

THE DETERMINANTS OF PROFITABILITY IN COMPANIES LISTED ON THE BUCHAREST STOCK EXCHANGE

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ABSTRACT: *This research aims to establish the determinants of financial performance in 126 Romanian companies listed on the Bucharest Stock Exchange, over a period of ten-years (2003-2012). The analysis is based on cross sectional regressions. Return on assets is the performance proxy, while the variables expected to have a significant impact on profitability are debt, asset tangibility, size, liquidity, taxation, risk, inflation and crisis. Regression results indicate that profitable companies operate with limited borrowings. Tangibility, business risk and the level of taxation have a negative impact on return on assets. Although earnings are sustained by significant sales turnover, performance is affected by high levels of liquidity. Periods of unstable economic conditions, reflected by high inflation rates and the current financial crisis, have a strong negative impact on corporate performance.*

KEY WORDS: *profitability, leverage, regression analysis.*

JEL CLASSIFICATIONS: *G3, G32.*

1. INTRODUCTION

Over time, the financial theory and practice focused on finding the capital structure that maximizes the company value. In order to understand the financial decisions, many studies in the corporate finance literature refer to the relationship between capital structure and corporate performance. Therefore, the financial framework, consisting of the mix of equity and debt, ensuring the lowest costs reveals the optimal capital structure. Besides, it is also important to identify factors maximizing the company value through funding resources.

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This paper intends to identify how debt influences return on assets in 126 companies listed on Bucharest Stock Exchange (BSE). Previous research on the same sample returned fixed assets, size, liquidity, business risk, taxation, inflation rate and crisis as determinants of financing decisions in Romanian listed companies. Therefore, these factors will be used along with the capital structure proxy, in order to demonstrate their influence on firm profitability. The companies were selected based on the availability of information needed for this research, information available yearly, for a decade, from 2003 until 2012.

2. LITERATURE REVIEW

The choice between debt and equity suggests somehow a tradeoff between business and financial risk. When companies choose more borrowings to finance their needs, they do not affect corporate ownership. However, ensuring a large proportion of equity based on shareholders' investment offers a better credit rating for the company. Therefore, companies using large borrowings face higher risks while those using more equity tend to operate more conservatively, relying on internal funds.

The influence of capital structure on performance is not clearly stated in the literature. There are studies demonstrating that companies have higher returns when they operate with a larger amount of borrowed funds, but a negative influence on results coming from the long-term debt (Abor, 2005). The development of financial markets and economies is very important as long as results are different, depending on the countries analysed. Several studies discovered that leverage in Chinese firms has a negative influence on return on assets (Huang & Song, 2006; Chakraborty, 2010). There are also studies that could not find any relationship between financing decisions and performance (Ebaid, 2009).

As long as many capital structure determinants influence profitability, studies analyzing the relationship between financing decisions and performance usually employ some of these determinants. Akintoye (2008) realized an analysis of corporate performance in selected companies operating in the Nigerian food and beverage industry. He used four indicators as performance measures related to earnings and dividends. Besides the role of capital structure, the author mentioned taxation, business risk, financial flexibility and managerial behaviour as important factors of performance. Other studies revealed that Romanian companies are managed rather intuitively, as managers take decisions subjectively focusing on short-term and forgetting about competitiveness and long-term performance (Moldovan, et al., 2013).

Considering the economic conditions, results indicated that companies borrow more in order to avoid the tax burden, and so they improve their performance. Previous studies on Romanian manufacturing companies listed on BSE demonstrated that they follow the main rule of financing, which refers to matching the asset life with the maturity of resources used for funding that asset. Moreover, during times of high inflation rates, companies tend to access more short-term debt when they need financial resources (Vătavu, 2013). The matter refers to whether or not these characteristics are available for all Romanian listed companies. Although the business activity should require a target of capital structure, as sectors may be characterized by

various debt ratios, the latest trend reveals small differences in the indebtedness degree of sectors, if compared to the overall indebtedness of Romanian companies (Pirtea, et al., 2010).

3. DATA AND METHODOLOGY

3.1. Sample

The sample consists of 126 companies listed on the BSE. Based on their summarized balance sheet, indicators were computed over the 2003 - 2012 period. To ensure results robustness only certain categories of companies were selected for this sample:

- in order to reduce the number of outliers, delisted companies, those in dissolution stage or those registering negative equity values were not included in the sample;
- in order to ensure data reliability, only companies with financial data available for every year, from 2003 until 2012, were selected.

