



Article

How Do Banking Characteristics Influence Companies' Debt Features and Performance during COVID-19? A Study of Portuguese Firms

Pedro Manuel Nogueira Reis * and António Pedro Soares Pinto

CISeD—Research Center in Digital Services, Polytechnic Institute of Viseu, 3504-510 Viseu, Portugal

* Correspondence: pedroreis@estv.ipv.pt

Abstract: This paper investigates how bank characteristics (market share, principal shareholders, profitability, and size), and the gender of the company's board members, along with their supervisory abilities, influence the firm's performance, cost of debt, and leverage. We extracted relevant data from a sample of nearly 18,300 Portuguese companies in 2020 (the pandemic year) to build our model with all the main explanatory variables; then, through the least absolute shrinkage and selection operator estimation, we reduced the variables. The robust ordinary least-squares standard-errors approach was applied by company size. Our findings allowed us to observe the crucial negative role of multiple bank relations, but only on the returns of small companies. A decrease in bank relations led to an increase in debt cost and reduced leverage across larger companies. Profitable banks generate higher company returns, mainly for small companies. Furthermore, the better-informed bank shareholders (management, institutional, or government) persuaded the banks to charge higher interest rates, resulting in a higher leverage ratio for companies of average size. Female board members tended to vote for lower debt ratios due to greater risk aversion, while the opposite was true of male board members. The supervisory capacity of the board in the area of bank relations showed a more substantial link with the increased financing costs of small companies. In brief, bank characteristics and board gender were strongly associated with the financial aggregates of companies relative to their size. This work contributes to the literature by using new bank characteristics and an original variable representing board ability to cope with bank relations. To the best of our knowledge, this is the first study to determine the association of the above characteristics in the Portuguese market relative to company size, and their impact on profitability, cost of debt, and leverage. The company board and banking systems should evaluate the impact of their decisions on corporate activity and make necessary adjustments.

Keywords: bank relationship; gender board members; financing constraints; ROA; leverage; debt cost

JEL Classification: G21; G32; G38



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1. Introduction

Difficulties in obtaining financing are one of the main problems for small businesses in the EU (Kwaak et al. 2017; Beck and Demirguc-Kunt 2006). These informationally more opaque companies are subject to more significant problems from adverse selections (risk ex-ante) and moral hazards (risk ex-post) and provide fewer guarantees (Pigini et al. 2016; Yoshino and Taghizadeh-Hesary 2018), which restricts their financing options to bank credit and commercial credit (Campello and Larrain 2016; Palacín-Sánchez et al. 2019). However, such companies dominate the business landscape and are the main drivers of employment, growth, and innovation in the European economy (Ferreira et al. 2016).

The chief characteristics of the banking sector with respect to market power are considered one of the main constraints on access to credit. The consensus of opinion

in the current literature on this topic has proved ambiguous (Wang et al. 2020a). On the one hand, Leon (2015) stated that banks with greater market power could reduce the supply of credit, while on the other hand, Álvarez and Bertin (2016) found that an increase in banking competition could also reduce the availability of credit to SMEs. The relationships that banking institutions establish with companies depend on multiple factors. Some are associated with certain aspects of the credit institution, while others reflect the particularities of the client company. In our opinion, an integrated analysis of these different elements constitutes an essential contribution towards helping to understand the complex relationships established between banks and companies. Our study complements and provides new approaches to the recent work by Wang et al. (2020a, 2020b) and Cantú et al. (2022), who identified a set of bank-specific characteristics (e.g., size, capitalization, risk) that influence the financing conditions of companies. In addition to the enumerated constraints, the literature has determined that gender discrimination also constitutes a significant constraint on access to credit, namely in terms of its cost and the rejection rate (Mascia and Rossi 2017).

Based on the literature review, we determined that most of the published works focused on large companies, and this led us to deepen the study of these issues by focusing on the universe of smaller companies, for which the collection of data is more complex. Taking into account the characteristics of these companies, we believe that an analysis by dimension provides an invaluable contribution to the research objectives, in line with previous studies (Palacín-Sánchez et al. 2019; Wang et al. 2020a, 2020b; Cowling et al. 2020). Considering the lack of studies in a Portuguese context, we also felt that this was a decisive impetus in carrying out this work.

Our study assesses the impact of banking sector characteristics (market share, branch/subsidiary, principal shareholders, profitability, size) and the gender of the company's board members on profitability, cost of debt, and corporate leverage. In addition to providing new empirical evidence, this investigation extends the existing literature in several ways. First, we assessed the effect of market power on business activity through market share and not market concentration, as this may be an inadequate measure of competition (Bolt and Humphrey 2015). Secondly, we incorporated a wide range of banking characteristics together with the gender issue of the company's board members, which guaranteed a richer and more systematic reading of the constraints that smaller companies face when they resort to credit. Furthermore, we introduced a variable related to a firm's bank relations supervisory board that was proven to have a strong association with the firm's fundamentals. The results indicated that banking characteristics such as shareholders, profitability, and number of bank relations interacted with administrators' gender and supervisory capacity to affect corporate profitability, debt cost, and leverage, with variations by company size. This empirical technique expanded upon previous investigations by applying a new approach to assess how the characteristics of the banking system and the board of directors were particularly influential in determining debt characteristics and firm performance.

The study includes a literature review, description of sampling and analytical methodology, results, and conclusions in addition to this introductory section.

2. Literature Review

The opportunity for access to financing at a reasonable cost is crucial for the survival and development of a company. SMEs rely heavily on bank credit, as they usually cannot access the capital market (Inklaar et al. 2015; Caglayan and Xu 2016). In addition, the obstacles they face in obtaining bank credit tend to worsen in times of financial difficulties, giving rise to credit rationing in terms of quantity, price, and maturity (Tayler and Zilberman 2016). In addition, these companies have lower productivity levels compared to larger ones (Ayyagari et al. 2014), limited credit history (Giné et al. 2012), and restrictions on credit lines to those with shorter maturities. They are required to provide more guarantees, support higher spreads (Chodorow-Reich et al. 2021), present high volatility in results (Bernini

and Montagnoli 2017), and their supervision and control are more expensive for financial institutions (Beck and De La Torre 2007).

