ESTIMATION OF PROFITABILITY FACTORS OF MILL COMPANIES IN VOJVODINA
OCENA FAKTORA PROFITABILNOSTI MLINSKIH PREDUZEĆA U VOJVODINI

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ABSTRACT

The subject of this research is mill companies that operated on the territory of Vojvodina in 2019. The aim of the research is to assess the profitability of the observed companies, as well as financial indicators that affect profitability. A sample of 23 small and medium-sized mills was taken and profitability indicators were calculated: return on assets and return on capital, as well as financial indicators: liquidity, indebtedness, solvency and productivity. Based on the calculated indicators of descriptive statistics, it was determined that the median value of the return on assets was 2.58%, and the median value of the return on capital was 5.56%. The influence of factors on profitability was analyzed by applying regression analysis, and the return on assets and return on capital appeared as dependent variables in the models. The significance of the formed regression models was tested by applying regression variance analysis and it was determined that the model containing the return on assets as a depended variable is statistically significant, while the model containing the return on capital as a dependent variable is not statistically significant. Of the observed profitability factors, only the indebtedness indicator stood out as significant.

Key words: profitability, mill companies, food industry, regression analysis, Vojvodina

REZIME

Predmet ovog istraživanja su mlinska preduzeća koja su poslovala na teritoriji Vojvodine 2019. godine. Cilj istraživanja je da se oceni profitabilnost posmatranih preduzeća, kao i finansijski indikatori koji utiču na profitabilnost. Uzet je uzorak od 23 mala i srednja mlinska preduzeća i izračunati su pokazatelji profitabilnosti: stopa povrata imovine i stopa povrata kapitala, kao i finansijski indikatori: likvidnost, zaduženost, solventnost i produktivnost. Na osnovu izračunatih pokazatelja deskriptivne statistike utvrđeno je da je medijalna vrednost stope povrata imovine iznosila 2,58%, a medijalna vrednost stope povrata kapitala iznosila je 5,56%. Uticaj faktora na profitabilnost analiziran je primenom regresione analize, a kao zavisno promenljive u modelima figurirale su stopa povrata imovine i stope povrata kapitala. Značajnost formiranih regresionih modela testirana je primenom analize varijanse regresije i utvrđeno je da je model koji sadrži stopu povrata imovine statistički značajan, dok model koji sadrži stopu povrata kapitala kao zavisno promenljivu nije statistički značajan. Od posmatranih faktora profitabilnosti kao značajan izdvojio se jedino indikator zaduženosti.

Ključne reči: profitabilnost, mlinska preduzeća, prehrambena industrija, regresiona analiza, Vojvodina

INTRODUCTION

According to *Živković* et al. (2014) there has been a change in the food sector, driven by changes in lifestyle, eating habits and demographics. These changes have also affected the financial position of all food companies including mills companies (*Tekić et al., 2020*). Due to the above, it is very important to investigate the financial success of each company. The financial success of a company is usually measured by profitability. Profitability is the ability of a company to make a profit and one of the main goals is to increase the profitability of the company and identify factors that affect profitability (*Pervan and Mlikota, 2015*). In our county, several authors have dealt with determining the profitability factors of food companies. The analysis of the profitability factors of coffee processing companies in the Republic of Serbia was carried out by *Nuševa et al.* (2017). In a sample of two large and eight small companies, observed in the period from 2012 to 2015, the authors applied regression analysis. The return on assets was observed as a dependent variable and the results showed that the inventory turnover ratio and market share have a significant impact on the profitability of the observed companies. *Dakić and Mijić* (2018) investigated the determinants of profitability of companies in sector C, group of production and processing of fruits and vegetables that operated in the Republic of Serbia in the period from 2007 to 2015. The authors investigated the influence of internal factors (size of the company, indebtedness ratio, liquidity ratio, inventory turnover ratio, sales growth and capital turnover ratio) on the profitability of the observed companies. Using panel regression analysis, they came to the

conclusion that the profitability of the observed companies is influenced by sales growth, size of the company ad capital turnover ratio. *Milošević-Adalović* (2018) analyzed the factors of profitability of companies in the dairy industry listed on the Belgrade Stock Exchange; the analysis was conducted for the period from 2008 to 2016. Using the multiple regression model, it was determined that the size of the company, financial leverage and book value per share have a statistically significant impact on profitability (measured by the return on assets). *Dakić et al.* (2019) investigated the profitability factors of food companies (for processing meat, fruits, vegetables and meat) that operated in the Republic of Serbia in the period 2007 to 2015. Based on a sample of 657 companies, the authors came to the conclusion that the growth of sales has positive impact on the profitability of all observed companies. In addition, the size of the company affects the profitability of meat and fruit and vegetable processing companies, liquidity affects the profitability of meat and milk processing companies, while the turnover ratio and indebtedness have a significant impact on the profitability of fruit and vegetable a milk processing companies.

