Determinant factors of the capital structure of a firm- an empirical analysis

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Abstract

This paperwork investigates the relative importance of five factors upon the capital structure decisions of Romanian firms listed at the Bucharest Stock Exchange and operating in the construction sector of the industry. The analysis is based on panel data estimations on a sample of 20 companies, observed during three years (2009-2011). Traditional explanatory variables are adopted in the study, including profitability, company size, tangibility of assets, liquidity and asset turnover. By employing the ordinary least squares method and the fixed effects model, simple and multiple linear regressions are obtained. These are further selected and interpreted in order to determine the influence of the independent variables upon the leverage of a company. The results show that profitability and liquidity ratios are negatively affecting the total debt ratio of Romanian companies. The tangibility of assets is also having a negative impact on leverage, strengthening the findings of previous empirical studies which claim that this indicator moves in opposite direction with the debt ratio of companies located in developing countries. On the other hand, the size of a company and its asset turnover have a positive correlation with leverage. The explanatory variable which has the highest impact on the capital structure choices is profitability.

Keywords: leverage; capital structure; profitability.

1. Introduction

The access to financing and its cost represent important dimensions of the competition between firms and the decisions regarding the optimal capital structure choice are essential in maximizing the enterprise value and hence, in stimulating the growth of the existing shareholders’ benefits.

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Being strongly connected with the long-term financing methods used by a company, the capital structure of a company reflects the debt to equity ratio in the financing choice. We distinguish between capital and financial structure, which besides long-term debt, includes short-term debt as well (Nistor, 2004).

In the specialized literature, the factors that affect the capital structure of a firm are classified into two categories: (a) the external factors reflecting country-specific macroeconomic conditions (for instance, the inflation rate and the average interest rate) and (b) the internal factors specific to the business, such as the profitability, the company’s size, the tangibility of its assets, the liquidity, the asset turnover, etc. Considering the fact that the external factors are general and common for all the companies in the same country, this paperwork will consider the internal factors’ impact on the financing decisions of Romanian companies operating in the construction sector.

Being one of the engines of the Romanian economy during several years, the construction sector has achieved a turnover of 14.3 billion euros in 2008, followed by a gradual annual decline to 9.3 billion in 2011. Expectations for 2012 indicate that the pre-crisis level will be exceeded especially in the infrastructure construction, followed by a trend of stable growth based in part on funding allocated through EU structural funds and driven by the need for development and modernization of infrastructure construction (Europe in figures, 2011).

The purpose of this study is to synthesize the classical and modern theories of capital structure, to identify the factors specific to a firm that have a significant impact on its financing decision and to construct econometric models starting from a set of observations. Thus, the second section is devoted to a theoretical discussion on the capital structure, the third section presents the methodology used, more specifically, the way of defining-measuring the explanatory variables, the selection-collection of data and the econometric models applied. The fourth section summarizes the research results and their interpretation, and the final section is devoted to drawing conclusions.

2. Different theories of capital structure

2.1. Modigliani-Miller’s theorem (1958)

Modigliani and Miller were the first to set up a theory of optimal capital structure. Within this theory, they developed two propositions: (1) the first claims that the level of leverage of a company does not affect its market value, which is constant regardless of the proportions of debt and equity chosen in financing the company, (2) the second proposition describes the weighted average cost of an enterprise as being unaffected by the company’s leverage. Even though it does not take into consideration the bankruptcy costs, the taxes and the other costs of agent and on the other hand it does not distinguish between natural and legal persons when referring to the lending process, Modigliani and Miller's theorem is considered the most important reference from the whole theory of capital structure (Modigliani and Miller, 1958).

2.2. Trade-off theory

The trade-off theory, arising as a result of discussions on the Modigliani-Miller theorem, claims that a firm will borrow up to the point where the marginal value of the tax reduction or tax shield on the interest paid for the contracted loans will be balanced by an increase in the present value of the bankruptcy costs (Myers, 2001).

The development of a classical version of the trade-off theory was done by Kraus and Litzenberger (1973) who showed that the market value of a leveraged company is equal to the market value of a company which does not rely on leverage at all, plus the present value of the tax reduction on the interest paid on debts, less the present value of the bankruptcy costs; according to it, the optimal level of debt of a company reflects an equilibrium between the bankruptcy costs and the tax benefits of debt.
The essence of this theory is that it allows setting a target rate of borrowing, which varies according to the business characteristics; in general, companies with great opportunities for expansion, but also the least profitable firms, with a high percentage of current assets will have a low level of debt while large companies with stable cash-flows and a high proportion of non-current tangible assets will be highly leveraged (Myers, 2003).

