts during the study period itself. The table below also gives a summary of all dependent and independent variables used in the research.

Table 1. Deskriptive statistics

	Debt	**Gl**	**Roa**	**Roe**	**Ebit**	**Capital**
Mean	0.6074	1.5022	-0.0805	0.0222	9390.95	193032.91
Maximum	2.2699	10.4000	64.7541	1.4926	976322	52479539
Minimum	0.0009	0.0100	-69.6986	-1.6981	-3206545	0
Std. Dev	0.2967	1.3557	3.3353	0.1078	72937.38	1399616.81
Obs.	5702	5702	5702	5702	5702	5702

Source: authors

Following the derived model and a summary of used variables, the authors define the following main hypothesis:

H_0 – Internal factors do not have a significant influence on debt

H_1 – Internal factors have a significant influence on debt

The authors also define five auxiliary hypotheses:

H_2 – General liquidity has a significant influence on debt

H_3 – Return on assets ratio has a significant influence on debt

H_4 – Return on equity ratio has a significant influence on debt

H_5 – Earnings before interest and taxes have a significant influence on debt

H_6 – Capital has a significant influence on debt

In the following part of the research, the authors first conduct a number of crucial diagnostic tests which determine the adequacy of used data for testing. The two most important tests that are used are the correlation matrix (Rebonato & Jackel, 2011), for rejecting multicollinearity and the unit root tests (Peasan, 2012), which are used to determine the stationarity of used data. In the last part of the study, the POLS, Fixed effects, and Random effects models are generated and analyzed using the likelihood ratio (Fan et al., 2001) and Haussman test (Mutl & Pfaffermayr, 2011).

RESULTS AND DISCUSSION

In the methodology section, the authors emphasized the need to satisfy certain diagnostic tests in order to generate an adequate panel regression model. One of the first tests used by the authors is precisely the correlation matrix, which serves to reject the null hypothesis of the existence of multicollinearity in the data. Multicollinearity in itself is a serious obstacle to deriving a valid regression model because it tells us that there is an excessive level of correlation between certain independent variables (Alin, 2010). Looking at the table below, the absence of a correlation level above the 0.7 limit is noticeable. The authors used the limit of 0.7 as a threshold of an excessive

level of correlation and, therefore, the presence of multicollinearity of certain data. As mentioned, since the correlation of the data does not exceed the threshold value, the authors can reject the null hypothesis of the existence of multicollinearity.

Table 2. Correlation matrix

	Debt	**Gl**	**Roa**	**Roe**	**Ebit**	**Capital**
Debt	1	-0.5176	-0.0948	-0.1541	-0.0575	-0.1351
Gl	-0.5176	1	0.0398	0.1673	0.1028	0.0325
Roa	-0.0948	0.0398	1	0.3592	0.0353	0.0049
Roe	-0.1541	0.1673	0.3592	1	0.2029	-0.0075
Ebit	-0.0575	0.1028	0.0353	0.2029	1	-0.2154
Capital	-0.1351	0.0325	0.0049	-0.0075	-0.2154	1

One of the very important tests that must be satisfied to generate a valid panel regression model is the stationarity of the data. The authors use the Levin, Lin & Chu t, Im, Pesaran and Shin, ADF and PP stationarity test for panel data stationarity testing purposes. The condition for rejecting the null hypothesis of data non-stationarity is the limit of a 5% significance level. Due to a large number of observations and the use of a long period of analysis, the results indicate the presence of stationarity already at the level. For this reason, the authors in the table below show only the results of the level analysis and, in the presentation, do not include the results of differentiation, which is one of the main forms of converting non-stationary to stationary data.

Table 3. Unit root summary tests

Variables	Levin, Lin & Chu t	Im. Pesaran, and Shin	ADF	PP
Debt	-65.2691 (0.0000)	-8.1316 (0.0000)	1169.17 (0.0000)	1491.47 (0.0000)
Gl	-51.8921 (0.0000)	-3.2235 (0.0000)	1086.51 (0.0000)	1406.71 (0.0000)
Roa	-97.0019 (0.0000)	-19.1655 (0.0000)	1654.58 (0.0000)	2490.34 (0.0000)
Roe	-285.14 (0.0000)	-23.6722 (0.0000)	1476.56 (0.0000)	2303.69 (0.0000)
Ebit	-35952.6 (0.0000)	-1254.29 (0.0000)	1256.85 (0.0000)	2067.82 (0.0000)
Capital	-33.1101 (0.0000)	-3.4825 (0.0002)	1047.9 (0.0000)	1216.41 (0.0000)

Source: authors

After satisfying the necessary diagnostic tests, the authors present the results of the study itself in the table below. As mentioned in the methodology section, the authors used the POLS model, the fixed effects model, and the random effects model to determine the optimal panel regression model. Below the table of regression results, the authors also show the results of the Likelihood test and the Hausman test, which serve to select the most adequate model. The results of the tests indicated that the fixed effects model is the most adequate model. Based on these results, the authors comment on the obtained results.

