On Financial Performance and Capital Structure of Romanian Companies

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Abstract: *The purpose of this paper is to validate the theoretical background of the specialized economic literature on financial performance of companies as a function of different capital structure determinants on the Romanian market. As such, the capital structure considered indicators are the short term, long term and total debt ratios, further adding the logarithm of Sales as a proxy for the size of a company. For performance, the paper used the companies' return on assets and net profit margin, significant results being obtained for the former only. Data were processed with the help of the IBM SPSS 20 software, using the linear regression technique. Basically, the sample points towards a negative weak correlation between total debt and return on assets.*

Keywords: profitability, performance, rate of return, capital structure, linear regression modeling

JEL Classification: G32

1. Introduction

Capital structure decisions reflect the way a company finances its assets through some combination of equity and debt. The target capital structure of an enterprise is the best debt to equity ratio, the one that maximizes the efficiency of that company's activity, providing it with high profitability at minimum costs and associated risks. Various classical and modern capital structure theories such as Modigliani-Miller's theorem, the trade-off theory, pecking order theory, agency theory and market timing theory argued for different choices related to financing decisions of companies.

The paper includes an analysis of the scientific literature on evaluating the impact of capital structure on performance efficiency of companies, by pointing out just some of the papers that have been concerned with similar statistical analysis methods and variables like the ones used by this study, thus proving a solid base. Then the paper describes the methodology applied on a sample of the most recent available cross sectional data for the Romanian companies listed at the Bucharest Stock Exchange, in order to snapshot on the impact of capital structure ratios on companies' returns. The last part interprets the obtained results and draws the conclusions of this paper.

2. Literature Review

Many worldwide specialists have been interested in studying the correlations between the capital structure of enterprises and their financial performance, a large number of studies being carried out on emerging markets.

Adewale, M., & Ajibola, O. (2013) examined the impact of capital structure on performance of some selected manufacturing companies in Nigeria. Their regression

results confirm that debt ratio, asset turnover and size of the firm are positively related to firm performance, while evidence of a negative and significant relationship was found between asset tangibility and measures of firm performance. Their results also show that growth fails to have a significant effect on either of the performance indicators.

There exist a multitude of capital structure indicators that influence the firm performance and profitability. Previous papers investigated the relationship between capital structure and profitability of listed firms on the Ghana Stock Exchange, through regression analysis for the estimation of functions relating the return on equity with measures of capital. With regard to the relationship between total debt and return rates, the results showed a significantly positive association between the ratio of total debt to total assets and return on equity (Abor, 2005).

A particular interesting paper is that of Norvaisiene, R. (2012), which studies the impact of capital structure on the performance efficiency of Baltic listed companies. This research included data of only non-financial companies from all of the three Baltic states, because the capital structure of financial institutions is specific and the performance efficiency of such companies would be affected in a completely different way. The paper examines the interaction of capital structure with the companies' performance efficiency through a correlation analysis between the indicators of indebtedness level (long-term financial debt ratio, short-term financial debt ratio, financial debt ratio, non-financial debt ratio) and some performance indicators (operating profit margin, net profit margin, return on equity, return on assets, liquidity ratio, capital asset turnover and total asset turnover). The p-values were used here in order to verify the reliability of the observed correlation. In order to estimate the strength of the influence of indebtedness on performance efficiency of the companies, the multivariate regression analysis was performed. The dependent variables were the indicators describing performance efficiency of the companies while the independent variables were the financial and non-financial debt ratios. The research further evidenced an indirect relationship between financial indebtness and profitability ratios.

Patel, N.M., & Bhatt, V. (2013) also argued that capital structure decisions affect the liquidity and profitability of a company. Working on a sample of 30 non financial companies listed on their National Stock Exchange, they carried out regression analysis of net operating profitability as a dependent variable as a function of several independent variables, such as total debt ratio, long term debt ratio, equity to liability ratio and size of the firm, measured as a natural logarithm of sales. Their model was estimated using the pooled least squares method, and the adjusted R square for this multiple regression was of only .286. Furthermore, the relationship between profitability and total debt ratio is an indirect one. An increase in the leverage of their companies would adversely effect the companies' profitability.

A reference paper in the Romanian literature is that of Vătavu S.(2013).The author determined the relationship between capital structure and firm efficiency for Romanian light industry companies listed on the Bucharest Stock Exchange, using panel data. The tested model expresses profitability as a function of debt, equity, tangibility, tax, business risk, liquidity, inflation. As such, the ROA and ROE financial performance indicators were regressed on a group of explanatory variables including internal factors such as capital structure ratios, asset tangibility and liquidity, and external determining factors such as taxation and inflation.