Given the relatively negative characteristics of smaller companies, the banking system plays an essential role in their financing. Therefore, it is essential to understand how banks' market power conditions the efficiency of supervision and control. The literature on this topic has been somewhat ambiguous (Chemmanur et al. 2020) due to the different theoretical perspectives and sampling methods used (Wang et al. 2020b), and therefore, it has been challenging to reach a consensus on how market power conditions the availability of credit. On the one hand, researchers whose models incorporate the element of asymmetric information (Petersen and Rajan 1995) argue that greater competition in the credit market imposes restrictions on the ability of the company and the creditor to share equally in the intertemporal benefits of the relationship, allowing only the best to benefit from increased banking competition. In contrast, the symmetrical information modelers (Marquez 2002; Cetorelli and Peretto 2012) asserted that the increase in competition led to a better dispersion of information by potential creditors, reducing the supervisory and control capacity exercised by each one.

The literature has highlighted the need for banks to have some market power to invest in long-term relationships with their customers. In a concentrated banking market, the bank can, a posteriori, continue to enjoy negotiation power within its domain. Banks continue to have strong incentives to invest in the relationship in the competitive market due to the negotiation power that results from the endogenous connection established with the company (Garrido 2005). It is evident that the greater the number of banks that hold information on the company's credibility, the lower the value of that which is held by each one. Consequently, companies that maintain multilateral relationships do not incur a cost of 'hold-up' problems, but also do not enjoy the advantages provided by bilateral relationships (Nguyen and Tan 2019). Empirical studies do not allow for definitive conclusions on the impact of banking competition on business activity because contradictory effects coexist in this relationship. Increased competition can make access to credit more difficult (Zarutskie 2006; Bertrand et al. 2007), but it can also reduce some obstacles to financing through the banking system (Cetorelli 2004; Beck et al. 2004).

In addition to banks' market power, the depth of the relationship, measured by the number of transactions carried out, is another relevant issue (Bongini et al. 2015). If this number is large, it means that the bank exercises greater control over a company's activity, allowing for assessment of its ability to meet its commitments. A smaller distance between the creditor and the borrower facilitates the collection of soft information necessary to supervise and control the credit granted. A study by Agarwal et al. (2018) revealed that the number of borrowers who communicated personally with the bank increased significantly when the relationship was one of proximity. Alessandrini et al. (2010) also argued that the relationship that the company maintained with the bank's management was more relevant than physical proximity, because it permitted them to make better decisions. Therefore, it is essential to assess how banking characteristics affect performance, debt cost, and leverage.

In addition to the issues analyzed in the previous points, it is essential to assess the impact of the coronavirus disease 2019 (COVID-19), which has posed unavoidable challenges to corporate governance performance and practices. With the spread of COVID-19, companies and countries were forced to adjust their activity. Pourmansouri et al. (2022) evaluated the relationship between the behavior of significant shareholders and the performance of corporate governance in the period before and after the COVID-19 pandemic. The authors referred to the difficulty in changing the power of the main shareholder, which negatively affected the quality of board composition both before and during the COVID-19 pandemic.

Karbassi Yazdi et al. (2022) assessed the impact of COVID-19 on the banking system under the strong restrictive measures imposed by government authorities. The authors concluded that Iran's senior banks generated the most profit and were more resilient to the COVID-19 crisis. The performance of the banking system contributed to the creation of

new ways of providing services during the pandemic, allowing it to retain its employees, extend the useful life of loans, and avoid bankruptcy.

The literature review identifies the main characteristics that condition the banking relationship and establishes their relevance for assessing how they influence company performance, debt cost, and leverage.

2.1. Bank Relationship and Firm Performance

Based on a sample of Chinese companies, [Chemmanur et al. \(2020\)](#) reported that banking competition generated more excellent supervision in granting credit. They highlighted the greater sensitivity between bank credit and business performance in sectors with greater dependence on the banking system and less sensitivity in more developed regions from a financial point of view. They also declared that the sensitivity of business performance to bank credit increased with the rise in banking competition. In the opposite direction, [Bertrand et al. \(2007\)](#) found that after the deregulation of banking activity, the French banking system showed less appetite for recovering underperforming companies.

Banks collect useful private information throughout the banking relationship to evaluate future credit applications, reduce adverse selection, and monitor the borrower's performance. By collecting data on the relationship, a bank can check on the company's activity during periodic visits, advise the management team, evaluate financial statements, supervise contracts, and renegotiate the terms of loans, thus improving its performance ([Dennis and Mullineaux 2000](#)). By improving business performance in this way, the company in its relationship to the bank can lower its risk of bankruptcy ([Phelan 2017](#)). However, this improvement in the operational activity of borrowers at risk of default dissipates after two years of relationship ([Yildirim 2020](#)). Our review of the literature ([Carow et al. 2003](#); [Fraser et al. 2011](#)) also uncovered evidence that bank mergers can harm relationships established over time, and negatively affect the wealth created by the borrowing companies. Mergers in the banking system constitute an exogenous shock, interrupting the information flow between the bank and the company and reversing the benefits of bank credits generated by the banking relationship over time ([Yildirim 2020](#)).

Companies that have relationships with smaller, local banks have higher profitability, are less likely to default, and recover more quickly from financial difficulties ([Iwanicz-Drozdowska et al. 2018](#)). The authors presented four reasons why small banks provided a more efficient follow-up to smaller borrowers: (i) they were more likely to collect soft information, (ii) the exchange of information was intensified, (iii) the renegotiation of contracts became more accessible, and (iv) they were able to smooth out the contractual terms intertemporally (compensating for short-term losses with future returns). In consequence, we formulated the hypothesis:

Hypothesis 1 (H1): *Bank characteristics influence a company's performance.*

2.2. Bank Relationship and Firm Debt Cost

The credit restrictions to which companies are subject are analyzed essentially in terms of quantity; however, the effect of market power on the cost of credit continues to be poorly understood ([Wang et al. 2020a](#)). High financing costs lead to situations of underinvestment that can adversely affect business growth and development ([Vos et al. 2007](#)). [Wang et al. \(2020a\)](#) concluded that banks' market power reduced the cost of debt, particularly for the more informationally opaque ones. Based on the information hypothesis, the authors theorized that the banking system had strong incentives to invest in acquiring information and building stable relationships. Contrary to previous studies, [Rice and Strahan \(2010\)](#) maintained that high banking competition in a sample of small companies in the USA resulted in lower financing costs. In line with previous results, [Carroll and McCann \(2016\)](#) found that bank competition reduced the cost of credit. On the contrary, however, [Mascia and Rossi \(2017\)](#) concluded that SMEs active in more concentrated banking markets were subject to lower financing costs. Accordingly, we propose the following hypothesis:

Hypothesis 2 (H2): *Bank characteristics influence firm debt costs.***2.3. Bank Relationship and Firm Leverage**

Another stream in the literature sought to assess the impact of bank competition on business financing; however, its findings have proved to be ambiguous. Mudd (2013) and Love and Pería (2015) found evidence that banking competition improved SMEs' financing terms. However, studies carried out in China (Chong et al. 2013), Italy (Agostino and Trivieri 2010), the United Kingdom (Degryse et al. 2018), and the European Union (Wang et al. 2020a) showed that the market power of banks constituted an obstacle to the financing of small companies. In sharp contrast, Ratti et al. (2008) indicated that the increase in market power encouraged banks to acquire private information from borrowers, which reduced the financing restrictions for SMEs. Abubakr and Esposito (2012) in the UK and Tacneng (2014) in the Philippines confirmed the prevalence of the market power hypothesis, insofar as banking competition reduced the availability of credit to companies under conditions of information asymmetry. There are still authors (e.g., Cetorelli and Gambera 2001; Bonaccorsi di Patti and Dell'Araccia 2004) who believe that a nonlinear relationship exists between market power and SMEs' access to financing.

