ECONOMIC THEMES (2021) 59(4): 461-477

DOI 10.2478/ethemes-2021-0026

# IMPACT OF DEBT MANAGEMENT ON PROFITABILITY OF LARGE NON-FINANCIAL FIRMS IN SERBIA

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UDC 658.155:005.334(497.11)

Original scientific paper

**Abstract:** Profitability is substantial for any firm to maintain business and enable long-term sustainability. Firms' decision on indebtedness and capital structure have influence on potentials for prosperity, growth, and development. This study aims to find a new empirical evidence on the influence of debt (debt ratio and debt to equity ratio) on firm profitability (ROA), with application to 50 non-financial firms with highest revenues in Serbia in 2019 during 2016-2019 using multiple ordinary least squares regression model. After control for size, liquidity and tangibility of assets, the results find statistically significant correlation and negative influence of debt ratio and capital structure on firm profitability.

Received: 28.04.2021
Accepted: 17.11.2021

**Keywords:** total debt, capital structure, firm profitability in Serbia

**JEL classification:** G32, C36

## 1. Introduction

The adequate level of profitability is a measure of a long-term firm prosperity and sustainability and is the central indicator of the performance of a firm. There are many papers in literature examining corporate finance which are focused on the channels through which firm profitability can be increased. There is no universal formula to explain why profitability varies among firms and industries.

In literature, there are various research about the effect of debt management on firm performance and there are many theories for optimal capital structure. Modigliani and Miller (1958) proposed the irrelevance of capital structure. MM theory proposed that firms are operating on perfect capital markets and assumed the absence of taxes, bankruptcy and agency costs and asymmetric information. As

firms are operating on perfect markets, the value of firm is unaffected by how that firm is financed. Modigliani and Miller (1963) revised their initial MM theory proposing that capital structure is relevant and that relationship between debt and profitability is positive. The new view proposed that firms with better access to debt are privileged as increasing debt provides valuable tax shields that increase firm value. But that does not mean that firm should seek to maximize debt. Trade-off theory Myers (1984, p. 589) implies that capital structure is structured as a compromise between benefit and financial costs from using debt and own capital, considering market imperfections such as bankruptcy and agent costs. Empirical implication of the Incentive-Signaling Approach Ross (1977, p. 23) is that the values of the firm will rise with leverage, since increasing leverage increases the market's perception of the value. When managers possess inside information, then the managerial choice of financial structure will make signals information to the market and the issue of debt will be understood as a positive signal of firm's expectation. Pecking-order theory Myers and Majluf (1984) states that there is no optimal capital structure. This indicates that the asymmetric information exists as managers know more about their firm's prospects, risks, and value than outside investors. "Asymmetric information creates the possibility of a different sort of cost: the possibility that the firm will choose not to issue, and will therefore pass up a positive-NPV investment" (Myers, 1984, p. 584). When the management has superior information comparing to external investors and seek external financing, the firm should first issue debt than equity.

Baker and Wurgler (2000, p. 2248), the authors of market timing, stated that there is no optimal capital structure. Current capital structure is strongly related to historical market values and that structure is a cumulative outcome of past attempts to time the equity market.

The mentioned theories are important for capital structure and imply certain relations which are expected between debt and profitability. Irrelevant capital structure (Modigliani and Miller, 1958) state that there is no relation, revised MM theory (Modigliani and Miller, 1963) and Trade-off theory (Myers, 1984) states the positive relation between debt and profitability. Pecking-order theory (Myers and Majluf, 1984) states that internal financing makes the firm profitable and that there is negative relation between debt and profitability. Evolution of firms' leverage is important on the firm level, but also has serious implications on the macroeconomic level, regales the relation between debt and profitability. Central and Eastern European countries do not make an exception.

Typical firms in real sector in Serbia have high level of debt comparing with the equity and are oriented to external source of financing. Based on Milos and Milos study (2015). the goal of this paper is to answer to following questions: what is the impact of debt managing on profitability of non-financial firms in Serbia and is there a statistically significant effect of debt ratio and capital structure on the profitability

of firms in Serbia? Statistically speaking, a significant relation of ratio of total debt and total assets on profitability of largest firms in Serbia is analyzed with regression model, according to the methodology of Stančić at al. (2016). Leverage and its variables constitute the main independent variables for this study. Leverage is defined using debt ratios. Indicators for managing debt are total debt to total assets ratio and total debt to equity ratio.