Summing up the ideas revealed by these studies, one can realise that strong efforts and toil have been dedicated for analysing the relationship between capital structure and firm performance by the finance literature of the last years.

3. Methodology and Data

The connections between economic phenomena are characterized by the fact that one phenomenon or another varies under the influence of a complex range of factors, some of which having a crucial influence and others being of a secondary importance. As such, some exogenous variables greatly influence the endogenous variable, and therefore they should be taken into account in the calculation of regression and correlation parameters, while others exert a less important action and may be neglected.

Simple linear regression models may be estimated through the least squares method with the help of different software packages, the general shape of such a model being the following:

$$y_t = ax_t + b + \varepsilon_t,$$

where y_t = the endogenous/dependent variable $\underline{\text{not}}$ ROA;

x_t = the exogenous/independent variable $\underline{\text{not}}$ TotD;

εt = residual/prediction error = the difference between the actual and predicted values of the dependent variable y_t;

t = the number of cross-sectional units under analysis.

If the independent value x_t represents a measure that can never have a true value of 0, the intercept b aids in improving the prediction process but has no explanatory value. The interpretation is that for each additional unit of x_t (i.e. x_t increases with one unit), y_t is higher on average by a. Moreover, the predictive accuracy of the model is given by its coefficient of determination (R^2). According to Hair et all (2010) R square represents the amount of variance in the dependent variable y_t explained by the independent variable(s) x_t and it ranges from 1 (perfect prediction) to 0 (no prediction).

The research problem considered by this paper focuses on the objective of *explanation* of multiple regressions. As such, the selection of dependent and independent variables was carried out considering strong theoretical grounds. Sample size impacts upon the statistical power of regression and it also affects the generalizability of results by the ratio of observations to independent variables. Recommendations of Hair et all (2010) state 15-20 observations for each independent variable, which is respected, as this paper considers simple regressions only.

The basic assumptions of regression analysis are the linearity of the phenomenon, the constant variance of the error term (homoscedasticity), the independence of the error terms and the normality of the error term distribution. Testing assumptions must be done not only for each dependent variable and independent variables, but for the variate as well (e.g.Fig.1).

In order to model the return on assets (ROA, computed as Earnings Before Interest and Taxes divided by Total Assets) of the Romania companies included in our sample, we have firstly considered the most often used indicator in descriptive and empirical studies, namely their total debt ratio (TotD). Taking as a starting point the previous literature on the modelling of the relationship between companies' returns and their capital structure through cross-sectional, time-series and panel data, this paper tried to verify the hypothesis of whether there exists a dependency (correlation) between the debt ratio and the return on assets, anticipating a relatively strong correlation. Previous studies have obtained either a direct or an indirect relationship, valid economic arguments existing for both situations.

From the Bucharest Stock Exchange public data, we have extracted a sample of N=50 non-financial companies, considering their most recent financial indicators, i.e. the data for the 2012 year, published in 2013. The models were estimated using the linear regression technique, having ROA and Net Profit Margin as dependent variables, while the independent variables were considered on turns: Total Debt ratio, Long Term Debt ratio, Short Term Debt ratio and the logarithm of sales as a proxy for the Size of that company.

4. Results and Interpretations

The descriptive statistics for the range of variation of variables, their mean and standard deviation are presented in Table number 1:

Table 1. Descriptive statistics of the dependent and independent variables

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	50	-.2032	.2202	.008067	.0780284
NetPrMg	50	-5.0312	1.4864	-.026135	.8362086
TotD	50	.0103	1.7367	.339703	.3557083
LongTD	50	.0000	1.0849	.130232	.2198207
ShTD	50	.0053	1.0957	.209471	.2746185
Size	50	4.9690	8.6145	7.026330	.8245309
Valid N (listwise)	50				

Source: Authors' processing

The coefficients estimated through linear regression of ROA as a function of Total Debt, Long Term Debt, Short Term Debt ratios and Size, on turns (i.e. Models (1) to (4)), are presented in Table no 2. The significance of the overall model is given by the coefficient of determination R^2. Still, it's recommended to use the adjusted R^2 as it not only reflects overfitting, but also the addition of variables that do not contribute significantly to predictive accuracy, according to Hair et all (2010).

Table 2. The estimation of ROA

ROA independent variable	Linear simple unstandardized coefficients' estimation			
	(1)	(2)	(3)	(4)
Constant term	0.043 (0.003)	0.023 (0.003)	0.028 (0.038)	-0.033 (0.737)
TotD	-0.102 (0.001)	-	-	-
LongTD	-	-0.116 (0.020)	-	-
ShTD	-	-	-0,096 (0.016)	-
Size	-	-	-	0,006 (0,673)
No. of observations	50	50	-	-
Adj R^2	0.198	0.088	0.096	0.004

Source: Authors' processing

Note: Within parentheses there are the p-values. Estimations were carried out using the linear regression technique implemented in the IBM SPSS 20 software.