2.3. Pecking order theory

Elaborated by Myers (1984) and Myers and Majluf (1984), the pecking order theory argues that due to the information asymmetry that exists between managers, shareholders and investors, companies prefer to finance their investment first, by internal resources, then by borrowed capital, and finally by using the equity provided by shareholders (Myers and Majluf, 1984).

According to this asymmetry, existing investors will not favour the issuance of new shares for other potential investors, because the latter, ignoring the intrinsic value of the assets and of the business’ opportunities, may require higher returns to offset the risk of their investment, thereby reducing the income of the current shareholders.

2.4. Agency theory

Unlike the theories presented above, the agency theory assumes that the interests of the managers and the shareholders are not perfectly aligned and that managers, although acting as agents of the shareholders, will not always act according to the investor’s best interests, but they will pursue their personal benefits (Jensen and Meckling, 1976).

Jensen and Meckling (1976) introduced the concept of agency costs, which in their view include the expenses incurred by principals in monitoring their managers, the expenses related to the obligations of the agents and other residual losses. Furthermore, they highlighted two types of conflicts of interest that generate agency costs: conflicts between shareholders and managers and conflicts between shareholders and creditors which arise when the company’s level of debt increases and shareholders may obtain benefits on behalf of the creditors in case of default.

2.5. Market timing theory

Although it does not define an optimal capital structure, the market timing theory shows that some specific conditions of the capital market and the macroeconomic conditions within a country may affect the structure of the capital of the companies listed on an exchange.

Trying to be in synchronization with the market implies that companies would issue shares at a high price and then try to redeem or buyback these stocks at a lower price. The beneficiaries of this practice are the existing shareholders and the managers who pursue the interests of the investors, are expected to synchronize with the market (Bakar and Wurgler, 2002).

In studying the financing alternatives adopted by enterprises, the theories on capital structure represent a fundamental basis for analysis because, besides the theoretical support that they have developed, they have also identified possible determinant factors which could explain the capital choice decisions of a corporation.
3. Methodology

3.1. Defining, choosing and measuring the dependent and the explanatory variables

Within an empirical research, the links between the theoretical explanatory variables and the variables actually chosen for the purpose of the study are very complex and in order to justify such a choice, additional theories and empirical observations should be considered. Therefore, the selected variables can imply some drawbacks, such as the length of the causal sequence which associates the explanatory variables with the determinants suggested by the theory and with the dependent variable.

In order to measure the indebtedness of a company, authors of previous empirical studies such as Rajan and Zingales (1995) have used different classical measures of the capital structure. The broadest among them, which usually overestimates the level of leverage, is the ratio between the total capital from which the value of the equity was subtracted and the total assets. According to the available data, this study will consider as dependent variable a traditional measure of leverage:

\[
\text{Debt ratio}_t = \frac{\text{Total debt}_t}{\text{Total assets}_t}
\]  

\[ (1) \]

In order to observe the influence exerted by the factors specific to a firm on the capital structure of a company, previous studies analyzed traditional explanatory variables such as the company’s profitability, the size, the asset structure, the risk, the growth opportunities, the asset turnover, etc. Within this paperwork, we will seek to depict the relationship between a company’s level of leverage and the following determinant factors:

3.1.1 The profitability of the enterprise (Prof$_t$)

\[
\text{Prof}_t = \frac{\text{EBIT}_t}{\text{Total assets}_t}
\]

\[ (2) \]

The pecking order theory predicts a negative correlation between the profitability of a company and its total level of debt based on the idea that companies first turn towards internal financing resources (for instance, the profit) (Myers and Majluf, 1984). Even though the trade-off theory establishes a positive correlation between these variables given that a higher profitability implies a higher income that can be exempt from taxes (Kraus and Litzenberger, 1973), most empirical studies have indicated a negative influence of the profitability on the capital structure (Mazur, K., 2007).

3.1.2 The size of the company (Size$_t$)

\[
\text{Size}_t = \ln(\text{Total assets}_t)
\]

\[ (3) \]

Titman and Wessels (1988) argue that the size of a company and the extent to which it is indebted are positively correlated, motivating that large companies have more diverse activities and therefore, less risk of bankruptcy, fact that allows them to reach and maintain a higher level of debt.