Zarutskie (2006) studied the impact of bank competition on access to bank credit. The author assessed the effect of banking deregulation in the US on business activity and concluded that young companies, subject to more significant information asymmetry, resorted less to bank credit, with increasing competition; however, this effect tended to diminish as companies matured. In the same vein, González and González (2008), in a study of European companies, concluded that corporate leverage increased with greater banking concentration and the guarantees given to creditors, but decreased with the protection of property rights. In turn, Beck et al. (2004) showed that greater banking competition reduced barriers to SMEs' access to bank credit, particularly in underdeveloped countries.

Large, well-capitalized banks with stable funding sources operating on a commercial banking business model grant larger volumes of credit. Banks with difficulty giving credit present higher risk, have sources of funding that are more volatile, and employ a universal bank business model (Cantú et al. 2022). Altunbas et al. (2009) stated that banks with low-risk indicators were less exposed to changes in monetary policy in regard to lending, as they had better access to financial resources. Along the same lines, Kashyap and Stein (2000) found that changes in monetary policy more strongly affected the ability of smaller and less liquid banks to grant credit.

Considering the specific characteristics of banks, Bolton et al. (2016) and Jiménez et al. (2017) determined that the reserves accumulated in periods of economic expansion helped to mitigate the negative effects of a crisis in periods of recession, ensuring protection for customers. From another perspective, banks with a greater number of subsidiaries were less sensitive to funding shocks in the lending arena (Cetorelli and Goldberg 2016). In turn, Sukmana et al. (2020) concluded that small Indonesian banks were inefficient in terms of their intermediation role, as they were unable to optimally channel their resources to companies. Brei et al. (2020) noted that when banks granted a larger volume of small loans, the volatility and risk exposure of the portfolio decreased together with the risk of contagion among borrowers. Morgan and Pontines (2018) showed that providing a greater volume of credit for SMEs promoted financial stability, reducing the number of bad debts and the risk of bankruptcy among financial institutions. Ahamed and Mallick (2019) reported that a higher level of financial inclusion provided stability in the banking system. One opposite view asserted that an increase in access to banking services could lead to unsustainable volumes of credit that would weaken the financial system (Sarma and Pais 2011; Mehrotra and Yetman 2015). A large expansion in the number of borrowers reduced the level of banking supervision, putting some institutions at greater risk and potentially increasing systemic risk. Evidence from some studies (e.g., De Bodt et al. 2005; Cenni et al. 2015) also showed an increase in the availability of bank financing as the number of banks with which a company dealt decreased. Along the same lines, Cotugno et al. (2013) proved

that companies that had credit relationships with only a few banks were less subject to credit rationing.

In turn, creditor trust in SME managers positively increased the likelihood that a company's financing would be approved (Moro and Fink 2013). In addition, Trönberg and Hemlin (2014) reported that credit decisions were more difficult to make when only supported by subjective evaluations based on little information. Good decisions resulted from hard, quantitative, and easily transferable information. Another stream in the literature assessed the issue of restrictions on financing according to the size of the bank. In this line, Beck et al. (2011) claimed that small banks had comparative advantages over larger banks, through reduced credit restrictions on SMEs. This positive impact became more relevant for young, small, non-exporting companies with difficulty in providing guarantees. Canales and Nanda (2012) concluded that Mexican SMEs succeeded in obtaining a greater volume of credit from decentralized banks. Hasan et al. (2017) showed that the robust implementation of local banks in Poland improved access to bank financing, reduced costs, increased investments, and favored the growth of SMEs. Berger et al. (2017) reported that despite technological changes, small banks still had comparative advantages in relieving the financial constraints of SMEs. However, Jagtiani et al. (2016) questioned the reputation of small local banks, especially when subject to merger processes, as privileged interlocutors with SMEs. The authors claimed that, after the acquisition of local banks by large banks, the amount of credit granted to SMEs improved significantly. As per the literature review, we established the following hypothesis:

Hypothesis 3 (H3): *Bank characteristics influence firm leverage.*

2.4. Impact of Board Member Gender on Firm Profitability, Cost of Debt, and Corporate Leverage

In addition to the characteristics of the bank relationship, the gender of the company board members assumes an increasing relevance within the scope of corporate activity. In Europe, women constitute about 25% of business owners and 30% of self-employed workers (Deloitte 2016). They are more likely to own younger companies centered in marginal activity sectors with lower performance (Carter et al. 2015). Speelman et al. (2013) concluded that gender and risk aversion were determining factors in explaining women's choice of lower-risk investments. Risk aversion is also reflected in a greater reluctance to taking on debt (Huang and Kisgen 2013; Carter et al. 2015).

Researchers (Khan and Vieito 2013; Liu et al. 2014; Perryman et al. 2016) have evinced a growing interest in assessing the impacts of gender of management bodies on profitability. However, there is no integrative theory capable of explaining the role that gender diversity in management plays in the complex field of corporate finance. The make-up of the management body in terms of balance between men and women is an essential feature in performance prediction. Agnew et al. (2003) concluded that women were more risk-averse than men; however, there is growing evidence that the experiences, knowledge, and values governing women's decisions are significant determining factors (Post and Byron 2015). The literature also emphasizes that female directors are more likely to improve corporate governance (Adams and Ferreira 2009), are more aware than men (Schmitt et al. 2008), more responsible (Fondas 2000), less confident (Daily and Dalton 2003), make management more independent (Lucas-Pérez et al. 2015), reduce agency costs (Reguera-Alvarado et al. 2017) and make investment decisions that entail lower risk (Faccio et al. 2016). In light of agency theory, gender balance contributes significantly to improving the decision-making process and, consequently, business performance (Carter et al. 2010).