The rest of the study is organized as follows. Section 2 describes main theoretical and empirical literature that approaches the relationship between debt management and firm profitability. Section 3 presents the analysis of firm profitability in Serbia and relevant market trends as the base for constructing a hypothesis. Section 4 presents the database and methodological background for the analysis, defining variables, and the model estimation approach. Section 5 presents the analysis and discussion and Section 6 presents the conclusion.

## 2. Theoretical and empirical background

The importance of debt for the firm profitability brought mixed empirical findings and has attracted debate which lasts for decades. There is no universal formula to explain why profitability varies among firms and there is no consensus on relationship between debt and profitability. A summarized review by a chronological order of the most recent empirical papers with the application on European semples is presented in Table 1.

**Table 1 - Review of the empirical literature**

| **Author/s** | **Sample** | **Period** | **Dependent variable** | **Result** |
|---|---|---|---|---|
| | | Method | Independent variable | |
| Baum, Schäfer & Talavera (2006) | **Germany** non-financial firms | 1988-2000 | **ROA** | Firms which rely on short term debt have higher profitability |
| | | GMM | Cash/TA, Sales/TA, ST/TL, ST/TA, LT/TA, (ST+LT)/TA | |
| Kebewar (2012) | **France** Service firms | 1999-2006 | **PROF1, PROF2 ROA** | Leverage does not effect profitability |
| | | GMM | DT, Tang, Tax, Growth | |
| Gabrijelčić, Herman | **Slovenia** non- | 2001-2013 | **EBIT/TA% EBITDA/TA %** | Negative effect of leverage on profitability |

| | | | | |
|---|---|---|---|---|
| &Lenarcic (2013) | financial firms | FE | Finliab/TA %, Foreignfinliab/TA %, Size, Age, Tang%, Product, LR %, Sales growth %, Int exp % | |
| Adair & Adaskou (2015) | **France** SME | 2002-2010 | **DR** | Negative effect of leverage on profitability |
| | | QGLS | Size, Age, Industry, Profitability, Growth Opportunities, Guarantees | |
| Vătavu (2014) | **Romania** listed firms | 2003-2012 | **ROA** | Negative effect of leverage on profitability |
| | | GMM | Debt, Tang, Size, Liquidity, Tax, Inf, Risk | |
| Milos and Milos (2015) | **Romania** listed non-financial firms | 2003-2014 | **ROA** | Negative effect of short-term debt on profitability |
| | | FE | STD, LTD, Size, Growth, Tang, LR | |
| Muscettola & Noccarato (2016) | **Italia** SME | 2006-2010 | **ROE, ROA, ROI, ROS, OPD** | In regions with high loan supply - negative effect. In regions with small loan supply –it's the opposite effect – more leveraged firms are more profitable |
| | | Simple linear regression model | DOE, FDA, DR | |
| Stenčić, Janković & Čupić (2016) | **Serbia** Non-financial firms | 2008-2012 | **LTD** | Negative effect of leverage on profitability |
| | | OLS | ROA, Tang, LR, INF | |
| Stryckova (2017) | **Czech** firms | 2014 | **ROE** | Negative effect of leverage on profitability |
| | | Simple linear regression model | DR | |
| Anderson & Minnema (2018) | **Sweden** Consultin g firms | 2012-2016 | **ROA** | Negative effect of leverage on profitability |
| | | OLS FE | TDA, STA, LDA, Size, LR, Age | |

*Source:* Author

Most of the studies which focus on quantifying the connection between debt and profitability used panel data analysis, with OLS, GMM or FE estimation techniques, but their results are contradictory.

Some papers find a negative effect on debt, resulting in lower profitability: Gabrijelčić et al. (2013, p.28) on the sample of non-financial firms in Slovenia, Adair & Adaskou (2015, p.10) on sample of French SME, Vătavu (2014, p.337) on sample of listed firms in Romania, Milos and Milos (2015, p. 231) find negative relationship between short term debt and profitability on sample of non-financial firms in Romania, Stančić, et al. (2016, p. 1321) find the negative effect of the long term debt on profitability (return on assets) on sample of non-financial firms in Serbia, Stryckova (2017, p. 107) finds the negative effect of the debt ratio and ROE on sample of Czech firms, Anderson and Minnema (2018, p.61) on sample of Swedish consulting firms find negative effect of debt (short-term, long-term, total debt) on profitability.