3.1.3 The assets’ structure
The assets’ structure of a firm reflects the weight of each type of asset held by the company in its total assets. Among the financial indicators that measure how a company distributes its assets we distinguish the liquidity and the tangibility.

### 3.1.3.1 The tangibility of the assets ($Tang_t$)

$$Tang_t = \frac{\text{Non - current tangible assets}_t}{\text{Total assets}_t}$$

The fact that a company possesses fixed tangible assets to a large extent can be considered by its creditors as a guarantee that will allow them to recover their funds in the case of financial distress experienced by the borrower corporation. Therefore, increasing the percentage of tangible assets in the total assets will be perceived by investors as a positive measure and extending the level of debt in this situation would be something perfectly normal (Nivorozhkin, 2005).

On the other hand, in developing countries such as Romania, a high percentage of tangible assets in the total assets is not a guarantee of recovering the debt issued by lenders because the underdeveloped legal systems can delay or prevent this procedure in case of bankruptcy. In this sense, empirical studies for developing countries have shown that there is a negative correlation between the assets’ tangibility and the total leverage (Nivorozhkin, 2002).

### 3.1.3.2 The liquidity of the assets ($\text{Liquid}_t$)

$$\text{Liquid}_t = \frac{\text{Cash and bank accounts}_t}{\text{Total assets}_t}$$

According to the pecking order theory, firms with high liquidity levels can use this liquidity to finance their investments. Therefore, the liquidity of a company should exercise a negative impact on the debt ratio (Ozkan, 2001).

### 3.1.4 The asset turnover ($\text{Ass. turn}_t$)

$$\text{Asset turnover}_t = \frac{\text{Total sales}_t}{\text{Total assets}_t}$$

The total assets’ turnover is an indicator of efficiency which reflects how many times the capital invested in the total assets rotates in order to achieve the company’s turnover. Among those who have studied the influence of this indicator on the debt ratio of a company are Hutchinson and Hunter (1995) and O’Brien and Vanderheiden (1987).

### 3.2. The selection and gathering of data

The sample considered in this study comprises 20 companies listed on the Bucharest Stock Exchange, which operate in the Romanian construction sector and for which financial data from 2009-2011 were collected. Therefore, a total number of 60 observations available at www.bvb.ro
were analyzed in order to determine the behaviour of the companies regarding their financing decisions. The distribution of the companies according to the category within which they are traded on the exchange shows that most of the companies from the sample are traded over-the-counter on NASDAQ, only six being listed on BSE.

For the 2009-2011 period, the descriptive values of the annual debt ratio and of the explanatory variables considered in the study were computed (Table 1). On this basis, the graph of the evolution of the mean values of each variable over the three years was plotted and it was observed that the mean values present a constant evolution.

Table 1. Descriptive values of the variables for the years 2009-2011

<table>
<thead>
<tr>
<th>Variable</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>Std.Dev.</td>
</tr>
<tr>
<td>Debt ratio</td>
<td>0.3651</td>
<td>0.3413</td>
<td>0.2488</td>
</tr>
<tr>
<td>Profitability</td>
<td>0.0217</td>
<td>0.0217</td>
<td>0.1027</td>
</tr>
<tr>
<td>Company’s size</td>
<td>16,883</td>
<td>16,933</td>
<td>1,7696</td>
</tr>
<tr>
<td>Tangibility</td>
<td>0.4993</td>
<td>0.5167</td>
<td>0.2455</td>
</tr>
<tr>
<td>Liquidity</td>
<td>0.1088</td>
<td>0.0293</td>
<td>0.1341</td>
</tr>
<tr>
<td>Asset turnover</td>
<td>0.9335</td>
<td>0.5801</td>
<td>0.8915</td>
</tr>
</tbody>
</table>

For a period during which, on average, the turnover of the companies in the construction sector experienced a progressive annual reduction, it would be useful to analyze the evolution of the debt ratio of the companies in the sample. Therefore, as it can be seen in the figures below (Fig. 2), between 2009-2011, 8 companies had a total debt ratio above the average value for 2009, respectively 9 companies in 2010-2011. The highest growth of the debt indicator from one year to another was registered in the case of BERUC, between 2009-2010, this increase being followed by a further decrease to a level close to that recorded in 2009 (Fig. 1). On the other hand, SUT is the company with the lowest level of debt, followed by COMCM and ROMFOR.