The subject of this research are small and medium-sized food companies that operated under the code 1061-production of mill products, which operated in the territory of Vojvodina in 2019. In accordance with the above, the aim of the research is to assess the profitability of mill companies by calculating return on assets (ROA) and return on equity (ROE) and to determine which internal factors (liquidity, indebtedness, solvency and productivity) affect the profitability of the observed companies.

MATERIAL AND METHOD

A sample of 23 small and medium-sized food companies was used in the analysis. The data used in this research were taken from the financial reports of food companies from Vojvodina, which were taken from the website of the Agency for Business Registers of the Republic of Serbia. According to the Law on Accounting ("*Official Gazette of RS", No. 73/2019*), the division of companies by size into micro, a small, medium and large company was performed. Small companies are classified as companies that exceed the values of two of the following three criteria: average number of employees 50, operating income of EUR 8,000,000 and value of total assets of EUR 4,000,000. Medium-sized companies are those companies that exceed the values of two of the following three criteria: average number of employees 250, operating income of EUR 40,000,000 and value of total assets EUR 20,000,000.

The data were first processed with standard statistical tools of descriptive statistics, and then the multiple regression method was applied to determine the impact of the observed internal determinants on the profitability of the observed companies. Regression analysis can be defined as the estimation of the value of a dependent variable based on one or more independent variables (*Mutavdžić, Đorić, 2018*).

The applied regression model has the following form:

$$\hat{Y} = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_p X_{pi} + \varepsilon_i$$

Where $\hat{Y}$- value of dependently variable, $X_{1i}, X_{2i}, \ldots, X_{pi}$ – values of independently variables, while $\beta_1, \beta_2, \ldots, \beta_p$ – partial regression coefficients, showing the influence of individual independent variables on the dependent variable. Parameter α represents the average initial level of the dependent variable, while ε_i represent the model error (*Hadživuković, 1991*). In order to verify the existence of multi collinearity in the regression models, the inflation variance (VIF) and tolerance (TOL) factors were calculated.

Table 1. Description of variables used in statistical analysis

Variable	Type of variable	Calculation
Return on Assets (ROA)	Dependent variable	Net operating result / Total assets
Return on equity (ROE)	Dependent variable	Net operating result / Total equity
Liquidity	Independent variable	Current assets / Current liabilities
Indebtedness	Independent variable	Total liabilities / Total assets
Solvency	Independent variable	Total liabilities / Total equity
Productivity	Independent variable	Operating income / Number of employees

The problem of multicollinearity is considered to be present if the VIF is greater than 5 and 10, respectively, and the TOL is less than 0.2 (0.1) (*Novaković et al., 2016*). To test the statistical significance of the defined model, regression variance analysis was applied. In order to more accurately interpret the obtained results, other indicators are used, such as the coefficient of multiple correlation and the coefficient of multiple determination. The IBM SPSS 20 software package was used for statistical data processing. The variables described in Table 1 were used in the research.

RESULTS AND DISCUSSION

Based on the values of the sample data, the basic indicators of descriptive statistics for the observed mill companies were calculated (Table 2).

Table 2. Descriptive statistics of selected dependent and independent variables

Variable	Median	Minimum	Maximum	Standard deviation
ROA	2.58	-30.75	8.45	0.91
ROE	5.56	-63.30	35.87	0.20
Liquidity	1.30	0.26	12.87	2.68
Indebtedness	0.58	0.05	1.79	0.39
Solvency	1.01	0.01	18.82	4.01
Productivity	17,801.16	3,176.00	40,354.64	9,579.83

Based on the results presented in Table 2, it can be seen that the median value of profitability, measured as the return on assets (ROA), for observed mill companies in 2019 was 2.58%, with large variations, indicating great heterogeneity within the sample, evidenced by the high value of the standard deviation, as well as a wide range of variation (minimum value of 30.75% to maximum value of 8.45%). The median value of the second indicator of profitability, return on total equity (ROE) is slightly higher than the previous one and amounts 5.56%, ranging from -63.30% to 35.8.7%, with slightly smaller variations compared to the previous variable. Liquidity has a median value of 1.30, with also a large interval of variation. The median value of the indebtedness ratio is 0.58, which indicates an unfavorable ratio of total liabilities and total assets The solvency indicator has a median value of 1.01, which is very close to the orientation norm for this indicator, which is 1. The median value for variable productivity was 17,801.16 dinars per employee, with a wide range of variation and a high value of standard deviation.