Some authors did not find negative relationship between debt and profitability. Muscettola & Noccarato (2016, p.29) find influence of credit supply on sample of SME in Italy. High credit supply creates negative effect of debt on profitability and low credit supply creates the positive effect. On sample of French service firms Kebewar (2012, p.15) finds that debt does not have any effect on profitability. While authors Baum et al. (2007, p. 29) on sample of German non-financial firms find positive effect of the short-term debt on profitability.

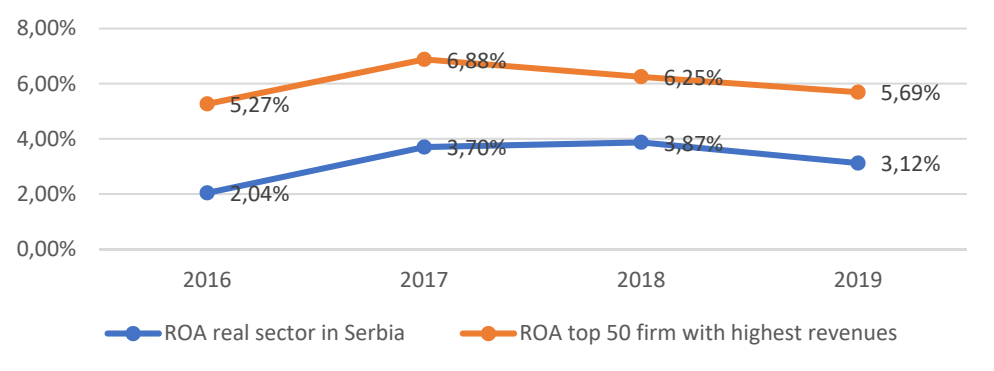
Inconsistent in studies, the results of many authors arise from the following differences in analyzed literature:

- Types of activity and ownership of analyzed firms,
- Countries in which firms are analyzed (developed countries, developing countries),
- Firm size (Large firm or SME),
- Used models (panel regression, GMM, linear regression).

## 3. Profitability of firms with the highest incomes in Serbia

In 2019, the profitability of a firm from the real sector in Serbia, measured by Return on Asset (ROA) was slightly disturbed compared to the previous year. Positive trend from 2014 till 2018 was interrupted in 2019. The decrease in business profitability was the main cause of decreased profitability. Similar trends are present in the US economy and the economies in Western Europe (Jugović et al., 2020, p 57). Figure 1 presents ROA trend in real sector in Serbia and in top 50 firms in 4-year period. ROA of top 50 firms in Serbia with the highest revenues is significantly higher than the average in the whole real sector (Serbian Business Registers Agency [hereinafter SBRA], 2020) indicating that the firm size can influence the profitability.

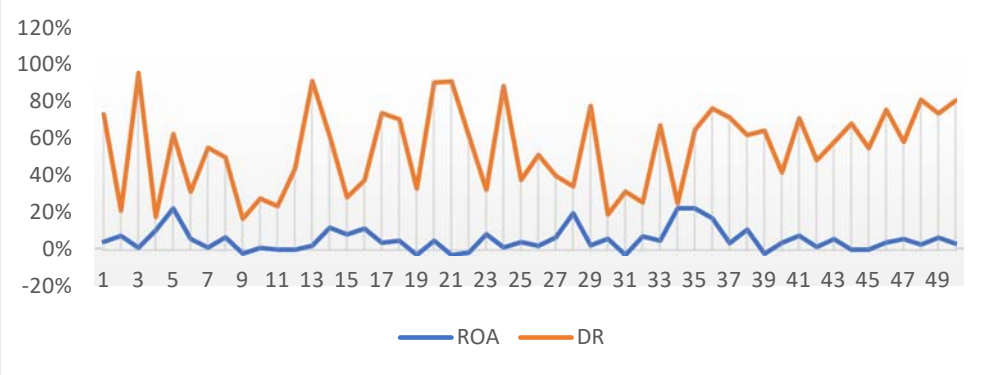
**Figure 1: ROA in real sector in Serbia and top 50 firms in Serbia**




*Source:* Authors' calculation based on data from SBRA

Figure 2 presents the Return on Assets and debt ratio of each of 50 firms with the highest revenues in 2019 in Serbia for 4-year period indicating that there can be a (negative) relationship between debt and profitability.

