The determinants of leverage of SMEs: empirical evidence from an emerging economy

Abstract: This paper aims to investigate the relationship between financial leverage and its main determinants in the context of SMEs in an emerging economy, such as the Chilean one. The investigation is based on the application of trade-off theory and pecking order theory. In this regard, the literature has amply highlighted that these two theories are more suitable for explaining the financial decisions of SMEs. We used a stratified sampling technique based on an economic criterion to identify the companies to analyze and develop the empirical analysis. The period investigated is three years and runs from 2016 to 2018. The research hypotheses were tested with a static fixed effects model (FE). The robustness checks validated the reliability of the model used. The results suggest that the size and tangibility of assets have a positive and statistically significant influence on debt. Conversely, profitability has a negative and statistically significant influence on leverage. The results of this research contribute to enriching the literature on the subject, providing empirical evidence of an economic context that has not yet been studied.

Keywords: Leverage, Capital Structure, Emerging Economy, Performance

1. INTRODUCTION

Since the first essays by Modigliani and Miller (1958; 1963), the financial behaviour of firms has been the subject of intense attention in the financial literature (Aggrawal, 1981; Allen, 1993; Frank and Goyal, 2009; Newman et al., 2012; Sensini, 2020; Diaz & Vicente, 2020; Chen et al., 2021).

Over time, scholars have proposed various theories to explain business financial decisions. However, the different models proposed by the literature are not able to uniquely explain the financial behaviour of firms.

A relevant variable in discriminating the validity of the models proposed by the literature is represented by the dimension (Cassar and Holmes, 2003; Sogorb-Mira, 2005; Palacín-Sánchez et al., 2012; Saarani & Shahadan, 2013; Mannetta et al., 2017; Mueller & Sensini, 2021; Williams et al., 2016).

In this perspective, the prevailing literature has largely suggested that the theories and empirical models proposed for large firms cannot be applied to SMEs (Chen et al., 2014; Ivanov & Vicente, 2017; Sensini, 2017; Chalmers & Mannetta, 2017).

Furthermore, many scholars have highlighted that even the sector to which they belong can significantly influence the financial behaviour of companies (Wald, 1999; Mannetta et al., 2015; Sensini, 2017; Mueller et al., 2019; Chalmers, 2020a, Chen et al., 2019; Amendola et al., 2021).

Initially, the literature sought to validate the different theories by focusing mainly on the economically more developed countries (Ozkan, 2001; Bevan and Danbolt, 2002; Psillaki and Daskalakis, 2009; Al-Najjar and Hussainey, 2011). This circumstance is essentially attributable to the greater availability of data. However, over the last twenty years, some studies on the financial behaviour of firms in developing countries have become widespread (Booth et al., 2001; Abor, 2008; M'd-Yusuf et al., 2013; Handoo and Sharma, 2014).

In line with this more recent literature, this paper analyzes the financial decisions of Chilean manufacturing SMEs. The reasons for this choice are different and better explained below.
First, studies on the economy of this country are not very widespread. Consequently, this article can enrich the existing literature by providing additional empirical evidence in the context studied.

Secondly, SMEs are the engine of the country's economy, therefore their financial behaviour and their state of health represent a primary interest for the economy and employment.

Furthermore, the banking system represents the main source of financing for these companies in emerging economies, as financial markets are less developed (Sensini, 2014; Mannetta et al., 2014; Sanchez and Sensini, 2017). Consequently, SMEs in these countries are more fragile than those in developed countries (Sensini, 2003; Hughes et al., 2013; Mannetta et al., 2013; Alvarez et al., 2013; Diaz et al., 2014).

In the context just outlined, financial decisions, therefore, assume fundamental importance for the survival and development of SMEs and for reducing the risk of bankruptcy (Sanchez and Sensini, 2013; Newman et al., 2007; Campos et al., 2014; Sensini, 2016).

In this perspective, the results of this research can support entrepreneurs in making financing choices suited to the characteristics of their business.

The manufacturing companies analyzed were selected with a stratified random sampling technique based on an economic criterion. This approach made it possible to improve the efficiency of the estimates and to include SMEs with sufficiently different qualitative and quantitative characteristics in the sample.

The financial statements data were collected through a questionnaire and concerned the three years 2016-2018. Overall, 76 companies participated in the survey. The research hypotheses were tested with a fixed effects (FE) statistical model and were further validated with a robustness check.