Fig. 1. Differences with fixed base of the leverage level registered by the companies during 2009-2011

3.3 Applied econometric models

In order to identify the relationship between the selected explanatory variables and the capital structure of a company, we will choose both simple and multiple linear regression models, applied to panel data, given that the registered observations have a two-dimensional character: 20 companies are studied over a period of 3 years.
Panel data models can be of two types: (1) balanced panel—where there is one observation for each company, respectively, each moment, and (2) unbalanced panel—which implies that some observations are missing.

To estimate regression models based on panel data (in our case, balanced panel), we will use the Ordinary Least Squares method (OLS) - effective when the omitted explanatory variables and those variables considered within the model are not correlated. OLS is a method for estimating the regression coefficients and is generally used for one-dimensional data (time-series or cross-sectional data), but it is also applied to panel data, despite the fact that it ignores their double dimension.

To eliminate the inefficiency that could arise if a correlation exists between the unobservable effects (omitted explanatory variables) and the explanatory variables, we will also use the Fixed Effects Model for estimating the regressions. This model takes into account the heterogeneity of the companies that are part of the sample. In particular, it treats the unobservable effects as fixed effects, trying to control the phenomena which can influence the dependent variable— the debt ratio, and which are not included in the analyzed determinant factors. The linear form of the fixed effects model is an equation like:

\[ y_{it} = a_i + b x_{it} + \varepsilon_{it} \]

where \( i=1,...,n \) represents the company, \( t=\text{time}, \) \( y_{it}=\text{dependent variable- level of leverage}, \)
\( x_{it}=\text{independent variable of company i at time t}, a_i=\text{unobservable individual effect (omitted explicative variable) specific to the company i}, \varepsilon_{it}=\text{residual variable}. \)

Next, we will begin the analysis by introducing 5 simple linear regression models, each of them comprising the dependent variable— the debt ratio of a company and one explanatory variable. We will estimate the coefficients for these models and then we will compare the obtained \( R^2 \)-adjusted. The model with a maximum value for \( R^2 \)-adjusted implies that the independent variable included in that specific regression has the highest explanatory power. Therefore, it will be placed in another series of multiple models and combined with an additional independent variable. Knowing that an \( R^2 \)-adjusted which increases gradually as new variables are included in the model indicates an increase in the explanatory power of the regression, we will estimate the coefficients of the new multiple models with two factors of influence and we will choose that regression with a maximum \( R^2 \)-adjusted. Following this algorithm, we will obtain regressions comprising 3, 4 and 5 factors of influence. Finally, we will choose the regression model with the following characteristics: the highest possible number of explanatory variables and the highest explanatory power.

4. The results of the estimation and their interpretation

In the first step of the modelling, namely, obtaining simple linear regression, the following models and independent variables were considered:

**Model (1):** \( y_{it} = a_i + b x_{1it} + \varepsilon_{it}, \quad x_1=\text{profitability} \)

**Model (2):** \( y_{it} = a_i + b x_{2it} + \varepsilon_{it}, \quad x_2=\text{size} \)

**Model (3):** \( y_{it} = a_i + b x_{3it} + \varepsilon_{it}, \quad x_3=\text{tangibility of assets} \)

**Model (4):** \( y_{it} = a_i + b x_{4it} + \varepsilon_{it}, \quad x_4=\text{liquidity of assets} \)

**Model (5):** \( y_{it} = a_i + b x_{5it} + \varepsilon_{it}, \quad x_5=\text{asset turnover} \)

After estimating the coefficients of these models with the Gretl software package by using both OLS and FEM methods the following regressions were obtained:
Model (1): \[
\text{Debt ratio}_{it} = 0.372636 - 0.525972 \text{Prof}_{it} (FEM)
\]
\[
\text{Debt ratio}_{it} = 0.372636 - 0.55901 \text{Prof}_{it} (OLS)
\]
Model (2): \[
\text{Debt ratio}_{it} = -0.085854 + 0.0274498 \text{Size}_{it} (FEM)
\]
\[
\text{Debt ratio}_{it} = 0.39865 - 0.176499 \text{Size}_{it} (OLS)
\]
Model (3): \[
\text{Debt ratio}_{it} = 0.566521 - 0.398578 \text{Tang}_{it} (FEM)
\]
\[
\text{Debt ratio}_{it} = 0.58546 - 0.0438991 \text{Tang}_{it} (OLS)
\]
Model (4): \[
\text{Debt ratio}_{it} = 0.398965 - 0.176949 \text{Liquid}_{it} (FEM)
\]
\[
\text{Debt ratio}_{it} = 0.396219 - 0.152749 \text{Liquid}_{it} (OLS)
\]
Model (5): \[
\text{Debt ratio}_{it} = 0.378889 - 2.41577e-06 \text{Ass. turn}_{it} (FEM)
\]
\[
\text{Debt ratio}_{it} = 0.297445 + 0.101158 \text{Ass. turn}_{it} (OLS)
\]

The interpretations of the simple linear regressions, with FEM, are the following:

Model (1): When \(\text{Prof}_{it}\) increases with one unit, \(\text{Debt ratio}_{it}\) will decrease, in average, with 0.525972 units.