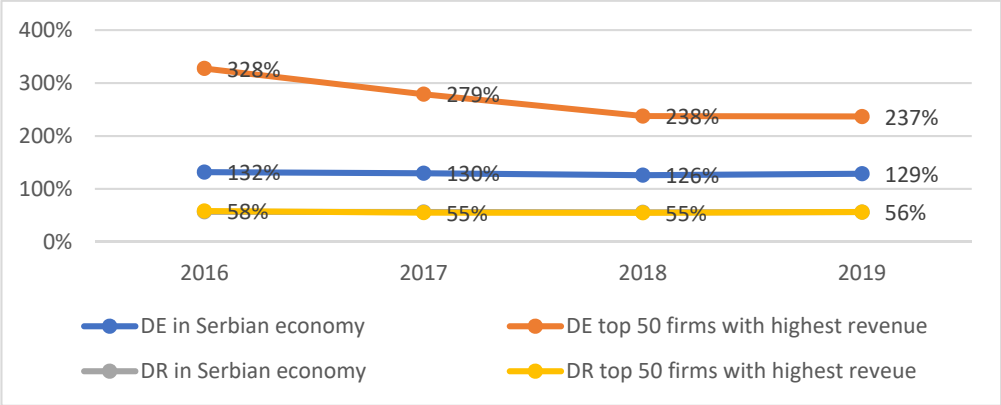
**Figure 2: Relationship between the return on asset and debt ratio - top 50 firms in Serbia in 2019**




*Source:* Authors' calculation based on data from SBRA

The trend in Serbian economy is the increase of total liabilities and leverage. Total liabilities increased by 7% in 5 years (average yearly increase 1,7%), the indebtedness of the real sector is still high, despite the decrease of favorable external source of financing (SBRA, 2020). External financing of the real sector is based on th short term liabilities which in average participate 43% in total assets in the period 2016- 2019. Long term liabilities in average participate 16% in the total assets in the same period.

**Figure 3: Indebtedness trend in thereal sector and top 50 firms in Serbia (average 2016-2019)**




*Source:* Authors' calculation based on data from SBRA

The indebtedness trend of the real sector and top 50 firms in the observed period is shown in Figure 3. The average debt ratio (DR) is 56% on the economy level. Indebtedness, analyzed as the ratio of total liabilities and total assets show a slight decreasing trend due to favorable external situation, mainly a decrease in interest rates and favorable credit terms (Statistical Office of the Republic of Serbia, 2020, p 72). Indebtedness (DE) analyzed as the ratio of total liabilities and equity has a slight decreasing trend till 2018, influenced by a movement in capital structure as the return on equity increased in the observed period by thee average rate of 6,4% (Statistical Office of the Republic of Serbia, 2020, p 72). DE increased in 2019. In the observed period, real sector has a debt higher than equity in average for 29%, while DE ratio is significantly higher in top 50 firms and is in average 270%. According to the Statistical Office of the Republic of Serbia (2020, p. 73) 22,4% of the large firms in 2019 were operating without equity.

## 4. Data and methodology

The subject of the paper is analysis the impact of debt on profitability of 50 firms with the highest revenues in Serbia in period 2016-2019. The goal is to determine if ratio debt to assets and debt to equity influence the profitability of the observed firms in the presented period. Leading by research conducted by Stančić at al. (2016) sample consist of 50 firms with highest revenues in 2019. The data used in this study is secondary data. The collection was done using the database SBRA and portal B2B Online. However, the final database was put together manually, computed, and constructed by the author, including the manual calculation of ratios. The final

sample of companies was defined after using four deletion filters. Firstly, there were selected 50 non-financial firms with the highest revenues in 2019. Secondly, the active companies. Thirdly, the available data for the considered period (2016-2019) and lastly, firms that did not have loss above excess capital. The observed 50 firms with their business revenues participate with 18,67% in the total market share of the real sector revenues in Serbia in 2019. The sample consist of 50 firms (N=50) which were studied over four-year period (T=4), and which resulted in the total of maximum 200 observations for the basis of the study.