The paper is organized with this structure. The second section examines the reference literature and defines the research hypotheses. The third section discusses the methodology and the next section analyzes the results. The last section develops the concluding remarks.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

Over the last few decades, the literature has largely focused on the financial behaviour of firms, developing several theories that have been tested on firms of different sizes from different economic backgrounds (Jensen and Meckling, 1976; Myers, 1984; Berger and Udell, 1998; among others). This study focuses on the trade-off and the pecking order, in agreement with the prevailing literature which deems these theories more adequate to explain the financial decisions of SMEs in the context of emerging economies.

The trade-off theory is based on the fiscal benefits of debt, the costs of bankruptcy and agency costs (Kraus and Litzenberger, 1973), suggesting that there is optimal financial leverage achievable by adequately balancing these variables.

The pecking order theory suggests that firms finance themselves following a hierarchical order and excludes the possibility of achieving an optimal level of financial leverage. In this perspective, companies first use internal financial resources, then debts and, finally, the new capital.

The two theories used in this study have been applied in numerous empirical studies that investigated the financial decisions of firms.

In this study, following the prevailing literature, we use the most significant determinants, namely size, profitability, tangibility and growth of assets (Watson and Wilson, 2002; Vos et al., 2007; Chalmers et al., 2020).

Therefore, in line with this approach, we have developed research hypotheses for each determinant of firms' financial behaviour.

Size

The two theories suggest a positive relationship between size and debt while using different perspectives. The larger size facilitates access to credit at lower costs, reducing the information asymmetry with financial intermediaries and the risk of financial difficulties (Fama & French, 2007). Following both theories, we have therefore developed the following research hypothesis:

**H1:** Size has a positive relationship with debt.

Profitability

The trade-off theory states that profitable firms use the loan more to take advantage of the tax advantages associated with debt (Fama and French, 2002). Consequently, this theory suggests that the relationship between profitability and debt is positive.

In contrast, the pecking order theory suggests that the most profitable companies self-finance their investments. Consequently, this theory suggests a negative relationship between profitability and debt (Degryse et al., 2012).

In this paper, we agree with the pecking order theory and therefore we have developed the following research hypothesis:
H2: profitability is negatively correlated with debt.

The tangibility of Assets

Both theories support a positive relationship between asset tangibility and financial leverage (Mannetta, 2017; Mueller & Sensini, 2021; Amendola et al., 2021). Therefore, our third research hypothesis is as follows:

H3: Asset tangibility has a positive relationship to debt.

Growth

The trade-off theory suggests a negative relationship between growth and leverage (Fama and French, 2002).

Conversely, the pecking order theory suggests a positive relationship between growth and leverage (Gaud et al., 2005; Dang & Garrett, 2015).

In this paper, we agree with the pecking order theory and therefore we have assumed the following relationship:

H4: Growth has a negative relationship to debt.

3. METHODOLOGY

This paper intends to investigate the financial behaviour of SMEs in an emerging economy, analyzing the relationship between the main drivers and debt.

We selected a sample of companies with a stratified sampling technique, adding an economic criterion. This approach made it possible to analyze companies that were sufficiently different in terms of turnover, the number of employees and invested capital (Amendola et al., 2020; Chen et al., 2019).

The financial statements data were collected with a questionnaire and concerned the period from 2016 to 2018.

The analysis was based on the 4 variables previously described, which were determined as indicated in table 1.

### Tab. 1 - Variables

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Explanatory Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leverage</td>
<td>Ratio Total Liabilities/Total Assets</td>
</tr>
<tr>
<td></td>
<td>Logarithm of Total Assets</td>
</tr>
<tr>
<td></td>
<td>Ratio EBITDA/Total Assets</td>
</tr>
<tr>
<td></td>
<td>Ratio Fixed Tangible Assets/Total Assets</td>
</tr>
<tr>
<td></td>
<td>Ratio (Total Assets_i,t − total Assets_{i,t-1})/Total Assets_{i,t-1}</td>
</tr>
</tbody>
</table>

The research hypotheses were tested with a static fixed effects model (FE), setting up the following regression model:

\[
LEV_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PROF_{it} + \beta_3 TAN_{it} + \beta_4 GROW_{it} + \epsilon_{it}
\]

Where LEV is the financial leverage of firm i in year t, and the determinants are represented by size (SIZE), profitability (PROF), asset tangibility (TAN) and growth, while \(\epsilon\) represents the stochastic error.

