Determinant factors of firm leverage: An empirical analysis at Iasi county level

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Abstract

The paper investigates the determinants of capital structure of micro- and small enterprises based in the county of Iaşi in Romania. Our study employed debt ratio as the dependent variable and five factors (profitability, tangibility, liquidity, size, and growth opportunity) as determinants of capital structure. We have found that leverage is negatively related to tangibility, profitability and liquidity. The size of the firm and the growth opportunities can also have a negative impact on the leverage, but to a lower extent.

1. Introduction

The central concern of studies in the finance field has been the analysis of capital structure and of the determinants of firms’ financing decisions. The pace and intensity of studies focused on this topic show that these issues engage increasingly more researchers. The complexity of the problems (induced by the diversity of situations

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a firm may be in at any one time and the multitude of influencing factors), the lack of homogeneity of theoretical grounding, “innovation” in the of modelling economic and financial phenomena as well as the outcomes of research (which have confirmed or refuted previous results) have combined to produce a tumultuous path of theoretical research and empirical debates.

The main objective of this study is to analyse the factors affecting leverage. The case study was conducted on a sample of micro and small enterprises in the county of Iași.

Our paper is organised as follows. Section 2 presents a review of the relevant literature on capital structure. In section 3 we described the data, the research methodology, and the explanatory variables employed in the paper. The results are presented and discussed in section 4. Section 5 concludes the paper.

2. Literature review

2.1. Theoretical foundations of corporate financing

Three theories are prominent in the specific research: trade-off theory, agency theory, and pecking order theory; approached individually, these theories acknowledge a number of factors shaping the discussion of capital structure (i.e. leverage) of firms; each of the theories is built on a set of hypotheses in relation to which empirical research positions itself (either by confirming or refuting them).

According to trade-off theory companies define their optimal financial structure by balancing the benefits and costs of taking on additional debt; the benefits of leverage include the tax deductibility of interest and improved cash flow (Jensen, 1986); borrowing costs are assessed in terms of bankruptcy costs and the costs arising from the conflict of interest between shareholders and bondholders; for an optimal leverage level, the marginal gain balances the cost of debt. Further research along the line of maximising the firm’s valuation by increasing financing by borrowed funds has shown that the target debt ratio can be achieved in two phases: the static trade-off phase (during which a firm theory operates under the assumptions of the above-mentioned theory for a specific period, the example, one year); the dynamic trade-off phase (which allows successive adjustment steps by which a firm seeks to gradually achieve the target debt level). As a final development, trade-off theory postulates that a firm will borrow up to the point where the marginal value of the tax advantage of debt is balanced by the increase in the present value of bankruptcy costs.

Pecking order theory is premised on the idea that the order of resources prevails over their size. The costs of issuance of new securities override other considerations; in order to avoid such costs, firms prefer internal financing; if this proves insufficient, they resort to borrowing and, only as a last resort, to external financing through equity. The preference expressed by companies for financing their new projects mainly through self-financing, followed by debt and finally by share issues constitutes the pecking order, under asymmetric information conditions. Lately, a new pecking order theory has been designed for developed nations, characterised by a reassessment of the financing preference: retained earnings, equity and, finally, long-term debt.

Agency theory posits that an agent-type relationship exists between shareholders and managers; managers - as agents of shareholders - are required to act in the interest of the latter. However, managers do not always act in the interests of shareholders, but seek a range of personal benefits (higher salaries, additional earnings, job security and sometimes securing assets or cash flow). Recent research has shown that, although shareholders can deter such transfers of value (through the oversight, monitoring and control mechanism), the perfect monitoring of managers remains an unattainable goal.

2.2. The determining factors of capital structure

In the earliest research, the emphasis was placed on analysing the determinants of capital structure at firm level; subsequently, the scope of research expanded by incorporating in the analysis the factors specific to various industries. Later, research showed that the choice of capital structure is also influenced by a country's institutional environment and infrastructure.
Studies examining the role of variables specific to firms, industries and countries in defining firms’ financing policies suggest that all three categories of factors influence the corporate capital structure. Of the three factors, firm-specific ones exert dominant influence on the capital structure.