3.2. Data

The capital structure will be expressed by total debt ratio. This indicator was widely used because the long-term goal is usually purely financial. Besides, Romanian companies use an insignificant amount of long-term debt, and thus there is no need for considering two debt ratios, depending on its maturity. Other financial and non-financial indicators will be included in the analysis: tangibility, size, liquidity, risk, tax and a macroeconomic factor comprising inflation and crisis. Data was obtained through the formulae presented in the following eight equations.

$$ROA = \frac{\text{Earnings before interest and tax}}{\text{Total Assets}} \quad (1)$$

$$\text{Debt} = \frac{\text{Total debt}}{\text{Total Assets}} \quad (2)$$

$$\text{tang} = \frac{\text{Fixed Assets}}{\text{Total Assets}} \quad (3)$$

$$\text{size} = \log(\text{Sales Turnover}) \quad (4)$$

$$\text{liquid} = \frac{\text{Current Assets}}{\text{Short-term debt}} \quad (5)$$

$$\text{risk} = \text{stddev} \left(\frac{\text{Earnings before interest and tax}}{\text{Total Assets}} \right) \quad (6)$$

$$\text{tax} = \frac{\text{taxes}}{\text{Earnings before interest and tax}} \quad (7)$$

$$\text{inflat} = \text{inflation rate} \times \text{crisis} \quad (8)$$

3.3. Methodology

This paper is analyzing the relationship between debt, a series of debt determinants, and performance on a time-series cross-sectional data over the 2003 – 2012 period. The performance indicators will be regressed on the rest of variables, considering that performance is a function of these financial and non-financial indicators, presented in equation (9):

$$\text{Performance} = f(\text{debt, tangibility, size, liquidity, risk, taxation, inflation, crisis}) \quad (9)$$

Based on the previous function, equations (9) and (10) express the linear models of performance. α_i ($i = 1 \dots 126$) represents the unknown intercept of every company, t ($t = 2003 \dots 2012$) is the year analysed, β_s are the coefficients for every independent variable and ε_{it} is the error term.

$$\begin{aligned} \text{ROA}_{it} = & \alpha_i + \beta_1 \text{Debt}_{it} + \beta_2 \text{tang}_{it} + \beta_3 \text{size}_{it} + \beta_4 \text{liquid}_{it} + \beta_5 \text{risk}_{it} + \\ & + \beta_6 \text{tax}_{it} + \beta_7 \text{inflcr}_{it} + \varepsilon_{it} \end{aligned} \quad (10)$$

Several regression models will be used in order to test the results robustness and the data reliability. The first stage of analysis is the Pooled Ordinary Least Squares (OLS). The second stage is to compute Fixed Effects with n entity-specific intercepts (FE) and Random Effects (RE) models. The Hausman Test will be used to discover which model is more suitable for the sample data. Fixed effects models consider that the characteristics of companies influence the correlations between the variables, while random effects models assume a random variation across companies which are not correlated to independent variables. For this sample, we expect that the Hausman test coefficient will reject the null hypothesis, which states that the difference in coefficients is not systematic. Rejecting the hypothesis would mean that the fixed effect model is more appropriate for the sample. If Hausman indicates that Random Effect is more suitable, an additional test, the Breusch-Pagan Lagrange multiplier will help us decide between a random effects or an ordinary least squares model. As long as capital structure and corporate performance accounts for differences across firms it is expected to use firm fixed effects. Based on the Hausman test, coefficient and p-value, another stage of analysis is to consider a corrected model, which will also take into consideration heteroskedasticity and autocorrelation, through Wald test and Wooldridge test. The Modified Wald test for groupwise heteroskedasticity in regression models with fixed effects indicates the presence of heteroskedasticity if the test rejects the null hypothesis, which considers a constant variance and data homoskedasticity. The Wooldridge test for serial correlation in panel data returns better results for long time series, but it is efficient in micro panels as well. The null hypothesis expresses no serial correlation (Torres-Reyna, 2007). Stata offers the options to correct the heteroskedasticity and autocorrelation issues. Despite of correcting the model, static regressions cannot overcome heterogeneity, and thus a Generalized Method of Moments (GMM) will be used as a final step of analysis. The most important relationships between capital structure, its determinants and performance will be discussed based on the regression results and their consistency.