Table 2 summarizes the results of the analysis.

### Tab. 2 – Descriptive statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>StDev</th>
<th>LEV</th>
<th>SIZE</th>
<th>PROF</th>
<th>TANG</th>
<th>GROW</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEV</td>
<td>0.44</td>
<td>0.42</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SIZE</td>
<td>8.71</td>
<td>1.14</td>
<td>0.241*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PROF</td>
<td>0.14</td>
<td>0.13</td>
<td>-0.141*</td>
<td>-0.134*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TAN</td>
<td>0.39</td>
<td>0.23</td>
<td>0.234*</td>
<td>0.273*</td>
<td>0.195*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GROW</td>
<td>1.12</td>
<td>0.31</td>
<td>0.007</td>
<td>0.006</td>
<td>0.457*</td>
<td>0.138*</td>
<td>-</td>
</tr>
</tbody>
</table>

*, ** and *** show significance at 10%, 5% and 1%, respectively

The correlation analysis does not highlight multicollinearity problems. Likewise, the use of further tests widely suggested by the literature highlight the absence of heteroskedasticity and autocorrelation.
4. RESULTS AND DISCUSSION

The results of the regression have been summarized in Table 3. As is evident, all the independent variables considered influence financial behaviour in a statistically significant way.

<table>
<thead>
<tr>
<th>Tab. 3 – Panel Fixed Effects Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanatory Variables</td>
</tr>
<tr>
<td>SIZE</td>
</tr>
<tr>
<td>PROF</td>
</tr>
<tr>
<td>TANG</td>
</tr>
<tr>
<td>GROW</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>R2</td>
</tr>
<tr>
<td>Adjusted R2</td>
</tr>
</tbody>
</table>

*, ** and *** show significance at 10%, 5% and 1%, respectively

The results confirm our first research hypothesis, suggesting that size positively and significantly affects debt.

Profitability has a negative relationship to debt, so our second research hypothesis is also confirmed.

Asset tangibility positively affects debt, confirming our third research hypothesis. Therefore, tangible assets represent an element of guarantee vis-à-vis creditors. This is of crucial importance in emerging economies, as creditors’ protection tends to be lower than in stronger economies.

Finally, the growth results are not statistically significant and therefore our fourth hypothesis must be rejected. The robustness analysis confirms our results, as shown in Table 4.

<table>
<thead>
<tr>
<th>Tab. 4 – Robustness check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanatory Variables</td>
</tr>
<tr>
<td>SIZE</td>
</tr>
<tr>
<td>PROF</td>
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<tr>
<td>TANG</td>
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<tr>
<td>GROW</td>
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<tr>
<td>Constant</td>
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<tr>
<td>R2</td>
</tr>
<tr>
<td>Adjusted R2</td>
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</tbody>
</table>

*, ** and *** show significance at 10%, 5% and 1%, respectively

5. CONCLUDING REMARKS

This paper analyzes the relationship between leverage and its main determinants, focusing on Chilean SMEs. The survey used the trade-off theory and the pecking order theory to explain the financial behaviour of the investigated companies. This approach is consistent with the prevailing literature which deems these theories more suitable for explaining the capital structure of SMEs. The companies were selected with a stratified sampling technique based on an economic criterion. Following this approach, we have identified a sample of companies that are sufficiently representative and varied in terms of turnover, number of employees and invested capital.

Overall, we surveyed 76 companies over a three-year period (2016-2018).

We used a static fixed effects (FE) model and also developed robustness control tests to verify the reliability of the model.

The results showed that the size and tangibility of the assets have a positive and significant influence on debt. Profitability showed a significant negative influence on financial leverage. Consequently, our first three research hypotheses (H1; H2 and H3) were confirmed by the results. Conversely, the growth showed an insignificant influence on the debt. Consequently, our fourth research hypothesis (H4) must be rejected.

The results of this work contribute to the literature on the financial behaviour of firms, providing empirical evidence in an economic context that has not yet been
studied. Furthermore, the results can support SME entrepreneurs in defining their financial policies.

REFERENCES