Kilincarslan et al. (2020) discussed the relatively small number of empirical studies on the influence of gender diversity of management bodies on indebtedness. From an analytical point of view, the authors concluded that management bodies with greater gender diversity tended to accumulate less debt. Faccio et al. (2016) also emphasized that entities managed by female CEOs had lower levels of leverage compared to their male CEO counterparts. The difficulties in accessing bank credit may be even more substantial

for companies led by women (Razavi 2012). In these circumstances, women are more conservative in applying for credit (Coleman and Robb 2009; Moro et al. 2017) as they tend to be more risk-averse and less confident than men (Croson and Gneezy 2009; Huang and Kisgen 2013), less prone to indebtedness (Carter et al. 2015), and more cautious in selecting funding sources (Barber and Odean 2001). Empirical evidence showed that women resorted to credit less often (Fairlie and Robb 2009; Lemma et al. 2022) in spite of being subject to more liquidity constraints (Rybczynski 2015). Handaragama and Kusakabe (2021) reported that women faced more significant challenges in accessing financial resources, as more participation in management bodies occurred in low-level positions. For example, Coleman (2000) and Alesina et al. (2013) noted that lenders charged higher interest rates to female-led companies. On the contrary, Asiedu et al. (2012) and Francis et al. (2013) demonstrated that companies led by women benefited from lower costs in accessing bank credit because they were more likely to provide reliable accounting information and were less likely to default. However, Cavalluzzo et al. (2002) and Bellucci et al. (2010) did not find any differences between female- and male-led companies. Thus, it has been challenging to achieve consensus in the literature regarding the credit refusal rate for women-led companies. Cavalluzzo et al. (2002) highlighted the greater difficulty of female CEOs in accessing credit, and Cavalluzzo and Cavalluzzo (1998) and Moro et al. (2017) reported similar conclusions.

In a study carried out on Italian companies, Bellucci et al. (2010) noted that female-owned companies were penalized compared to male-owned companies regarding guarantees provided and availability of credit. Mascia and Rossi (2017) showed that companies led by women were subjected to higher bank financing costs. The authors also mentioned that changing leadership from women to men reduced interest rates. The data suggested that banks awarded a premium to companies controlled by men, supporting the idea of continuing gender discrimination in the banking system and the business sector. Mascia and Rossi (2017) advanced two possible explanations. Firstly, they argued that creditors saw women as having inferior capacity to manage a business, prompting them to assign more stringent credit conditions (Alesina et al. 2013). Secondly, women were more likely to incur higher financing costs because of their lower bargaining power with the male-dominated banking system (Croson and Gneezy 2009).

Gender assignments were also a powerful signaling device for potential investors (Eddleston et al. 2016). Alsos and Ljunggren (2017) reported that in investment projects, women are more likely to adopt “compensation strategies” such as involving more men in the team to overcome perceived deficits associated with their gender. These negative connotations were more evident in periods of turbulence and uncertainty, leading creditors to impose more restrictive conditions to overcome the alleged risks associated with female management.

From the above discussion, we established the following hypotheses:

Hypothesis 4a (H4a): *The gender of the company's board members influences the company's performance.*

Hypothesis 4b (H4b): *The gender of the company's board members influences the company's deb costs.*

Hypothesis 4c (H4c): *The gender of the company's board members influences the company's leverage.*

2.5. Effect of Size on a Firm's Fundamentals

Company size is essential to determine a company's profitability, with different studies investigating the relationship between company size and profitability (Yadav et al. 2021). Results were mixed, with some researchers finding a negative relationship (Banchuenvijit and Puong 2012) or a positive correlation (Doğan 2013; Olokoyo 2013), while others saw no

significant correlation (Whittington 1980). Firm size was also a factor that affected the cost of debt (Utami 2021). The greater a company's assets, the greater the lender's confidence in lending to the company because the company has more asset guarantees at the maturity of the loan (Nurdiniah and Munandar 2020). Assets can be used as collateral by creditors. Magnanelli and Izzo (2017) also stated that a firm's size made it easier for the company to obtain loans and decreased the cost of debt imposed by creditors.

3. Sampling and Methodology

This paper focused on a number of bank characteristics such as market share on the Portuguese market, profits, size, and bank shareholders' attitudes towards some companies' fundamentals such as ROA, financing costs, and debt structure. This was considered a legitimate method, as Cantú et al. (2022) and Wang et al. (2020a) also studied a similar set of bank characteristics. In addition, we added to our study the number of banks in the companies' relationships, the company size, the boards' supervisory ability, and the gender of the companies' board members to determine their association with fundamentals. The scope of the work was restricted to Portugal and was designed as a cross-section paper with data only available for 2020, the pandemic year.

3.1. Samples and Variables

The database used contained relevant data from the SABI (Iberian Balance Sheet Analysis System) for Portuguese companies in the year 2020 (cross section) with turnover of >EUR 1 million (18,300 companies). Companies from the financial sector were excluded, and the scope of analysis only covered commercial, industrial, and service enterprises listed as limited liability corporations, which in Portugal are called sociedades anónimas or sociedades por quotas. We collected a group of fundamentals from the selected companies, comprising raw variables (Tables 1 and 2) that allowed us to compute the final constructs according to Table 3. These included employees (employee number), assets, turnover, interest rate on the debt, the ROA, and the debt. Furthermore, we sought to show the diversity in bank relations by including the number of banks each company dealt with and the name of each bank that a company had a relationship with to generate a profile of the banking characteristics.

Table 1. Bank market share score per company.

| Bank | N°. of Companies Working with Each Bank | Market Share Rank |
|--------|---|-------------------|
| Bank D | 10,129 | 1 |
| Bank F | 7036 | 2 |
| Bank O | 6559 | 3 |
| Bank C | 6032 | 4 |
| Bank L | 5863 | 5 |
| Bank K | 2026 | 6 |
| Bank J | 1880 | 7 |
| Bank A | 1717 | 8 |
| Bank G | 976 | 9 |
| Bank H | 152 | 10 |

Table 1. *Cont.*

| Bank | N°. of Companies Working with Each Bank | Market Share Rank |
|------------------------------------|---|-------------------|
| Bank I | 118 | 11 |
| Bank M | 50 | 12 |
| Bank N | 45 | 13 |
| Bank B | 25 | 14 |
| Bank E | 11 | 15 |
| Total working relations with banks | 42,619 | |

Notes: Bank market share score per company runs from 1 for the most disseminated bank among Portuguese companies to 15 as the least popular bank among Portuguese companies. Source of data was SABI, and data were treated with Stata.