The selection of dependent and independent variables was based on the literature analysis.

There are numerous varying techniques for measuring profitability. Profitability is a dependent variable in this research and is usually measured by Return on Equity (*abbreviated* ROE) and Return on Assets (*abbreviated* ROA). In this research, they chose ROA, which is a simple measurement of the firm profitability and determines firm's ability to generate profit based on asset management. This study will use a common and well-known measure of ROA: Return on Assets (ROA) = Net profit / Average Total asset (Malinić at el. 2013, p. 114). As a relationship between profitability and indebtedness - measures may differ. This study will include two independent variables debt ratio (DR) and ratio debt to equity (DE) to ensure that the results are meaningful for achieving the purpose of the study. The total (short and long term) debt in total asset (DR) is an independent variable which is calculated as the ratio of total debt and total asset. The second independent variable is the ratio of total debt and total equity (DE) and is included in the study to analyze its influence on profitability.

Based on the previous studies in model are included control variables. The control variables are there to improve the model and help explain the profitability of top 50 firms in Serbia that are not captured by debt.

The indicator of Assets size (Size) is the logarithm of assets which indicates the influence of Assets size on irm profitability. The results are not consistent between the authors. Kebewar (2013, p.9) did not identify any relationship between the firm size and profitability, while the authors Gabrijelčić et al. (2016, p.28) and Anderson & Minnema (2018, p.61) identified a positive relationship; In addition, Margaretha & Supartika (2016, p.134) identified that the relationship is negative. The indicator of liquidity (LR) as the ratio of short-term assets and short-term debt is also the variable used in the studies to determine the influence of debt management to profitability. The results, also, are not consistent. The author Gabrijelčić et al. (2016, p.24) identified a positive and the authors Milos and Milos (2015, p.232) a negative relationship, while Andersson & Minnema (2018, p.57) did not identify any relationship. Stančić, et al. (2016, p. 1321) did not find a relationship between liquidity and profitability among production firms, but found a positive relationship among service firms. The third control variable is assets tangibility (TANG): total

tangible assets / total assets. Stančić et al. (2016, p. 1322) identified a negative relationship between materiality and indebtedness in production, but not in service industries. Finally, Vătavu (2014, p.335) identified a negative relationship between materiality and profitability.

Therefore, we formulated the following research hypotheses:

*$H1_0$ Null hypothesis:* There is a negative and statistically significant relationship between total debt and profitability.

*$H1_1$ Alternative hypothesis:* There is no statistically significant relationship between total debt and profitability.

*$H2_0$ Null hypothesis:* There is a negative and statistically significant relationship between debt-to-equity ratio and profitability.

*$H2_1$ Alternative hypothesis:* There is no statistically significant relationship between debt-to-equity ratio and profitability.

Our research approach intends to assess the relationship between debt and profitability of the firm, considering the top 50 firms in Serbia based on the highest revenues in 2019. In statistical notation, the regression model can be described as it follows:

$$\mathbf{ROA}_{i,t} = \beta_0 + \beta_1 DR + \beta_{2DE} + \beta_3 TANG + \beta_4 LR + \beta_5 SIZE + \varepsilon_{i,t} \quad (1)$$

Where: ROA is the dependent variable, DE, DR, TANG, LR, Size are independent variables, β is regression coefficient with independent variables, $\varepsilon_{i,t}$ is error term.

## 5. Analysis, result and discussion

The research considered the period from 2016 to 2019. The source of data is the Financial Statements collected from the SBRA database and B2B Online portal. However, the final database was put together manually, computed, and constructed by the author, including the manual calculation of ratios.

The descriptive statistics for the sample is showed in Table 2. The table describes means, standard deviation, minimum values, and maximum values for the included variables. These variables comprise data from 200 observations. ROA acts as the dependent and is central variable for answering the research question. The statistics show that the mean of ROA for firms included in this study is approximately 0,0602 or 6,02%. The mean ROA is partly reduced by the negative ratios of some observations, including lowest ROA at -0,0260 as seen under the minimum column.