Correlation coefficients were calculated for the independent variables on the basis of which the regression models are formed, and on the basis of their values a correlation matrix was formed (Table 3).

Table 3. Correlation matrix of independently variables

	Liquidity	Indebtedness	Solvency	Productivity
Liquidity	1.00	-0.71*	-0.21	-0.07
Indebtedness	-0.51	1.00	0.27	0.07
Solvency	-0.21	0.27	1.00	-0.11
Productivity	-0.07	0.07	-0.11	1.00

Based on the results presented in the previous table it can be noticed that the value of the correlation coefficient between indebtedness and liquidity is 0.71, which may further imply the occurrence of multicollinearity, and for this purpose the existence of multicollinearity was checked by calculating the inflation factor of variance and tolerance (Table 4).

Tabela 4. Multicollinerity test

Promneljiva	TOL	VIF
Liquidity	0.74	1.35
Indebtedness	0.91	1.11
Solvency	0.72	1.39
Productivity	0.97	1.03

It can be noticed that all VIF values are below the limit value of 5, i.e. 10, as well as that all TOL values above the limit values of 0.2 (0.1) and it can be noticed that there is no problem of multicollinearity between the observed variables.

In the next part of the research, based on the presented variables, the first regression model was formed, where the return on total assets (ROA) appears as a dependent variable and liquidity, indebtedness, solvency and productivity appear as independent variables. For the calculated model, the significance of the model as a whole was first tested by applying regression variance analysis (Table 5). The null hypothesis in the case of testing the regression model as a whole is: $H_0: \beta_1 = \beta_2 = \cdots = \beta_k = 0$, if this hypothesis is accepted it can be concluded that the model is not statistically significant.

Table 5. Regression variance analysis for the firs model

Model 1	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.087	4	0.022	4.414	0.012
Residual	0.089	18	0.005		
Total	0.176	22			

Based on the results of the regression variance analysis for the observed model, it can be concluded that the null hypothesis is rejected and that the formed model is statistically significant (p<0,05).

The estimated parameters of the first regression model are presented in the following table (Table 6).

Table 6. Basic parameters of the first regression model

Model 1	b*	b	Std. Err. of b	t(2)	p-value
Intercept		0.068	0.049	1.392	0.181
Liquidity	-0.051	-0.002	0.006	-0.263	0.796
Indebtedness	-.0749	-0.173	0.046	-3.788	0.001
Solvency		0.004	0.004	1.046	0.310
Productivity	0.173	1.617	0.001	1.020	0.321

The obtained partial regression coefficients (b) indicate a high statistical significance of the parameter β_2 which profiles the independent variable representing indebtedness. The direction of action of this variable is negative, and it can be concluded that with the increase in indebtedness by one, the value of ROA of the observed companies' decreases by 0.17%. On the other hand, the results of the regression analysis indicate that other independently variables do not have a significant statistical impact on the profitability of mill companies measured by the return on assets. The values of the multiple correlation coefficients and the coefficient of multiple determination were also calculated. The multiple coefficient of determination shows the percentage of the variability of the dependent variable explained by the influence of the selected independent variables. The correlation coefficient of the observed model is 0.91, which indicates the strength of the linear relationship, while the coefficient of determination is 84.95%, which indicates that the variability of profitability with 84.95% is explained by the influence of selected independent variables, while the remaining 15.05% is explained by unexamined factors.

In the next part of the research, another regression model was formed, where the return on equity was chosen as a dependent variable, while liquidity, indebtedness, solvency and productivity were selected as independently variable. As in the case of the first model, the significance of the model as a whole was first tested by applying regression variance analysis (Table 7).

Table 7. Regression variance analysis for the second model

Model 2	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.138	4	0.035	0.831	0.523
Residual	0.748	18	0.042		
Total	0.886	22			

Based on the results of the regression variance analysis for the second model, it can be concluded that the null hypothesis is accepted and that the formed model is not statistically significant (p> 0.05), and the results of this model will not be commented further.

CONCLUSION

Based on the results of the research on the determinants of profitability of small and medium mill companies in Vojvodina for 2019, the following can be concluded: profitability measured by the return on assets has a median value of 2.58%, while profitability measured by the return on equity has a median value

of 5.56% , both indicators show extremely large variations within the observed sample. In accordance with the subject and aim of the research, the influence of various internal factors on the profitability of small and medium-sized companies was determined and two models of multiple regression were formed. Based on the results of first regression model, where the return on assets appeared as a dependent variable, it was concluded that only indebtedness has a significant impact on profitability. It is important to note that based on the results of first regression model, it can be concluded that with the increase in indebtedness by one, the value of return on assets of the observed companies decreases by 0.17%. The second regression model was found to be not statistically significant, and the results of this model were not commented on.

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