Table 2. Variables associated with bank characteristics.

| Banks (2020 Data) | Shareholder Score (Share Capital × Shareholder Type (0–4)) | Branch = 0 Subsidiary = 1 | Bank Market Share | Total Assets (th.EUR) | Profitability |
|-------------------|--|---------------------------|-------------------|-----------------------|---------------|
| Bank A | 2.6 | 1 | 8 | 7,257,808 | −0.90% |
| Bank B | 1.8672 | 0 | 14 | 736,176,000 | 0.36% |
| Bank C | 1 | 1 | 4 | 37,629,889 | 2.82% |
| Bank D | 1.107 | 1 | 1 | 63,965,493 | 0.85% |
| Bank E | 2 | 1 | 15 | 30,703 | −7.68% |
| Bank F | 0.5277 | 1 | 2 | 57,448,833 | 6.90% |
| Bank G | 2 | 1 | 9 | - | −100.00% |
| Bank H | 1.07 | 0 | 10 | 93,230,295 | 0.22% |
| Bank I | 0.5376 | 0 | 11 | 2,488,491,000 | 0.27% |
| Bank J | 1 | 1 | 7 | 13,463,852 | 7.30% |
| Bank K | 3 | 1 | 6 | 17,941,000 | −0.45% |
| Bank L | 2 | 1 | 5 | 85,451,613 | 5.21% |
| Bank M | 0.68133 | 0 | 12 | 1,325,259,000 | 0.04% |
| Bank N | 1.14382325 | 1 | 13 | 584,446 | 6.43% |
| Bank O | 1.25 | 1 | 3 | 44,042,448 | −49.92% |

Notes: Shareholder score is obtained for each shareholder type: individual, company, government, institutional, and management. A level of 0 to 4 is attributed to each category, and then multiplied by the share capital percentage of each type of shareholder = $\sum [\text{rank} \times \text{share capital}\%]$. This is the variable BankShareholder, listed in Table 3. If a company has a relationship with Bank A and Bank B, the bank shareholder score is $(2.6 + 1.8672)/2$ (banks) ≈ 2.23 . Although improbable given the different percentage points of each shareholder and the possible outcomes of bank combination in a single company, this ratio can take the same value for different shareholders' configurations. For example, a ratio of 2.55 or a ratio of 2.75, regardless of the configuration, will always mean that a 2.75 ratio clearly indicates the presence of more sophisticated and informed bank shareholders in the relationships that a single company has with several banks. Bank market share score indicates the dissemination of the bank among Portuguese companies. Using the previous example, if a company works with Bank A and Bank B, this yields a bank market share score of $(8 + 14)/2 = 11$, and the same for rest of the bank characteristics. The data were sourced from SABI and evaluated with Stata.

Table 3. Descriptive statistics, variables, and measures.

| Panel 1 Dependent variables. | | | | | | | | |
|--|-----------------|---|---|--------|------------|------------------------|-----------|-----------|
| Type | Variable | Meaning | Measure | N | Mean | Min | Max | p95 |
| Dependent Variable | ROA | Return on assets from companies in 2020 | Companies' return | 18,235 | 5.682902 | −460.12 | 416.127 | 22.802 |
| Dependent Variable | loginterest | Average interest rate borne by companies in 2020, log-transformed | Debt cost | 15,798 | −5.671569 | −21.72283 | 1.093129 | −3.728048 |
| Dependent Variable | debt_assets | Debt over assets | Debt gearing, leverage ratio | 18,235 | 0.5452176 | 9.83×10^{-16} | 23.34649 | 0.9245492 |
| Panel 2. Regressors: companies' variables | | | | | | | | |
| Type | Variable | Meaning | Measure | N | Mean | Min | Max | p95 |
| Regressor | GenF | N. of female board members | N° of female board members | 18,251 | 1.274177 | 0 | 89 | 4 |
| Regressor | GenM | N° of male board members | N° of male board members | 18,251 | 3.422826 | 0 | 84 | 9 |
| Regressor | logbanks | N° of banks, log-transformed; bank characteristics | Bank relation diversity | 18,251 | 0.6973607 | 0 | 2.302585 | 1.609438 |
| Regressor | banks_director | N° of banks per board manager | Commercial capacity and negotiation ability | 18,251 | 0.6483294 | 0.0089286 | 4 | 1.333333 |
| Regressor—control variable | logturnover | 2020 turnover (1000s of EUR), log-transformed | Size of companies—CONTROL VARIABLE | 18,235 | 8.218509 | 6.907816 | 15.68613 | 10.52459 |
| Panel 3. Regressors: bank characteristics | | | | | | | | |
| Type | Variable | Meaning | Measure | N | Mean | Min | Max | p95 |
| Regressor—bank characteristics | BankShare | Scoring of bank share averaged per no. of banks for each company (score/no. of banks; bank characteristics) | Bank presence; Strength in the market (share). The most frequent bank in Portuguese companies has a score of 1, while the least is 15 divided by the number of banks with which each company works. | 18,251 | 3.395376 | 1 | 15 | 6.25 |
| Regressor—bank characteristics | BankShareholder | Banks' principal shareholders (score, bank characteristics, divided by the number of banks with which each company works) | Score that weighs the range from the least to the best-informed shareholders (individuals 0, companies 1, government 2, institutional investors 3, and management 4) times each share's capital percentage. Afterwards, this is divided by the number of banks each company works with. | 18,251 | 1.282747 | 0.5277 | 3 | 2 |
| Regressor—bank characteristics | BankProfit | Banks' profit/loss (2020) divided by the number of banks each company works with (score, bank characteristics) | Bank ROA | 18,251 | −0.0685831 | −1 | 0.0729941 | 0.0689644 |
| Regressor—bank characteristics | logbanksize | 2020 assets (1000s of EUR), log-transformed; bank characteristics | Size of banks | 18,177 | 17.72711 | 0.4922912 | 10.33212 | 21.63494 |
| Regressor—bank characteristics | Branch0Subs1 | If a bank has a subsidiary or a branch in Portugal (0 or 1, bank characteristics) | Allocation of limited assets or allocation of full mother company balance sheet (more branches mean less interest in the country of origin of the bank) | 18,251 | 2.316257 | 0 | 10 | 5 |

Table 3. Cont.