It is further reduced as an effect of limiting the max ROA value at 0,2259 after adjusting the outliers in the 95th percentile. However, the mean ROA is similarly positively affected by the limit set on the most negative observations after adjusting to outliers in the 5th percentile. Two debt ratios are of central importance for finding how debt is related to dependent variable ROA and if there is a relationship between debt and profitability – Return on assets.

**Table 2: Descriptive statistics for the sample**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| ROA_wi | 200 | .0602131 | .0663402 | -.026507 | .22592 |
| DR_wi | 200 | .569991 | .2179368 | .270225 | .992058 |
| DE_wi | 200 | 2.703684 | 3.561033 | .263961 | 14.4925 |
| Size | 200 | 23.83847 | 1.340742 | 19.7494 | 27.6362 |
| TANG | 200 | .4546108 | .2527318 | .000658 | .995672 |
| LR_wi | 200 | 1.25437 | .531928 | .385714 | 2.48258 |

*Source:* Authors' calculation based on STATA Statistics v.13.0

DR has a mean of 56,99% with standard deviation 0,2179. DE has a mean of 270,36%, which shows highly leveraged firms whose debt is in average 2,7 times higher than equity, standard deviation is 3,5610. These leverage values imply that the firms with highest revenues in Serbia seem to rely mainly on debt rather than capital. The descriptive statistics presented here are adjusted to outliers for variables DE, DR and LR using the Winsorize method in STATA. The pre-adjusted values can be found in Appendix 1.

The correlation analysis reveals the trend and the levels of interrelatedness between the two variables. The correlation matrix for the variables is presented in Table 3. Analyzing the correlation matrix, all the statistically significant correlations are of low intensity. In relation to ROA identified is statistically significant, negative, and weak correlation with debt ratio DR where r=-0,01770, Debt to equity ratio DE where r=-0,2261, which is in line with the author assumption about negative influence DE on firm profitability. Statistically significant correlation with firm size (Size) and materiality (TANG), where the coefficients r=-0,1824 and r=-0,1566 respectively, which indicates negative and weak correlation. Also, statistically significant, positive, and weak correlation with liquidity ratio (LR) where coefficient value is r=0,2515.

The indicators of debt ration show the highest number of statistically significant and negative correlations: weak with liquidity ratio (LR), where r=-0,2415 and strong correlation with firm size (Size), where r=-0,5401 and materiality (TANG), where r=-

0,6010 and statistically significant, but positive and strong correlation with debt ratio (DE), where r=0,7768.

Looking at the relationship between the indicators, the result shows that multicollinearity is not a problem in the implementation of analytical techniques.

**Table 3: Correlation matrix – Pearson correlation coefficient**

| | ROA_wi | DR_wi | DE_wi | Size | TANG | LR_wi |
|---|---|---|---|---|---|---|
| ROA_wi | 1.0000 | | | | | |
| DR_wi | -0.1770* | 1.0000 | | | | |
| | 0.0122 | | | | | |
| DE_wi | -0.2261* | 0.7768* | 1.0000 | | | |
| | 0.0013 | 0.0000 | | | | |
| Size | -0.1824* | -0.5401* | -0.3989* | 1.0000 | | |
| | 0.0098 | 0.0000 | 0.0000 | | | |
| TANG | -0.1566* | -0.6010* | -0.5037* | 0.6159* | 1.0000 | |
| | 0.0268 | 0.0000 | 0.0000 | 0.0000 | | |
| LR_wi | 0.2515* | -0.2415* | -0.1440* | 0.0304 | -0.2922* | 1.0000 |
| | 0.0003 | 0.0006 | 0.0419 | 0.6696 | 0.0000 | |

* Statistical significance on the level of 5%

*Source:* Authors' calculation based on STATA Statistics v.13.0

The precondition for the use of regression model is the absence of multicollinearity between the independent variables. Although it is shown in Pearson correlation matrix, to test the multicollinearity, the author chose to construct a correlation matrix and to conduct VIF test in STATA. As there are no correlations between two variables that exceed 10 and 1/VIF is not below 0.2, it can be concluded that there is no multicollinearity in the model.