Table 4. Panel regression model

Variables	POLS	Fixed effect model	Random effects model
Gl	-0.1097 (0.0000)	-0.0587 (0.0000)*	-0.0649 (0.0000)
Roa	-0.0050 (0.0000)	0.0003 (0.6653)	-0.0007 (0.2222)
Roe	-0.1278 (0.0002)	-0.2696 (0.0000)*	-0.2701 (0.0000)
Ebit	-8.5812 (0.0722)	3.8825 (0.1536)	3.5012 (0.1919)
Capital	-2.6245 (0.0000)	-1.6745 (0.0000)*	-1.8425 (0.0000)
c	0.7806 (0.0000)	0.7045 (0.0000)*	0.7507 (0.0000)
R - squared	0.2899	0.8827	0.2263
Probability	0.0000	0.0000	0.0000

Source: authors

Table 5. Likelihood ratio and Hussman test

Likelihood ratio			
	Statistic	**d.f.**	**Probability**
Cross section F	25.147787	(953.47)	*0.000*
Cross section Chi-square	10266.6522	953	*0.000*
Haussman test			
	Chi-sq Statistic	**Chi-sq d.f**	**Probability**
Cross section random	17499.4915	5	*0.000*

Source: authors

The results of the panel regression model indicated a statistically significant and negative impact of general liquidity (GL), return on capital (ROE), and the level of own capital on the indebtedness of large agricultural enterprises. A 1% increase in the general liquidity ratio (GL) leads to a 0.05% decrease in indebtedness. These findings are in accordance with the findings of (Lipson & Mortal, 2009; Bilgin, 2019). The results also show that a 1% increase in the return on equity ratio (ROE) leads to a -0.27% decrease in leverage, while a 1% increase in the equity level contributes to a -1.67% decrease in leverage. Similar results were obtained in studies of (Nazir et al., 2021; Alarussi, 2021; Sikveland & Zhang, 2020; Hang et al., 2018). All three types of models show a probability level of 0.00, which confirms the validity of the models themselves. The R2 coefficient shows that in the fixed effects model, as much as 88% of the changes in the indebtedness variable can be described by the used independent variables. Also, an important item is the statistical significance of the constant C, which represents other unused factors that may have an impact on indebtedness. The likelihood ratio measures the relationship between the POLS model and the fixed effects model. The results show a probability level below the threshold of 5%, which shows a higher validity of the fixed effects model compared to POLS. The Haussman test is used to compare the fixed and random effects models, where the results also show a probability below the threshold level of 5%, which indicates a higher validity of the fixed effects model. Summarizing the obtained results, the authors can reject the null hypothesis (H0) and the auxiliary hypotheses H3 and H5, set in the methodology section, and accept the hypothesis (H1) as well as the auxiliary hypotheses H2, H4, and H6. The results of the study depict only large agricultural companies in Serbia. Large companies have the largest trade-off between liquidity and profitability of companies, so the results are particularly important for the example of large companies. In the case of small and medium-sized enterprises in the agricultural sector of the Republic of Serbia, a similar ratio of indicators is present, where the importance of ROE, general liquidity and capital indicators is also present, but to a lesser extent. Large companies in the agricultural sector of Serbia increasingly use debt as a means of financing their own operations, while small and medium-sized enterprises depend to a greater extent on state subsidies. The agricultural sector represents one of the most important sectors of the economy of the Republic of Serbia and, as such, deserves special attention. Although the results of the study are expected, they provide an additional basis for creating an adequate strategy for the financing structure.

CONCLUSION

In conclusion, the issue of corporate indebtedness is complex and multifaceted. On the one hand, taking on debt can be a necessary and strategic move for companies that want to finance their growth and seek new opportunities. However, excessive debt can also make companies vulnerable to financial instability, limiting their ability to respond to changing market conditions and jeopardizing their long-term viability. Therefore, companies must approach debt management with caution and foresight, carefully weighing the potential benefits and risks of taking on debt and implementing effective strategies to manage and reduce debt burdens over time. In this study, the authors analyzed the influence of certain internal factors on the indebtedness of agricultural enterprises. Understanding the elements that contribute to

agricultural debt is critical for guaranteeing farmers' and the agricultural sector's financial viability. By identifying the fundamental causes of debt, academics may provide significant insights to policymakers, financial institutions, and farmers themselves in order to establish efficient debt management methods and processes, as well as assistance for further risk management and sectoral competitiveness. This study's subjects were internal factors such as general liquidity, return on assets, return on capital, the level of own capital, and the level of profit before interest and taxes. The results of the study indicated the greatest statistically significant, negative influence of general liquidity, return on capital, and the level of own capital on the level of indebtedness of agricultural enterprises. This study serves as a precise insight into the exact influence of selected factors on indebtedness and helps in the formation of the optimal ratio of debt and own capital in the financing of agricultural enterprises. The limitations of the study are the analysis of only the domestic market and the use of only internal factors in the analysis, while the author's proposal for further analysis is a comparative analysis with the markets of other countries as well as the analysis of small and medium-sized agricultural enterprises.

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