3.4. Descriptive statistics

Table 1 comprises the main descriptive statistics for the variables used in the analysis. Based on the performance indicator, companies register limited earnings, of approximately 4% of total assets. The capital structure ratio indicates a preference for equity, as borrowed funds represent only a third of the capital in Romanian companies.

The average tangibility shows a greater usage of tangible assets - almost 60% of total assets - with a relatively high standard deviation, indicating that companies own fixed assets based on their activity. Compared to the minimum of 3.8, average companies are rather large (the mean of size is 7.31). The liquidity ratio indicates a level of current assets which exceeds the short-term debt three times. This is an optimum value considered in theory, although it should take into account the industry. The average risk does not necessarily imply that Romanian companies face unstable earnings, but its standard deviation is high. The tax ratio shows an average of 23.6% and the variable composed of crisis and inflation rate fluctuates up to 8%, with an average of 3%.

Table 1. Descriptive statistics

| Variable | Obs | Mean | Std.dev. | Min | Max |
|----------|------|-------|----------|--------|--------|
| ROA | 1260 | 0.039 | 0.116 | -1.108 | 0.656 |
| Debt | 1260 | 0.342 | 0.257 | 0.005 | 1.811 |
| tang | 1260 | 0.587 | 0.214 | 0.018 | 0.997 |
| size | 1260 | 7.306 | 0.813 | 3.809 | 10.290 |
| liquid | 1260 | 2.968 | 3.688 | 0.011 | 29.364 |
| risk | 1134 | 0.147 | 0.591 | 0 | 10.539 |
| tax | 1260 | 0.236 | 0.137 | 0 | 1 |
| inflcr | 1260 | 0.029 | 0.030 | 0 | 0.079 |

4. RESULTS

Unit-root tests were applied on every variable included in the panel data in order to examine if data is stationary and control for spurious relationships among variables. The null hypothesis is that all panels contain unit-root. This was rejected in all cases, providing the basic conditions to perform a regression analysis on this data. This section includes correlations between variables considered in the analysis (Table 2) and regression analysis results (Table 3).

It seems that companies are less profitable when they operate with higher borrowings, as the return on assets is affected by debt. Other values that constrain the profitability of Romanian companies are tangibility, risks, and external conditions, inflation and crisis. Companies are more profitable when their sales and liquidities increase, and also when the taxes are high, also indicating higher earnings.

Table 2. Correlations

| | ROA | Debt | tang | size | liquid | risk | tax | inflcr |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| ROA | 1 | | | | | | | |
| Debt | -0.264 | 1 | | | | | | |
| tang | -0.157 | -0.346 | 1 | | | | | |
| size | 0.167 | 0.122 | -0.097 | 1 | | | | |
| liquid | 0.161 | -0.478 | -0.098 | -0.177 | 1 | | | |
| risk | -0.039 | -0.048 | 0.046 | -0.141 | 0.196 | 1 | | |
| tax | 0.015 | -0.031 | -0.051 | 0.003 | 0.045 | -0.010 | 1 | |
| inflcr | -0.185 | -0.104 | 0.083 | -0.006 | 0.118 | 0.075 | -0.008 | 1 |

