Capital Structure Determinants of SMEs: Empirical Evidence

Abstract: This paper focuses on the determinants of the capital structure of SMEs in the Brazilian context. The observed firms were selected with a stratified sampling method, which allowed to improve the quality of the estimates. The financial statements data were collected through a questionnaire and the observation time horizon was three years. To achieve the research objectives, we followed a panel data methodology, using the ordinary least squares regression (POLS) model. This setting has the advantage of detecting the best effects and reducing bias. Our data showed no collinearity problems. To analyze the capital structure, we referred to trade-off theory and pecking order theory. The results are mostly following the latter theory. In particular, empirical findings show that the age and profitability of the company are negatively correlated with debt. Assets tangibility, growth and size have a positive relationship with debt, following both theories analyzed.

Keywords: Financial behaviour, Capital Structure, Debt, Profitability, SMEs.

INTRODUCTION

The capital structure concerns the components of capital (debt and equity) that firms use to finance their investments (Modigliani & Miller, 1958, 1963; Fama & French, 2002; Frank & Goyal, 2009).

Given that the capital structure has an important impact on the value and profitability of the company, the study of the financial behaviour of companies plays a crucial role in the survival and development of any company (Harris & Raviv A., 1991; Sensini L., 2020; Rajan R. & Zingales L., 1995; Noulas & Genimakis, 2011; Chen et al., 2014). Although the literature has extensively covered this topic over the past sixty years, the issue of the capital structure remains an unsolved question today (Myers, 2001).

Furthermore, the optimal capital structure is influenced by the reference competitive environment, the sector to which it belongs and the economic context (Chalmers et al., 2020; Hall et al., 2004; Sensini, 2017). Consequently, the results obtained in one sector and one context may not be applicable in other sectors and other contexts.

Furthermore, as widely emphasized by the literature, the results obtained for large companies are not entirely attributable to SMEs, as size represents a relevant factor in the choices regarding the capital structure (Mannetta et al., 2017; Rao et al., 2019; Booth et al., 2001; Chen et al., 2014; Mac an Bhaire & Lucie, 2010).

Therefore, finding the optimal combination of debt and equity is not easy. In the context briefly outlined, this paper focuses on the capital structure of Brazilian manufacturing SMEs based in the province of Rio de Janeiro. We have chosen to focus on SMEs because companies represent the backbone of the economy and are the growth engine of the local economy, as happens in many other countries (Alvarez et al., 2019; Diaz & Sensini, 2020; Mannetta et al., 2014; Chalmers et al., 2020).

These companies are very often characterized by financial constraints that affect their financing decisions. Indeed, most SMEs use equity or self-financing to finance investments (Sanchez & Sensini, 2017; Chen et al., 2014; López-Gracia & Sogorb-Mira, 2008; Bello & Sensini, 2020).

These decisions are often obligatory and force companies to take little advantage of the benefits obtainable from financial leverage. In fact, as highlighted by the literature, under certain conditions, financial leverage is preferable to the use of equity (Chalmers et al., 2020).

Therefore, given the structural and functional fragility of SMEs, these companies need to make effective and efficient financing decisions to facilitate their survival and development and avoid the risk of bankruptcy (Gaud et al., 2007; Sanchez & Sensini, 2013; Newman et al. 2012; Campos et al., 2014; Amendola et al., 2011a; Norton, 1991).
In this perspective, these companies must therefore be careful to control the key variables that could. Traditional literature initially studied the financial choices of large firms. In recent years, many authors have begun to study this topic also regarding SMEs (Degryse et al., 2012; Sensini, 2020; Benkraiem & Gurau, 2013). However, the results are mixed. Furthermore, studies that have addressed this topic in the Brazilian economy are very rare. In this regard, this paper aims to enrich the existing literature on the financial behaviour of firms, providing further empirical evidence regarding a still little-known economic context. Furthermore, the research results can be useful to SME entrepreneurs and managers to improve financial decisions.

The rest of this paper is organized as follows. Section 2 contains a brief review of the literature. Section 3 discusses the methodology used. The results of the study are highlighted in section 4, while the last section contains the concluding remarks.

**LITERATURE REVIEW**

Over time, after the seminal papers of Modigliani and Miller (Modigliani & Miller, 1958, 1963), the literature has developed numerous theories on the financial behaviour of firms. The seminal theories of Modigliani and Miller played a fundamental role in the development of subsequent theories, but these theories were based on the hypothesis of a perfect market and therefore found little adherence to reality.

Later other theories were proposed that tried to overcome the previous limitations. Among these, the main ones are the trade-off theory and the pecking order theory.