Given that firm-specific variables have the most wide-ranging implications on financial leverage, financial managers must focus primarily on such variables when making financing-related decisions. Most studies examine the influence of the following variables: a) asset tangibility; b) profitability; c) firm size; d) growth opportunities; e) external finance weighted average market-to-book (EFWA); f) the probability of bankruptcy; g) capital intensity; h) non-debt tax shields.

a) Asset tangibility. The main ideas put forward in the literature on tangibility - as a determining factor of the capital structure of the firm - are:
- firms with a high share of fixed assets also have increased borrowing capacity, the accepted assumption being that there is a positive relationship between asset tangibility and leverage; there have been numerous studies confirming this hypothesis, among them Titman and Wessels (1988), Rajan and Zingales (1995), and Booth et al. (2001);
- there are close links between long-term debt and tangibility (Wijst and Thurik, 1993);
- tangibility is particularly important if the firm is financially constrained, restricting its access to external resources; however, if the firm is financially constrained, tangibility is less important (Almeida and Campello, 2007);
- as a result of sizeable tangible assets, firms also record higher depreciation funds, which generate a boost in funds available for internal financing (to the detriment of external funding); in this particular case, there is a negative relationship between asset tangibility and leverage; findings show that asset tangibility is negatively correlated with leverage (and short-term debt) and positively correlated with long-term debt (Bas et al., 2009);
- the previously mentioned hypotheses remain valid irrespective of the legal regime (Alves Pereira and Ferreira, 2011);

b) Profitability. Contradictory theoretical predictions on the effects of profitability have been made.
According to trade-off theory, more profitable firms are less exposed to bankruptcy and have a greater incentive to take on debt in order to benefit from corporate debt tax shields (Jensen, 1986; Frank and Goyal, 2003) or to boost the firm’s performance (Margaritis and Psillaki, 2010).
Pecking order theory argues that profitable firms prefer self-financing to using external financing sources; as a result, profitability is negatively correlated with leverage. Most empirical studies have identified a negative relationship between leverage and profitability (Titman and Wessels, 1988; Rajan and Zingales, 1995; Booth et al., 2001; Huang and Song, 2002; Fan et al., 2006; de Jong et al., 2006).

c) Firm size. The assessment of firm size is performed by considering two benchmarks: the number of employees (Bas et al., 2009) or the sales logarithm (Kayo and Kimura, 2011).
In the earliest research (Rajan and Zingales, 1995), the explanation of the positive relationship between leverage and firm size was based on the financial distress costs, recognising that larger firms face lower bankruptcy costs and have more diversified portfolios (with a lower bankruptcy probability).
As regards the theoretical grounding, there are common views on the relationship between firm size and leverage. Trade-off theory admits that firm size has a positive capitalisation effect. In the same spirit, pecking order theory postulates that since large firms are more diversified and have less volatile earnings, problems arising due to information asymmetry can be mitigated. The generally accepted assumption is that, in the case of large firms, firm size is positively correlated with leverage. Accepting the previously formulated hypothesis, which states that large firms may have a greater debt carrying capacity, Byoun (2008) argues that large firms, being generally more transparent, tend to have higher levels of leverage and the diversification of leverage alternatives may lead to savings in debt issuance costs. In contrast, for smaller firms, financial institutions must allocate more resources to monitor and are likely to “punish” them, by imposing higher interest rates (Alves Pereira and Ferreira, 2011).
Assuming that for large companies, size is positively correlated with leverage, other authors (Bas et al., 2009), based on empirical research, conclude that, for smaller firms, firm size is negatively correlated with leverage.

d) Growth opportunities. Agency theory suggests that there is a negative relationship between growth opportunities and leverage. To support this postulation, the initial assumption is that debt plays a “disciplinary” role,
mitigating managers’ opportunistic behaviour (Kayo and Kimura, 2011); such behaviour is more noticeable when the company cash flow is high; when the company undergoes a high growth phase, with investment opportunities that offer positive net present value, free cash flow is low and conflicts between shareholders and managers are less intense; on the other hand, when growth opportunities are limited, free cash flow may trigger typical problems (adverse selection costs, moral hazard, and excessive earnings); in this context, debt plays a key role in motivating managers to be more effective (Jensen, 1986).

In conclusion, agency theory assumes that managers behave opportunistically and rationally, attempting to maximise their own benefits at the expense of shareholders; leverage disciplines such behaviour, which causes firms with few investment opportunities and high cash flow to make greater use of debt (Kayo and Kimura, 2011).

Pecking order theory suggests a positive relationship between growth opportunities and leverage, admitting that capital structure derives from asymmetric information available to managers and investors. The pecking order theory recognises that managers are rational, but not necessarily opportunistic (in the maturity stage, debts no longer exert the same disciplinary effect on managers, as in agency theory) (Kayo and Kimura, 2011).