The Adjusted R^2 points towards Model (1) as the only relevant model, by indicating a medium to weak magnitude of correlation. Furthermore, Pearson correlation coefficients between ROA and Total Debt Ratio are presented in Table no 3. The correlation is of -0.463, which reveals that the two variables are negatively correlated with each other, i.e. if one variable increases, the other decreases.

Table 3. Pearson correlation coefficients

Correlations

		ROA	TotD
Pearson Correlation	ROA	1.000	-.463
	TotD	-.463	1.000
Sig. (1-tailed)	ROA	.	.000
	TotD	.000	.
N	ROA	50	50
	TotD	50	50

Source: Authors' processing

Table no 4 details the estimations of linear regression for Model (1) while Table no 5 presents the unstandardized and standardized coefficients of this model. According to Hair et all (2010), the sign of the coefficients denotes whether the relationship is positive or negative, and the value of the coefficient indicates the change in the dependent value each time the independent variable changes by 1 unit. At an increase of one unit in TotD, the ROA would decrease by an average of 0.102

units. So, for this sample of Romanian companies, the higher their 2012 total debt ratio, the lower their return on assets, thus profitability and performance.

Table 4. Ordinary Least Squares estimation for Model (1)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.463[a]	.215	.198	.0698701

a. Predictors: (Constant), TotD

Table 5. Coefficients and their significance for Model (1)

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	.043	.014		3.102	.003	.015	.070
TotD	-.102	.028	-.463	-3.621	.001	-.158	-.045

a. Dependent Variable: ROA

Source: Authors' processing

The scale of the independent variables also comes into play, and in order to be ensured that all of the independent variables are on comparable scales, the standardized (Beta) coefficients are used (Table no.5, i.e. -0.463 for TotD) as they reflect the relative impact of the dependent variable ROA on a change in one standard deviation in TotD. Still, beta coefficients are used only as a guide to the relative importance of the independent variables included in the equation.

Figure no 1 represents the histogram of ROA and the normal probability plot of residual, which closely follows a straight line, so it does not violate the assumptions mentioned before.

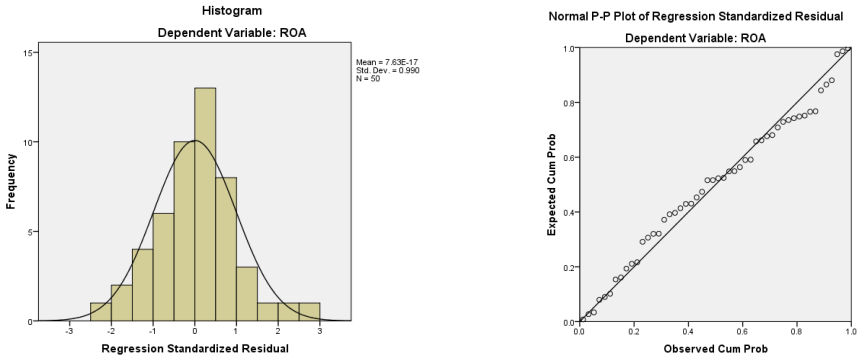

Fig. 1. Histogram of ROA and normality of error
Source: Authors' processing in IBM SPSS 20

The same estimations were carried out having the Net Profit Margin as a dependent variable and the four dependent variables considered before, on turns. Basically, Models (1) to (4) were re-estimated with Net Profit Margin as an endogenous variable. Unfortunately, no significant results were obtained for the considered sample.

5. Conclusions

Validation of results refers to their generalizability and transferability. Although the specialized literature contains multiple previously validated results on the same topic, empirical approaches to model validation consist in testing additional or split samples. Based on the availability of data from the Bucharest Stock Exchange, an additional cross sectional sample might be tested.

Moreover, these models may be estimated by using other independent variables that account for the financial performance of companies, except for ROA and Net Profit Margin, such as Operating Profit Margin, or Return on Equity (ROE). Then, several other exogenous variables might be considered, either acting as internal factors specific to the analyzed companies, or external macro economical factors, such as fiscal regimes, inflation, and others. An interesting approach is that of using dummy variables for stressing a particular industry, which represents the target of a future study.

Summing up, performance proved to be higher when companies avoided debt and operated based on equity. Indeed, capital structure decisions influence financial performance, and capital structure determinants might also affect companies' returns.

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