**Table 4: VIF test of multicollinearity**

| Variable | VIF | 1/VIF |
|---|---|---|
| DR_wi | 3.79 | 0.263519 |
| TANG | 2.87 | 0.348109 |
| DE_wi | 2.55 | 0.391852 |
| Size | 1.80 | 0.557089 |
| LR_wi | 1.60 | 0.624716 |
| Mean VIF | 2.52 | |

*Source*: Authors' calculation based on STATA Statistics v.13.0

Testing the serial correlation is conducted with Durbin-Watson test. As a result, it is close to 2 DW= 1,816128, and it can be concluded that there is no serial correlation in regression.

**Table 5: Durbin-Watson test of serial correlation**

| Model | Durbin-Watson |
|---|---|
| Durbin-Watson d-statistic (6, 200) | 1.816128[a] |
| *a. Predictors: (Constant), DR_wi DE_wi Size LR_wi TANG* | |

*Source:* Authors' calculation based on STATA Statistics v.13.0

For testing heteroskedasticity, Breusch-Pagan test is conducted. The result of p value is higher than 5% (Prob>F=0.0984) and F (5,194) =1,92 is not significant, which allowed the author to accept null hypothesis and conclude that the model was not subject to heteroskedasticity. The model satisfies the panel, but after BP test (0.09%) ,it can be concluded that the regression model is more adequate.

The results of regression coefficients are presented in Table 6. The results show statistical significance and negative impact of debt indicators (ratio total debt and total assets – DR and ratio of capital structure – DE), materiality (TANG) and firm size (Size) on profitability (ROA). The regression coefficient of the last control variable – liquidity (LR) is not statistically significant as p>5%.

The results of the regression analysis outline that:

- The higher ratio of total debt in total assets is negatively related to firm profitability in Serbia. The negative effect is also determined by the authors Adai & Adascou (2015, p. 10) in analysis of SME firms in Romania. Statistical significance and negative relationship of total debt and profitability is consistent with the results from Anderssona & Minnema (2018, p.53) in analysis of the relationship between leverage and profitability of consulting firms in Sweden and with the results of the analyzed firms in Czech by Stryckova (2017, p.107).

- In the study of relationship between capital structure and profitability of IT firms in India, Azhagaiah & Gavory (2011, p.387) also identify statistically significant and a negative relationship of the observed variables. It can be concluded that the results of the analysis of the relationship between managing debt and profitability selected firms in Serbia are mostly consistent with the results of studies in other countries.

- A negative and statistically significant relationship between materiality and profitability identified in this study is consistent with the results of Milos & Milos (2015, p. 231). A negative and statistically significant relationship between size and profitability is identified in this study, and it's consistent with the results of Margaretha & Supartika (2016, p.134) and Močnik & Šimec (2015, p.14). In literature, materiality

and size are mostly driven by positive relationship with profitability. Considering that higher value of tangible assets can decrease investment opportunities and necessary liquidity for firms, and that with increasing firm size growing firms become less profitable, the results in this study show a negative relationship.

**Table 6: Regression analysis**

| Source | SS | df | MS | | |
|---|---|---|---|---|---|
| Model | .184675949 | 5 | .03693519 | Number of obs | = 200 |
| Residual | .691127122 | 194 | .003562511 | F( 5, 194) | = 10.37 |
| | | | | Prob > F | = 0.0000 |
| Total | .875803072 | 199 | .00440102 | R-squared | = 0.2109 |
| | | | | Adj R-squared | = 0.1905 |
| | | | | Root MSE | = .05969 |

| ROA_wi | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| DR_wi | -.0782505 | .0378195 | -2.07 | 0.040 | -.1528406 | -.0036604 |
| DE_wi | -.0044975 | .0018981 | -2.37 | 0.019 | -.008241 | -.000754 |
| LR_wi | .0117356 | .0100637 | 1.17 | 0.245 | -.0081127 | .0315839 |
| TANG | -.0618762 | .0283749 | -2.18 | 0.030 | -.117839 | -.0059133 |
| Size | -.0136159 | .0042281 | -3.22 | 0.002 | -.0219548 | -.005277 |
| _cons | .4549664 | .1026396 | 4.43 | 0.000 | .2525335 | .6573992 |

| Variable | active |
|---|---|
| DR_wi | -.07825049* |
| DE_wi | -.00449748* |
| Size | -.01361592** |
| TANG | -.06187616* |
| LR_wi | .01173561 |
| _cons | .45496638*** |
| N | 200 |

legend: * p<.05; ** p<.01; *** p<.001

*Source:* Authors' calculation based on STATA Statistics v.13.0

'F' test is used to determine the validity of regression model. As p value is below 0,05, it can be concluded that the impact of the independent variables on dependent variable (ROA) is statistically significant. The determined coefficient is 21,09% which implies that 21,09% of the change of the dependent variable is explained by the independent variables.