Model (2): When \(\text{Size}_{it}\) increases with one unit, \(\text{Debt ratio}_{it}\) will increase, in average, with 0.0274498 units.

Model (3): When \(\text{Tang}_{it}\) increases with one unit, \(\text{Debt ratio}_{it}\) will decrease, in average, with 0.398578 units.

Model (4): When \(\text{Liquid}_{it}\) increases with one unit, \(\text{Debt ratio}_{it}\) will decrease, in average, with 0.176499 units.

Model (5): When \(\text{Ass. turn}_{it}\) increases with one unit, \(\text{Debt ratio}_{it}\) will decrease, in average, with 2.41577e-06 units.

By comparing the \(R^2\) - adjusted (FEM) for these models we can observe that it takes the maximum value (of 0.890425) within the model (1). Therefore, we can say that the independent variable \(\text{X}_{1it}\) representing the company’s profitability has the highest explanatory power and as a consequence, the model (1) is the most representative at this stage.

According to the algorithm described in the previous chapter, starting from the determinant factor \(\text{X}_{1it}\), we will construct multiple regressions initially involving two explanatory variables:

Model (1a): \[y_{it} = a_1 + b_1 \text{X}_{1it} + c_2 \text{X}_{2it} + e_{it}\]

Model (2a): \[y_{it} = a_1 + b_1 \text{X}_{1it} + c_3 \text{X}_{3it} + e_{it}\]

Model (3a): \[y_{it} = a_1 + b_1 \text{X}_{1it} + c_4 \text{X}_{4it} + e_{it}\]

Model (4a): \[y_{it} = a_1 + b_1 \text{X}_{1it} + c_5 \text{X}_{5it} + e_{it}\]

Their coefficients were estimated resulting several multiple regressions from which we illustrate the most representative:

Model (1a): \[
\text{Debt ratio}_{it} = -1.85776 - 0.602235 \text{Prof}_{it} + 0.131685 \text{Size}_{it} (FEM)
\]
\[
\text{Debt ratio}_{it} = 0.535019 - 0.506291 \text{Prof}_{it} - 0.00957732 \text{Size}_{it} (OLS)
\]

When testing the correlation coefficient \(R^2\) - adjusted (FEM), it was observed that its maximum value (of 0.896030) occurs within the model (1a). Therefore, we can conclude that adding the explanatory variable representing the size of the enterprise increases the explanatory power of the model.

Next, we will construct regressions with 3 independent variables, having the following form:

Model (1b): \[y_{it} = a_1 + b_2 \text{X}_{1it} + c_2 \text{X}_{2it} + \text{D}_{2it} + e_{it}\]

Model (2b): \[y_{it} = a_1 + b_2 \text{X}_{1it} + c_3 \text{X}_{3it} + \text{D}_{3it} + e_{it}\]

Model (3b): \[y_{it} = a_1 + b_2 \text{X}_{1it} + c_4 \text{X}_{4it} + \text{D}_{4it} + e_{it}\]
Following the same procedure, the parameters of these models were approximated and the correspondent linear regressions were obtained, the selected one being the following:

\[
\text{Debt ratio}_{it} = 0.365303 - 0.537579 \text{ Prof.}_{it} + 0.0634109 \text{ Liquid.}_{it} \text{ (FEM)}
\]

Model (3b):

\[
\text{Debt ratio}_{it} = 0.373549 - 0.555087 \text{ Prof.}_{it} - 0.011104 \text{ Liquid.}_{it} \text{ (OLS)}
\]

The maximum correlation coefficient \( R^2 \)-adjusted (FEM) has the value of 0.913776 within the model (3b) indicating that the introduction of the asset turnover as an independent variable improves the model significantly. The models considered in the next phase are the following:

Model (1c):

\[
y_{it} = a_i + b_{x_{1it}} + c_{x_{2it}} + d_{x_{3it}} + e_{x_{4it}} + e_{it}
\]