| Panel 4. Segment and supporting variables | | | | | | | | |
|---|---------------|--|---|--------|-----------|----------|-----------|-----------|
| Type | Variable | Meaning | Measure | N | Mean | Min | Max | p95 |
| Group variables | Big | Big companies—size category according to Portuguese Decree-Law N°. 372/2007 | If [Employees \geq 250 \vee (Turnover > EUR 50 mil \wedge Assets > EUR 43 mil)] | 1356 | 1 | 1 | 1 | 1 |
| Companies' group sizes | Micro | Microcompanies are a size category according to Portuguese Decree-Law N°. 372/2007 | If [Employees < 10 \wedge (Turnover < EUR 2 mil \vee Assets < EUR 2 mil)] | 7486 | 1 | 1 | 1 | 1 |
| Companies' group sizes | Small | Small companies—Size category according to Portuguese Decree-Law N°. 372/2007 | If [Employees < 50 \wedge (Turnover < EUR 10 mil \vee Assets < EUR 10 mil)] | 7894 | 1 | 1 | 1 | 1 |
| Companies' group sizes | Average | Average companies—Size category according to Portuguese Decree-Law N°. 372/2007 | If [Employees < 250 \wedge (Turnover < EUR 50 mil \vee Assets < EUR 43 mil)] | 1681 | 1 | 1 | 1 | 1 |
| Supporting variable | Interest rate | Interest rate | Average interest rate supported by companies (needed to compute debt cost) | 18,251 | 0.007612 | 0 | 2.9 | 0.0229 |
| Supporting variable | Employees | Number of employees in 2020 | Variables needed to calculate companies' size degrees—MEDIATING VARIABLE | 18,235 | 71.73809 | 1 | 26,327 | 205 |
| Supporting variable | Assets | Company assets in 2020 (1000s of EUR) | Variables needed to calculate companies' size degrees—MEDIATING VARIABLE | 18,235 | 16,580.23 | 7.15403 | 6,557,136 | 41,699.04 |
| Supporting variable | Turnover | Turnover in 2020 (1000s of EUR) | Variables needed to calculate companies' size degrees—MEDIATING VARIABLE | 18,235 | 11,997.64 | 1000.061 | 6,492,301 | 37,219.52 |

Notes: If the interest rate is 0 it means that a company has no debt cost; a 0 interest rate can also apply to a debt bearing no interest, as in the case of grants from the European Union to financial institutions. A minimum value of 0 for board members may apply to males or females. If a board lists no male members, then it must have at least one female board member. The opposite is also true. Microcompanies are ones with fewer than ten employees and who do not exceed any of the other restrictions (e.g., less than EUR 2 million in turnover or assets). Small companies have fewer than 50 employees and less than EUR 10 million in turnover or assets. Average-sized companies have fewer than 250 employees and less than EUR 50 million in turnover or less than EUR 43 million in assets. Big companies have more than 250 employees, more than EUR 50 million in turnover, and EUR 43 million in assets. The variables, number of banks, interest rate, and turnover were log-transformed because of their variability. The log-transformation method has long been used for estimations, as it makes skewed data more normal, improves linearity between variables, and refines statistical analyses. Keene (1995) recommended that log-transformed analyses be used in preference to nontransformed analyses. Data were sourced from SABI and evaluated with Stata.

The dependent variables were the ROA, the interest rate (*loginterest*) supported by the financial debt of the company, and the debt over the assets as the leverage ratio (*debt_assets*). We used assets, turnover, and number of employees to calculate the group sizes of the different companies as expressed in the Portuguese Decree-Law No. 372/2007. The turnover was log-transformed to use as a control for company size (*logturnover*). A number of banks were subjected to log transformation, and we built a new variable measuring the supervising ability obtained dividing the banks' daily relations (*banks_director*) over the number of board members of the companies. The numbers of male and female board members constituted two additional regressors for the dependent variables, *GenF* and *GenM*. For further information about the construction of the variables, see Table 3 in this subsection and Expression 1 for the full model to be estimated in the subsection of Methods.

Knowing the bank name, and using the bank's annual reports regarding the year 2020, we created several variables concerning bank characteristics: (i) bank share in the Portuguese companies as shown in Tables 1 and 2 (*BankShare*), reflecting the strength of the bank's presence in Portuguese companies; (ii) the log of the banks' assets (*logbanksize*), a measure of the size and the power of the banks associated with a certain company (Tables 2 and 3); (iii) the banks' net profit margins on assets (*BankProfit*) demonstrating their effectiveness in supplying credit; (iv) the banks' shareholder type (*BankShareholder*) measured by their type of shareholders from a scale of noninformed to most informed (Table 3); and (v) the branches or subsidiaries where the banks conducted their activities in Portugal, (*Branch0Subs1*), which mirrored the banks' confidence in the Portuguese market. The presence of a branch showed that a bank allocated a portion of its mother company's balance sheet to providing financial ratios to perform operations in Portugal, and subsidiaries directly allocated funds for its activity. For further information about the construction of the variables, see Tables 1–3.

Table 2 shows the banks' characteristics, shareholder scores, branch or subsidiary scores, market share scores, assets size, and banks' net return on assets. A high score on shareholders indicates that they are more informed about the bank's business and that this translates into reduced agency costs. Concerning branches and subsidiaries, a branch means less exposure and asset allocation by the banks in the Portuguese market. A bank market share ranking of 1 means that that bank has the highest possible presence in the sample of Portuguese companies, while 15 is the least represented. Asset size equates to a bank's dimension and indicates degree of power with more company relationships; bank returns reflect a bank's effectiveness in managing its assets well. If a company works with bank A and bank B, the two together will produce a sum of each individual bank's inputs and divided by 2 presents the final ratio. Please see Table 2 footnote for a more detailed explanation.

In Table 3, the descriptive statistics show that there were more men than women on companies' boards of directors; the companies' ROA average was 5.6%, the number of employees 71, and 95% of all companies had fewer than 205 employees. In FY2020, the companies' assets averaged EUR 16,580.23, and turnover was EUR 11,997.64. The debt gearing was 54% on average, and large companies numbered 1356, micro 7486, small 7894, and average-sized 1681, showing the predominance of micro- and small companies in Portugal. We also used the log-transformed number of banks in 2020 to represent the bank relation diversity and the number of banks per board manager (mean = 0.64), indicating the company's commercial capacity and negotiation ability. The average number of bank relationships per company was 2.33, indicating that banking diversity was uncommon in Portuguese companies. Regarding bank characteristics, *BankShare* by company reached an average score of 3.4, which means that companies worked mainly with banks whose market power was stronger. The *BankShareholder* mean was 1.3, implying that an average company had relations with banks having relatively well-informed shareholders. Considering *BankProfit*, our database revealed an incidence of company relations mainly with banks with negative returns (−6.8% loss).