The trade-off theory (Kraus & Litzenberger, 1973) has suggested that optimal financial decisions are aimed at reaching a compromise between tax advantages, debt and the risk of bankruptcy (Jensen & Meckling, 1976; Cassar & Holmes, 2003).

The pecking order theory (Myers, 1984; Myers & Majluf, 1984) does not suggest an optimal capital structure but argues that firms finance themselves according to a hierarchical order that favours first external funds, then debts and finally capital (Cosh & Hughes, 1994; Vos et al., 2007).

To assess the soundness of these theories, numerous empirical studies have investigated financial behaviour using certain characteristics of firms, such as age, assets tangibility, profitability, growth rate and size (Abor, 2008; Aggarwal R., 1981; Sensini, 2020; Aybar-Arias et al., 2012).

Below, we proceed to a brief description of the positions of the literature concerning each of the variables just mentioned.

The age of the enterprise refers to the number of years that the companies are operational. In this regard, the theories examined are conflicting, as they foresee a different relationship between age and debt.

According to the trade-off theory, the age of the firm has a positive relationship with debt. Companies that have been in business for several years have stronger and longer-lasting relationships with banks and lenders and therefore have easier access to loans. Conversely, according to the pecking order theory, older companies have managed to accumulate more profits over time and therefore can use these profits to finance their investments. In this perspective, the theory assumes a negative relationship between age and debt (Handoo & Sharma, 2014; Michaelas et al., 1999).

Assets tangibility can represent the stability and soundness of a company, as it is made up of assets that can be sold and converted into cash. Consequently, a firm with larger tangible assets may offer more collateral to creditors, while a company with few tangible assets may offer less collateral.

**On this point, both theories agree.**

In this regard, the trade-off theory suggests a positive relationship between tangible assets and debt, as these assets can be used as collateral for creditors (Titman & Wessels, 1988; Jimenez et al., 2004; Sbeti & Moosa, 2012). The Pecking Order theory suggests a positive relationship between assets tangibility and debt, as these assets reduce the problems of information asymmetry and represent collateral for financing (La Porta et al., 1998).

The profitability of the firm can be defined as the ability of the firm to make profits. On this point, the two theories have a conflicting view.

According to the trade-off theory, company profitability has a positive relationship with debt, as profitable companies they are more likely to have access to finance and can reassure lenders about their repayment capacity (Fama & French, 2002; Rajan & Zingales, 1995; Booth et al., 2001).

According to pecking order theory, profitability has a negative relationship to debt, as profitable firms prefer to use retained earnings to finance their investments (Vos et al., 2007; Van der Wijst & Thurik, 1993).

Growth is represented by the ability of the company to increase its volume of activity over time. In this regard, the two theories have a different view on the relationship between growth and debt.
The trade-off theory suggests a negative relationship between growth and debt, as the increase in growth-related intangible assets leads to a greater risk of financial distress and therefore firms prefer not to take out another financing.

The pecking order theory highlights a positive relationship between growth and indebtedness, as growing companies, while respecting a hierarchical order; prefer to borrow (Harris & Raviv, 1991; Sensini, 2017; Degryse et al., 2012).

The size of the firm represents an important element in explaining the financial choices of firms and, in this regard, both theories are in agreement (Bevan & Danbolt, 2002).

Overall, 136 SMEs participated in the research.

The debt was used as a proxy to explain the financial behaviour of SMEs. The variables were determined as shown in Table 1.

Table 1 – Variables of interest

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD</td>
<td>Total debt</td>
</tr>
<tr>
<td>AGE</td>
<td>Firm age</td>
</tr>
<tr>
<td>AT</td>
<td>Assets Tangibility</td>
</tr>
<tr>
<td>PROF</td>
<td>Profitability</td>
</tr>
<tr>
<td>TG</td>
<td>Turnover Growth</td>
</tr>
<tr>
<td>SIZE</td>
<td>Size</td>
</tr>
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</table>

To achieve the research objectives, we used a panel data methodology. This setting has several advantages, including detecting the best effects and reducing bias. Among the different methodologies that can be used, we have chosen the ordinary least squares regression model (POLS).

Therefore, we used the following regression model:

\[ TD_{it} = \beta_0 + \beta_1 \text{AGE}_{it} + \beta_2 \text{AT}_{it} + \beta_3 \text{PROF}_{it} + \beta_4 \text{TG}_{it} + \beta_5 \text{SIZE}_{it} + \epsilon_{it} \]

Where:

- \( TD_{it} \): Debt ratio of firm \( i \) at time \( t \)
- \( \text{AGE}_{it} \): Age of firm \( i \) at time \( t \)
- \( \text{AT}_{it} \): Assets Tangibility of firm \( i \) at time \( t \)
- \( \text{PROF}_{it} \): Profitability of firm \( i \) at time \( t \)
- \( \text{TG}_{it} \): Turnover Growth of firm \( i \) at time \( t \)
- \( \text{SIZE}_{it} \): Size of firm \( i \) at time \( t \)
- \( \epsilon_{it} \): Stochastic error term

We also verified the possible presence of collinearity problems between the explanatory variables, noting that this problem does not exist.