Model (2c):

\[
y_{it} = a_i + b_{x_{1it}} + c_{x_{2it}} + d_{x_{3it}} + e_{x_{4it}} + e_{it}
\]

The coefficients and the values of \( R^2 \)-adjusted for the most representative model were obtained:

Model (1c):

\[
\text{Debt ratio}_{it} = -4.07207 - 0.855807 \text{ Prof.}_{it} + 0.25092 \text{ Size}_{it} + 0.185506 \text{ Ass. turn.}_{it} + 0.0917994 \text{ Tang.}_{it} \text{ (FEM)}
\]

\[
\text{Debt ratio}_{it} = 0.136545 - 0.881704 \text{ Prof.}_{it} + 0.0168096 \text{ Size}_{it} + 0.109538 \text{ Ass. turn.}_{it} - 0.658594 \text{ Tang.}_{it} \text{ (OLS)}
\]

It was found that the model with the highest explanatory power, based on an \( R^2 \)-adjusted equal with 0.911917 (FEM) is the model (1c). As we predicted, \( R^2 \)-adjusted continues to increase as we add new variables in the model.

Finally, based on the model (1c), we will estimate the most complex model, having the following form:

Model (1d):

\[
y_{it} = a_i + b_{x_{1it}} + c_{x_{2it}} + d_{x_{3it}} + e_{x_{4it}} + e_{it}
\]

After the estimation, we obtained the following numerical form of the model (1d):

\[
\text{Debt ratio}_{it} = -4.0244 - 0.874747 \text{ Prof.}_{it} + 0.247024 \text{ Size}_{it} - 0.10471 \text{ Tang.}_{it} - 0.0734664 \text{ Liquid.}_{it} + 0.19005 \text{ Ass. turn.}_{it} \text{ (FEM)}
\]

\[
\text{Debt ratio}_{it} = 0.190803 - 0.754848 \text{ Prof.}_{it} + 0.018693 \text{ Size}_{it} - 0.399527 \text{ Tang.}_{it} - 0.658594 \text{ Liquid.}_{it} + 0.155804 \text{ Ass. turn.}_{it} \text{ (OLS)}
\]

Table 2. Results of the econometric estimation for the most representative models with 1, 2, 3, 4, 5 variables.

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<th></th>
<th>(1)</th>
<th>(1a)</th>
<th>(3b)</th>
<th>(1c)</th>
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<td>-1.85776</td>
<td>-3.84723***</td>
<td>-4.07207***</td>
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Note: *** stands for the significance coefficients 1%, ** stands for the significance coefficients 5%, * stands for the significance coefficients 10%

Based on the Table 2, it can be observed that \( R^2 \)- adjusted increases progressively by adding new variables in a simple linear model and it reaches its maximum value of 0.911917 within the model (1c). On the other hand, by adding in the model (1d) the liquidity independent variable, \( R^2 \)- adjusted decreases, suggesting a decrease in the explanatory power of the last model. However, by analyzing the results for all the five representative models, based on data corresponding to the 20 companies from the sample, it can be observed that they are significant. In order to choose between the estimators obtained based on the method of ordinary least squares applied to panel data and those obtained by using the fixed effects model, the F test was applied, based on the null hypothesis \( H_0 \)-all free terms are fixed (there is no connection between the explanatory variables omitted and those included in the model), the null hypothesis was rejected and it was found that the best estimator is the model with constant effects. For this, the experimental values were plotted with yellow (■) and those estimated by the chosen model (1c) were marked with blue (+) (Fig. 3).

![Fig. 3. Experimental values of the debt ratio and the values adjusted by the model (1c), using the FEM technique](image)

5. Conclusions

Based on the obtained model, we assume that a firm’s capital structure is negatively influenced by its profitability and assets’ liquidity. Moreover, we confirm the results of previous empirical studies which have shown that, for developing countries, the tangibility of a company’s assets is negatively correlated with its debt ratio, given that a high level of tangible fixed assets does not represent a guarantee for creditors in case of default of the borrower company. On the other hand, the size of the company and its asset turnover are explanatory variables positively correlated with the level of debt. The empirical results of the study support the pecking order theory, according to which a profitable enterprise with a high level of liquidity will have a reduced level of debt.

The methodology adopted in this research shows that the explanatory variable with the strongest influence on the level of debt of a company is the profitability, followed by the
tangibility of the assets, the liquidity, the company’s size and the asset turnover.
This study represents a benchmark for future empirical research related to the internal factors specific to the businesses operating in the construction sector.

References