3.1.1. Methods

Our linear function estimates the regressors for the dependent variables, ROA, debt-to-assets, and log interest rate by company size.

$$y_i^a = \beta_0^a + \sum_{j=1}^p \beta_j^a \cdot x_{ij}^a \tag{1}$$

With y being the dependent variable for each observation i (company), a is the type of dependent variable, β is the coefficient, x is the regressor (as described in Table 3), and j is the number of independent variables.

Given the high number of predictors and the number of variables included in the model, standard regression methods tended to overfit the data and also overestimated the optimism bias (Ranstam and Cook 2018). LASSO (least absolute shrinkage and selection operator) regression (Townsend 2018) works as a reduction and variable assortment method for regression models to solve these two problems. Using Lasso regression tends to minimize prediction errors by summing the values of the predicted coefficients on the function to be minimized, allowing Lasso to transform the coefficients of superfluous variables to zero, and select regressors more efficiently. With $\lambda = 0$, there is no correction of overfitting (Friedman et al. 2001, 2010).

$$MIN \left\{ \frac{1}{n} \sum_{i=1}^N (y_i^a - \beta_0^a - \sum_{j=1}^p \beta_j^a \cdot x_{ij}^a)^2 \right\} + \lambda \sum_{j=1}^p |\beta_j^a| \tag{2}$$

This work applied three Lasso regressions, one for each dependent variable, and as an identical result, the variable Branch0Subs1 overfitted the models and thus was excluded from the estimations. Next, we proceeded with the OLS estimation according to expression (1) but carried out the test of heteroscedasticity and potentially the serial correlation throughout the cluster-robust standard-errors model according to Arellano (1987). Hair et al. (1995) calculated that the maximum acceptable level of VIF was 10. A VIF value > 10 was a clear signal of multicollinearity. Although certain independent variables showed a significant correlation < 50%, when inserted in the model along other variables, the multicollinearity effect was absent. Furthermore, the robust standard errors made the confidence intervals more assertive (Lindner et al. 2020).

We also estimated the model according to the four sizes of companies (Table 3).

3.1.2. Results

Table 4 shows the three dependent variables calculated according to expression (1).

Table 4. Results of determination of ROA (performance), cost of debt, and debt-to-assets (leverage) for all companies.

| | ROA | Loginterest | Debt_Assets |
|----------------|------------|-------------|--------------|
| logbanks | −2.280 *** | 0.169 *** | −0.0431 *** |
| | [−8.34] | [3.55] | [−4.76] |
| banks_director | 1.800 *** | 0.302 *** | 0.0637 *** |
| | [4.34] | [4.22] | [4.61] |
| Gen-F | −0.0870 | −0.00906 | −0.00760 *** |
| | [−1.08] | [−0.59] | [−4.45] |
| Gen-M | −0.331 *** | 0.0386 *** | 0.00602 *** |
| | [−5.55] | [4.19] | [4.14] |

Table 4. *Cont.*

| | ROA | Loginterest | Debt_Assets |
|--------------------|------------|--------------------|--------------------|
| BankShare | 0.106 | 0.00675 | −0.00228 |
| | [1.27] | [0.47] | [−0.88] |
| BankShareholder | −0.336 | 0.110 * | 0.0160 * |
| | [−1.25] | [2.28] | [2.31] |
| BankProfit | 1.852 ** | −0.118 | −0.102 ** |
| | [2.77] | [−1.07] | [−3.07] |
| logturnover | 1.464 *** | −0.0613 *** | 0.0209 *** |
| | [13.21] | [−3.35] | [6.42] |
| logbanksize | −0.565 ** | −0.0764 + | 0.00659 |
| | [−2.87] | [−1.91] | [1.03] |
| Constant | 5.537 | −4.427 *** | 0.216 + |
| | [1.52] | [−6.07] | [1.88] |
| Observations | 18,161 | 15,738 | 18,161 |
| R-squared | 0.019 | 0.011 | 0.006 |
| Adjusted R-squared | 0.019 | 0.011 | 0.006 |
| Mean VIF | 1.61 | 1.64 | 1.61 |
| Highest VIF | 2.32 | 2.30 | 2.32 |

Notes: The t statistics are in brackets; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; no multicollinearity as per VIF analysis. Bank characteristics variables are underlined, company board member's gender and bank negotiating capacity are italic, and control variable is bold. Data were sourced from SABE and evaluated with Stata.

The Pearson correlation coefficient, a nonparametric approach that does not assume normality, was used to assess the monotonic association between two continuous or ordinal variables. This method is necessary for variables that do not follow a normal distribution (Hauke and Kossowski 2011).

3.2. Performance (ROA)

An increase in the number of banks per company negatively affected ROA, suggesting that a closer banking relationship was associated with greater profitability. This negative effect of the number of banks on profitability was supported by the argument frequently highlighted in the literature that the intensification of the relationship allows for greater mutual understanding, contributing to a reduction in information asymmetry. Maintaining the banking relationship in a small number of entities reduces adverse selection and the risk of moral hazards. However, Chemmanur et al. (2020) came to the opposite conclusion in a study carried out with a sample of Chinese companies. They report that the effect of bank credit on productivity and business performance improved with the increasing number of bank relationships. It appeared that multiple bank connections were associated with or a symptom of the operational malfunctioning of a company. Lower returns might have been due to higher bank commissions, less bank commitment to support management, or they might indicate potential failures in management where multiple sources of money were needed to support a company's weak financial situation.

We can also evaluate the advantages and disadvantages of relationship loans in terms of the information monopoly and the state of financial difficulty of a company. Our results support a hold-up problem that stems from the monopoly of information generated during a company–bank relationship. This problem was discussed by Iwanicz-Drozdowska et al. (2018), but their conclusions contradicted Farinha and Santos (2002) when they stated that the duration of the relationship and the company's growth opportunities increased when the company established relationships with several banks.

Bank share did not seem to have any impact on companies' ROA, however. It is still not proven that companies' relations with banks with the highest market share enjoyed the banks' best information of Portuguese companies' weaknesses and strengths, allowing them to determine the company's needs and helping them to generate profitability through better service or products. According to Beck et al. (2011), small banks reduced credit restrictions for small businesses. In our case, smaller banks increased performance through closer relationships with companies. Iwanicz-Drozdowska et al. (2018) also mentioned that small companies working with local banks showed better performance, a lower probability of default, and faster recovery from financial difficulties. Bragoli et al. (2022) also reported that the geographic proximity between banks and borrowers enhanced firms' returns on assets (ROAs).