## 6. Conclusion

Conclusions for optimal relationship of leverage and capital structure are not consistent, however, the majority of studies confirms the pecking-order theory. The main purpose of this study was to investigate if any relationship exists between leverage and profitability of top 50 (with the highest revenues in 2019) non financial firms operating in Serbia. Accordingly, the result of this study was analyzed in relationship to chosen theories on capital structure, namely the irrelevance and the relevance of capital structure (Modigliani & Miller, 1957 and 1963), the trade-off theory (Myers, 1984) and the pecking-order theory (Myers & Majluf, 1984).

The results show that managing debt, measured by the ratio of total debt and total assets and ratio debt to equity has a statistically significant and negative impact on profitability. That implies that the level of leverage in the largest companies in Serbia, as well as the level of ratio debt to equity is raising with lower profitability. A statistically significant relation was found between materiality and profitability and company size and profitability. However, there is no relationship between liquidity and profitability.

Some further research might take into consideration more determinations of profitability, since the value of $R^2$ is small (0.21), which implies that there are more important variables which were not included in this model. Also, the future research can also take into consideration sectorial analysis.

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**Appendix no 1. Minimum and maximum values before and after Winsorized adjustment**

| | All observations | | Extreme values excluded | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| ROA | -.2126406 | 1.111872 | -.0265067 | .2259198 |
| DR | .1092211 | .9920581 | .270225 | .9920581 |
| DE | .1227638 | 124.914 | .2639605 | 14.549251 |
| Size | 19.74939 | 27.63619 | 19.74939 | 27.63619 |
| LR | .022904 | 3.533772 | .385714 | 2.482575 |
| TANG | .000658 | .9956724 | .000658 | .9956724 |

## UTICAJ UPRAVLJANJA DUGOM NA PROFITABILNOST VELIKIH NEFINANSIJKIH PREDUZEĆA U SRBIJI

**Apstrakt:** Odluke preduzeća o stepenu zaduženosti i strukturi kapitala utiču na potencijale za opstanak, rast i razvoj. Cilj rada je analiza odnosa pokazatelja upravljanja dugom na profitabilnost. Istraživanje je spovedeno za period od 2016. do 2019. godine, na uzorku od 50 najvećih nefinansijskih preduzeća iz Srbije, rangiranih prema prihodima od prodaje ostvarenim 2019. godine. Primenom modela regresione analize ispitan je odnos učešća ukupnog duga u ukupnoj imovini i ukupnih obaveza u ukupnom kapitalu na profitabilnost preduzeća, izražen kroz ROA pokazatelj. Kontrolne varijable su veličina preduzeća, likvidnost i materijalnost imovine. Rezultati pokazuju da postoji statistički značajana korelacija i negativan odnos pokazatelja zaduženosti i pokazatelja strukture kapitala u odnosu na profitabilnost posmatranih preduzeća.

**Ključne reči**: ukupne obaveze, struktura kapitala, profitabilnost preduzeća u Srbiji

### Author's biography

**Ivana Milošev** is a PhD student at the University of Novi Sad, Faculty of Economics Subotica, where she finished bachelor and master studies. She attends the module of Business finace, Accounting and Audit. From 2003 to 2016, Ivana was employed in Banking sector, Corporate Divison (ProCredit Bank a.d Beograd, Hypo-Alpe Adria Bank a.d. Beograd, Vojvodjanska Bank a.d. Novi Sad). From 2016 Ivana Milošev is employed in Alltech Serbia (yeast factory), first as financial manager and at present in Alltech SRB as Finance Controller for Eastern Europe (Czech with Slovakian branch, Romania, Bulgaria, Croatia, Poland, Serbia) in Alltech Group. She owns the Investor Adviser Certificate (licence number IS-99-7-7/09) registered in Securities Commission, Republic of Serbia.