Other authors (Alves Pereira and Ferreira, 2011) prefer to use another variable as a proxy for the firm’s growth opportunities – i.e. market-to-book (MB); illustrating the existence of evidence for both correlations (positive and negative), they have shown that the MB variable exerts a varying influence on leverage, based on whether EFWA (external finance weighted average market-to-book) is factored in the analysis.

e) External finance weighted average market-to-book (EFWA). According to research carried out by Baker and Wurgler (2002), firms choose to issue equity when stock is overvalued (integrating this issue into the market timing theory) and use EFWA as a proxy to estimate synchronisation with the market. The authors of these studies identified a negative correlation between leverage and EFWA.

f. Probability of bankruptcy. The probability of bankruptcy is estimated using the Altman’s Z-score. The vast majority of studies agree that companies that are financially sound (i.e. have a low probability of going into bankruptcy) tend to have lower debt levels (Byoun, 2008; Kayo and Kimura, 2011).

g) Capital intensity. This variable is assessed using the ratio of the employment rate and fixed assets, being a proxy for the operating leverage. A high level of the indicator shows an increased risk of variation of future earnings; therefore, decision-makers – seeking to retain control – and creditors – concerned with the risk of financial distress – will resort less to leverage when considering the issue of labour automation as a production factor. Accepted assumptions include: capital intensity is positively correlated with total debt and long-term debt and negatively correlated with short-term debt; empirical studies have shown that, in practice, only the last hypothesis is verified.

h) Other tax shields providing tax benefits. This category, most often, refers to depreciations.

To decrease their tax burden, firms seek to exploit the tax deductibility of interest. If firms also have further tax deductible items (which provide a tax shield, such as depreciation), other than their debts, then the leverage effect is low.

g) Liquidity. Lipson and Mortal (2009) analysed the influence exerted by liquidity of the capital structure of firms. Empirical studies have shown that there is a negative correlation between the two variables (liquidity and capital structure).

3. Data and methodology

The data set used in the analysis was constructed by collecting information from companies’ balance sheets and income statements obtained from the Tax Offices of Iași county. The sample includes data covering 3 years, from 2008-2010, resulting in a panel database of 1,155 cases for 385 companies. The criteria used for choosing the companies were the availability and quality of data for a time period of 3 years (2008-2010).

The dependent variable is the debt ratio (TDR), the ratio between total debt and total assets. In specialist literature other indicators of the level of leverage are used, such as the long-term debt ratio short-term debt ratio.

In the category of independent variables we selected five firm-level determinants, namely:

a) profitability, determined by the ROA indicator = the return on assets;

b) asset tangibility (TANG) = the ratio of tangible to total assets;
c) firm liquidity (LIQ) = the current ratio, which measures the firm’s liquidity based on the ratio of current assets to current liabilities;

d) firm size (SIZE) = can be estimated using several indicators, including the number of employees, the logarithm of sales or the size of total assets; in this study, the natural logarithm of total assets is used as a proxy for firm size;

e) growth opportunities (GROP) = to determine and assess this indicator the following options are available:
- the ratio of the firm’s market value (namely, the ratio of the firm’s total debt and equity to market value) to total assets;
- the ratio of turnover growth rate and the growth of total assets; since companies in our sample are not listed on the stock market, we have calculated growth opportunities using the second ratio.

We employed a fixed effects regression model in order to study the determinants of leverage for micro- and small enterprises located in Iași county. We have chosen to use a fixed effects model because it has the potential to control for unobserved heterogeneity between firms that is constant over time and correlated with independent variables. We model the leverage of an \( i \)-th company at time \( t \) as follows:

\[
TDR_{it} = c_i + \beta_1 \cdot ROA_{it} + \beta_2 \cdot TANG_{it} + \beta_3 \cdot LIQ_{it} + \beta_4 \cdot SIZE_{it} + \beta_5 \cdot GROP_{it} + \alpha_i
\]

where:

\( TDR_{it} \) stands for book leverage of firm \( i \) in the year \( t \);
\( ROA_{it} \) are profitability measures of firm \( i \) in the year \( t \);
\( TANG_{it} \) – asset tangibility of firm \( i \) in the year \( t \);
\( LIQ_{it} \) – liquidity of firm \( i \) in the year \( t \);
\( SIZE_{it} \) – size of firm \( i \) in the year \( t \);
\( GROP_{it} \) – growth opportunity of firm \( i \) in the year \( t \);
\( c_i \) – error term of firm \( i \) in period \( t \);
\( \alpha_i \) denotes firm-level fixed effects.