RESULTS AND DISCUSSION

Table 2 shows the descriptive statistics relating to the mean, median and standard deviation trends of all variables throughout the observed period.
As can be clearly seen from the results of the previous table, SMEs mainly used their own resources and equity capital to finance investments. The companies have an average age of about 18 years, tangible assets represent about 40% of total assets and growth was about 50%.

Table 3 shows the results related to the regression analysis performed with the POLS method.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Std Error</th>
<th>T-st</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costant</td>
<td>0.259</td>
<td>0.041</td>
<td>5.891</td>
<td>0.000</td>
</tr>
<tr>
<td>AGE</td>
<td>-0.038</td>
<td>0.016</td>
<td>-2.765</td>
<td>0.004</td>
</tr>
<tr>
<td>TAS</td>
<td>0.215</td>
<td>0.057</td>
<td>3.723</td>
<td>0.000</td>
</tr>
<tr>
<td>PROF</td>
<td>-0.045</td>
<td>0.094</td>
<td>-0.419</td>
<td>0.653</td>
</tr>
<tr>
<td>TGR</td>
<td>0.003</td>
<td>0.001</td>
<td>1.796</td>
<td>0.065</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.219</td>
<td>0.059</td>
<td>3.819</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The results show that the age of the firm is negatively correlated with debt, in line with the pecking order theory. This empirical evidence shows that SMEs that have been on the market for the longest time prefer to use internal sources of finance instead of debt to finance their investments. These results are consistent with other studies (Chen & Sensini, 2014; Forte et al., 2013; Saarani & Shahadan, 2013).

In agreement with both theories analyzed, the results show that assets tangibility has a positive and significant relationship with debt. Therefore, companies that have more material assets have easier access to credit, as they can use these assets as collateral for granting loans.

The results are consistent with what emerged in other studies (Saarani & Shahadan, 2013; Md-Yusuf et al., 2011).

Following the pecking order theory and in contrast with the trade-off theory, the results show a negative but insignificant relationship between profitability and debt. Therefore, companies prefer to use their profits to finance investments rather than borrowing from the banking system.

Following the pecking order theory, the results show that the firm’s growth rate has a positive relationship with debt. Therefore, companies do not have sufficient internal resources to finance growth and, consequently, must resort to debt. However, the results are not statistically significant.

Following both theories, firm size has a positive and significant relationship with debt. As the size increases, the problems of information asymmetry, financial burdens and bankruptcy costs are reduced. As a result, larger companies prefer to borrow rather than use their own resources. These results are consistent with other previous studies (Ang et al., 1982; Chalmers et al., 2018; Sensini, 2020; Aggarwal, 1981).

Concluding remarks

This paper focuses on the determinants of the capital structure of SMEs concerning the Brazilian context. We preferred to study small and medium-sized enterprises because these companies represent the main growth engine of the local economy. Therefore, given the structural and functional fragility of SMEs, these companies have to take effective and efficient financing decisions to facilitate the survival and development and avoid the risk of failure.

The firms observed were selected with a stratified sampling method, which allowed us to improve the quality of the estimates. The financial statements data were collected through a questionnaire and concern the period 2016-18. Overall, the sample consists of 136 SMEs.

To achieve the research objectives, we used a panel data methodology, as this setting allows us to detect the best effects and reduce bias. Among the different methodologies that can be used, we have chosen the ordinary least squares regression model (POLS). We also verified that our data showed no collinearity problems.
The results showed that the age of the firm is negatively correlated with debt, in line with the pecking order theory.

The tangibility of assets has a positive and significant relationship with debt, following both theories analyzed. Profitability is negatively correlated with debt, following the theory of pecking order and in contrast with the trade-off theory. Growth has a positive relationship with debt.

However, the results relating to profitability and growth are not statistically significant. Finally, dimension has a positive relationship to debt, in line with both theories.

This paper is important from several perspectives. First, this study enriches the existing literature on the financial behaviour of firms, providing further empirical evidence regarding a still poorly understood economic context. Second, the research findings can be useful to SME entrepreneurs and managers to improve financial decisions and aid the survival and development of the company.

REFERENCES


Conference on Economics, Finance and Risk, pp. 139-163.