Table 3. Determinants of return on assets in Romanian companies listed on BSE

| | OLS | FE | RE | FE corrected | FE corrected (time FE) | GMM |
|--------------|----------------------|----------------------|----------------------|----------------------|------------------------|----------------------|
| lag 1 | | | | | | 0.197*** (0.028) |
| lag 2 | | | | | | 0.055*** (0.018) |
| lag 3 | | | | | | 0.076*** (0.017) |
| DT | -0.172*** (0.014) | -0.236*** (0.020) | -0.206*** (0.017) | -0.236*** (0.043) | -0.245*** (0.043) | -0.195*** (0.052) |
| tang | -0.134*** (0.015) | -0.246** (0.024) | -0.184*** (0.019) | -0.246*** (0.043) | -0.234*** (0.043) | -0.281*** (0.035) |
| size | 0.024*** (0.003) | 0.058*** (0.010) | 0.028*** (0.005) | 0.058*** (0.012) | 0.059*** (0.013) | 0.040*** (0.005) |
| lichid | 0.0001 (0.001) | -0.004*** (0.001) | -0.002** (0.001) | -0.004** (0.001) | -0.003* (0.001) | -0.002 (0.001) |
| risc | -0.001 (0.005) | -0.006 (0.004) | -0.006 (0.004) | -0.006 (0.004) | -0.001 (0.005) | -0.002 (0.002) |
| fisc | -0.001 (0.002) | -0.001 (0.002) | -0.001 (0.002) | -0.001 (0.001) | -0.0002 (0.000) | 0.003*** (0.000) |
| inflcr | -0.736*** (0.097) | -0.644*** (0.086) | -0.692*** (0.086) | -0.644*** (0.099) | | -0.172** (0.075) |
| 2005 | | | | | -0,02*(0,01) | |
| 2006 | | | | | -0,01(0,01) | |
| 2007 | | | | | -0,04***(0,01) | |
| 2008 | | | | | -0,05***(0,01) | |
| 2009 | | | | | -0,07***(0,01) | |
| 2010 | | | | | -0,06***(0,01) | |
| 2011 | | | | | -0,07***(0,01) | |
| 2012 | | | | | -0,08***(0,01) | |
| cons | 0.020 (0.031) | -0.129 (0.083) | 0.039*** (0.044) | -0.129 (0.098) | -0.121 (0.098) | |
| F-test | 42.74*** | 40.22*** | 286.74*** | 15.06*** | 11.27*** | |
| Wald chi2(7) | | | | | | 346.91*** |
| R-squared | 0.2110 | 0.1871 | 0.2364 | 0.1871 | 0.2130 | |
| Hausman | | | 62.64*** | | | |

| | | | | | | |
|---|--|-------------|--|--|--|----------------------------|
| time FE | | 12.10*** | | | | |
| Wald | | 67065.29*** | | | | |
| Wooldridge | | 5.92** | | | | |
| Sargan (Prob>chi2) | | | | | | 31.18 (0.4547) |
| Arellano-Bond test order 1(Prob>z) order 2(Prob>z) | | | | | | -4.03(0.00) -0.43(0.66) |

Based on the results of the static regression models and their statistically significant coefficients presented in table 3, debt, tangibility, size, liquidity and the variable of inflation and crisis are the determinants of return on assets.

The level of debt inhibits return on assets, and the relationship is statistically significant at 1% level. On one side, an increase of 1% in debt ratio would induce a decrease of up to 0.25% in asset returns. When they are performant, companies register more earnings in order to meet their needs. Hence, as long as borrowed funds are kept to a minimum proportion of capital and profits are large, companies should have a strong operational capacity. Moreover, the higher the efficiency of managing assets, the more performing the company will be.

A higher proportion of fixed assets induces a decrease in asset returns. More precisely, the indirect relationship shows that 1% increase in the proportion of fixed assets in total assets produces a decrease of up to 0.27% in return on assets. Tangibility coefficients are statistically significant at 1% level in all regression models. There are multiple reasons why Romanian companies with higher fixed assets register lower returns. First of all, over a long period of time, an investment in tangible assets would have a direct impact on performance if it would be financed mostly through internal funding. Furthermore, if companies lack of equity or liquidities, higher fixed assets could be dependent on higher operating leverage. Second, this relationship could provide evidence that the sampled companies are not able to operate efficiently with their tangible assets, affecting their performance. In addition, if an investment has a higher value, it would reach its break-even point on a longer period of time.

Size is another statistically significant factor in every model used. In Romania, the bigger the companies are the higher their return on assets will be. Greater size implies that firms register higher sales turnover and therefore they have a good place on the market and even development prospects. Regardless its proxy, performance is in general linked to strong solvency, meaning that large companies operate more efficiently when they benefit from economies of scale. Accordingly, larger firms may also leverage their market power, thus having a positive effect on profitability (Onaolapo & Kajola, 2010). This assumption is supported by the correlation between debt and size, meaning that companies listed on BSE operate with greater debt ratios when they register higher sales turnover.

Liquidity has an indirect relationship with performance, and it is statistically significant in all static models, except OLS. As long as a higher level of liquidity provides a lower return on assets, we can assume that Romanian companies do not invest their internal funds in excess over short term. Another reason would be related to their current assets organization: either companies dispose of cash flows because

their operational activity is limited, or they keep large stocks due to defective inventory, operational capacity or lower market demand for their products.