The sectorial influence over financial variables was not included in the analyses because it was not possible to appropriately capture the influence of business sectors on the financial structure, due to the lack of access to information.

### 4. Empirical findings and discussion

The fixed effects regression model includes 1,155 observations over three years (2008-2010) for 385 micro- and small enterprises in Iași county. Table 1 presents the descriptive statistics of all variables. As shown in table 1, all of the variables, except growth opportunity, have a positive mean. Furthermore, mean statistics produce some important results. First, the mean of debt ratio (TDR) indicates that micro and small enterprises in Iași county prefer to finance their assets through debt rather than equity.

Table 1. Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>TDR</th>
<th>ROA</th>
<th>TANG</th>
<th>LIQ</th>
<th>SIZE</th>
<th>GRO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.835023</td>
<td>0.141649</td>
<td>0.275943</td>
<td>1.463912</td>
<td>13.45983</td>
<td>-0.082828</td>
</tr>
<tr>
<td>Maximum</td>
<td>2.558617</td>
<td>0.600786</td>
<td>0.807703</td>
<td>6.036156</td>
<td>16.33472</td>
<td>4.625954</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.211350</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>10.32911</td>
<td>-13.94131</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.478173</td>
<td>0.180355</td>
<td>0.280587</td>
<td>1.218127</td>
<td>1.515495</td>
<td>3.160993</td>
</tr>
<tr>
<td>Observations</td>
<td>1,155</td>
<td>1,155</td>
<td>1,155</td>
<td>1,155</td>
<td>1,155</td>
<td>1,155</td>
</tr>
</tbody>
</table>

Table 2 shows the estimation results of model. All of the independent variables employed in the model appear to be statistically significant determinants of leverage. The analysis of the regression coefficients in the model indicates that, in the representative sample for Iași county, the leverage level is negatively influenced by the examined indicators: asset tangibility, firm profitability, liquidity, firm size and, to a lesser extent, growth opportunities.
The previous empirical studies suggest that tangibility is positively related to capital structure due to the fact that tangible assets can be used as collateral for bank loans. Our results show that tangibility is negatively related to capital structure, because micro and small enterprises have fewer assets to provide to banks as collateral. These findings are consistent with previous studies by Rajan and Zingales (1995), Wald (1999), Booth et al. (2001), and Kayo and H. Kimura (2011).

Our results confirm the pecking order theory. According to it, there is a negative relation between leverage and profitability. Enterprises with high level of profitability prefer to finance using retained earnings rather than debt and equity. The results are broadly in line with those obtained by Rajan and Zingales (1995), Booth et al. (2001), Huang and Song (2002), Fan et al. (2006), de Jong et al. (2006), Chakraborty (2010), and Kayo and Kimura (2011).

In keeping with the related theoretical and empirical literature, a negative relation was expected between liquidity and capital structure. Micro- and small enterprises with more liquidity prefer to use equity in their capital structure than debts. Our results also confirm that liquidity is negatively related to leverage, in line with the well-established findings of previous studies Lipson and Mortal (2009).

The size of the firm appears to have a negative correlation with leverage, a finding that is consistent with previous research carried out by Rajan and Zingales (1995), Alves Pereira and Ferreira (2011), and Bas et al. (2009).

We also found that growth opportunities have a negative relationship with leverage, a result consistent with those obtained by Rajan and Zingales (1995), Booth et al. (2001), and Kayo and Kimura (2011).

5. Conclusion

The aim of the paper was to analyse the determinants of capital structure of micro- and small enterprises operating in the county of Iași in Romania. We employed a fixed effects regression model with debt ratio as dependent variable and five factors (profitability, tangibility, liquidity, size, and growth opportunity) as determinants of capital structure.

We have found that tangibility has a negative impact on leverage. The results of the estimation model show that profitability is negatively related to leverage which is consistent with Rajan and Zingales (1995), Booth et al. (2001), Chakraborty (2010), and Kayo and Kimura (2011). As expected, the relationship between liquidity and leverage appears to be negative and significant. Our regression results show that firm size is negatively related to leverage. Growth opportunities have a negative relationship with leverage, which is consistent with results obtained by Rajan and Zingales (1995), Booth et al. (2001), and Kayo and Kimura (2011).

As the selection of explanatory variables was influenced by lack of some data, we consider that our analysis could be expanded by incorporating other determinants of capital structure, such as industry-level and country-level variables, as soon as the data becomes available.

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