According to the coefficients of risk and tax, these variables have a negative impact on profitability. This shows that companies assuming higher business risk are less performant in terms of their assets. Also, static models indicate that higher taxes affect performance of Romanian companies. ROA is calculated based on earnings before interest and tax, and thus, considering that tangible assets are lower when taxes are high (according to the correlations presented in Table 2) we can state that an increase in the level of taxation affects the company earnings. However, business risk and tax variables should not be considered determinants of ROA, as they are not statistically significant.

Inflation and crisis have an indirect relationship with return on assets. Although recently inflation rates were low, higher values constrain corporate activity. In addition, since the crisis started, sales were affected. Regression results indicate a statistically significant relationship: an increase of inflation and crisis variable with a unit causes a decrease of return on assets with approximately 0.7 units. From all variables, this has the highest impact on the performance proxy.

The Hausman test rejects the null hypothesis, indicating that differences across companies influence the relationships between variables. Therefore, the fixed effect model is preferred as it controls for firms' characteristics, such as industry sector, the level of competition, the region where the company is established. Additional tests confirm the need for time fixed effects, as the model should take into consideration omitted time-invariant characteristics. In both regressions most of the years included in the decade have statistically significant coefficients. Previous research demonstrated the use of fixed effects in controlling for unobservable and time-invariant characteristics of companies (MacKay & Phillips, 2005; Lemmon, et al., 2008). The corrected Fixed-Effect model also takes into account for heteroskedasticity and autocorrelation, as both coefficients of Wald and Wooldridge tests indicate that data does not comply with all regression assumptions.

The dynamic model confirms the role of capital structure ratio, tangibility, size, taxation, inflation and crisis. The relationships are consistent with the static analysis results. In addition, ROA is dependent on its previous ratios, indicating a direct relationship.

All regression models have an F-test statistically significant at 1% value, confirming the relevance of the model in determining return on assets for companies listed on BSE. However, it could be improved by adding variables with potential impact on profitability as the R-Squared of all models indicates that 23% of the variance in ROA, or less, can be explained by the variance of the variables employed.

5. CONCLUSIONS

The capital structure has an important influence on performance in Romanian companies. This research study confirms the conclusions of most studies focused on developing countries. Romanian companies register higher performance when they use limited borrowings. Moreover, results show that investments are not based on debt.

Therefore, there is a tendency for pecking order theory, as Romanian companies require external financing in order to continue their activities only when their internal funds are limited or when they lack liquidity. There can also be a preference for borrowed funds because accessing equity is uncommon for companies due to Romania's underdeveloped financial market.

Although the pecking order theory confers more financial stability, a couple of aspects should be corrected in order to adjust the corporate performance in Romania. First of all, there is a deficiency in investing over short term, because companies do not use their internal funds profitably. Results also prove that large companies operate their assets more efficiently, although their sales are based on borrowed funds. This increases business risks, despite the fact that this might be already too large, threatening the company activities over long-term.

A large proportion of fixed assets affects the return on assets. This does not necessarily represent a problem because investments in fixed assets return are profitable after a longer period of time. During times of high inflation and unstable conditions caused by the financial crisis, companies tend to reduce their debt ratio, preferring equity. As a consequence, tangible assets seem to have a higher proportion in total assets during times of financial constraints. After 2007, when the crisis triggered, the Romanian companies indicate a decrease in return on assets. But despite of the unstable economy, results prove that companies undertake new investments trying to develop and maintain their market position.

Romanian companies depend on creditors due to the absence of a liquid financial market. However, tax savings do not boost the use of debt. With the cost of interest and a high level of taxation, even companies with large operating profits seem to be poor financial performers in terms of their net income.

For future research it is advised to consider sub-sampling, based on the industrial sector, as long as the regression analysis proved that differences across companies influence the relationships between variables. Also, testing the model on sub-periods, before and during the crisis, may return different results indicating a break since the crisis started. However, this research indicated robust results with statistical significance, and thus the conclusions are relevant.

6. ACKNOWLEDGEMENT

This work was supported from the European Social Fund through Sectorial Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/134197, project title "Performance and Excellence in Doctoral and Postdoctoral Research in Romanian Economics Science Domain".

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