Banks in Portugal with the best-informed shareholders (management shareholders and institutional investors) showed no association with companies' returns. Nevertheless, banks with a higher shareholder score may have achieved more concentrated capital and less dispersal (probably not listed). In our sample, many institutionalized banks with low free-float were less profitable (Table 5). Banks with share capital that was not concentrated and listed had a higher degree of demand for profits, which may have increased the bank's efficiency and the cost-to-income ratio, favoring companies' returns through lower financing costs. The most profitable banks that work with companies positively influence the companies' returns, passing on the value of their greater efficiency to companies by providing money at a lower interest rate and rendering high-value services such as consulting and advisory meetings. Banks have developed a scalable knowledge approach towards companies, enabling them to create a comprehensive database with more reliable risk reduction. The monopolistic power acquired by the relationship bank allows it to extract additional income and create incentives to preserve long-term relationships, improve business performance, and lower the risk of bankruptcy (Phelan 2017). The principal relationship bank conditions the borrower's performance by the close supervision and control it exercises; if the loan channel is interrupted, the positive impact of the relationship is reversed (Yildirim 2020). Increased bank size was associated with increased bank profits (Table 5).

In conclusion, bigger banks were more likely to be associated with greater company profitability, most likely because of their greater knowledge and experience, lower finance costs, and more aggressive advisory services. A giant board with a preponderance of men as directors leads to lower returns, and a higher bank-per-director ratio is conducive to better company efficiency. If we examine the situation in terms of number of banks per director, we conclude that too many banks create more entropy and are associated with worse returns. A higher ratio of banks per director could be due to the inefficiency inherent in a large board. The banks-per-director ratio reflects the board's ability to handle the complex management decisions involved in financing. An overly manned board disperses decisions, lowers decision-making time, and suffers from increased expenses. The control variable has an expected significant positive value with company returns. We validated Hypothesis 1 (H1) by showing that bank characteristics influenced company performance.

We also observed that the number of male board members negatively affected performance. In this way, we validated Hypothesis 4a (H4a), which stated that the gender of the company's board members influenced the company's performance.

Table 5. Pearson correlation matrix.

| | ROA | Logint~t | Debt_a~s | Logbanks | Banks_~r | GenF | GenM | BankShare | BankShareholder | BankProfit | Logturnover | Logbanksize |
|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------------|------------|-------------|-------------|
| ROA | 1.0000 | | | | | | | | | | | |
| loginterest | −0.0905 * | 1.0000 | | | | | | | | | | |
| debt_assets | −0.2055 * | 0.1311 * | 1.0000 | | | | | | | | | |
| logbanks | −0.0618 * | 0.0806 * | −0.0056 | 1.0000 | | | | | | | | |
| banks_dire~r | 0.0172 * | 0.0691 * | 0.0094 | 0.4654 * | 1.0000 | | | | | | | |
| GenF | −0.0452 * | −0.0018 | −0.0218 * | 0.1369 * | −0.3104 * | 1.0000 | | | | | | |
| GenM | −0.0701 * | 0.0210 * | 0.0206 * | 0.2545 * | −0.4275 * | 0.4581 * | 1.0000 | | | | | |
| BankShare | 0.0064 | 0.0363 * | −0.0019 | 0.1244 * | 0.1264 * | −0.0149 * | −0.0266 * | 1.0000 | | | | |
| BankShareholder | −0.0077 | 0.0403 * | 0.0105 | 0.0862 * | 0.0926 * | −0.0161 * | −0.0202 * | 0.5678 * | 1.0000 | | | |
| BankProfit | 0.0234 * | −0.0126 | −0.0356 * | −0.0436 * | 0.0134 | −0.0163 * | −0.0565 * | −0.1088 * | −0.1177 * | 1.0000 | | |
| logturnover | 0.0448 * | −0.0120 | 0.0441 * | 0.2448 * | −0.2383 * | 0.2591 * | 0.4946 * | −0.0176 * | −0.0423 * | −0.0443 * | 1.0000 | |
| logbanksize | −0.0098 | −0.0316 * | 0.0156 * | −0.0250 * | −0.0635 * | 0.0261 * | 0.0574 * | 0.1720 * | −0.1115 * | 0.0600 * | 0.1129 * | 1.0000 |

Note: * means significant at $p < 0.05$. Data were sourced from SABI and evaluated with Stata.

3.3. Cost of Debt

Larger banks are linked to lower interest-bearing rates for companies due to the banks' ability to lend money at discounted rates, which is in line with [Mascia and Rossi \(2017\)](#), who showed that banks with a more institutionalized shareholder structure had higher debt costs. The results do not validate the conclusions of [Hasan et al. \(2017\)](#) that the high implementation of local banks in Poland reduced financial costs, improved access to bank financing, increased investments, and favored the growth of small companies. In the same sense, [Wang et al. \(2020a\)](#) showed that bank market power reduced the cost of debt for smaller companies. In turn, [Rice and Strahan \(2010\)](#) and [Carroll and McCann \(2016\)](#) found that increased bank competition provided lower financing costs. In addition, the increase in competition resulting from the deregulation of bank branches increased the rate of incorporation of new businesses ([Black and Strahan 2002](#)), by providing small companies access to bank loans at lower interest rates ([Rice and Strahan 2010](#)). Lenders with low market power were likelier to lower loan prices than lenders with high market power in competitive lending markets ([Lian 2018](#)). [Cañón et al. \(2022\)](#) provided evidence that similar loans granted by banks with greater market power were significantly more expensive. Better-informed bank shareholders were negatively correlated with bank size (Table 5) but had the opposite effect on the cost of debt, notwithstanding the higher impact of the shareholders ($\alpha = 5\%$) who demanded greater profits through increased interest rate charges on companies. These results allowed us to validate Hypothesis 2 (H2), which stated that bank characteristics influenced debt costs.

A larger board of directors dominated by men negatively affected interest rates, and a high relative power of banks per director increased financing costs and reduced management's ability to improve loan deals through negotiation. In contrast, a board dominated by women did not affect the cost of debt. [Asiedu et al. \(2012\)](#) and [Francis et al. \(2013\)](#) concluded that companies led by women were rewarded with lower interest rates because they provided better information and were less likely to fail. However, [Coleman \(2000\)](#), [Alesina et al. \(2013\)](#), and [Mascia and Rossi \(2017\)](#) showed evidence that some lenders charged higher interest rates to female-led companies. In turn, [Cavalluzzo et al. \(2002\)](#) and [Bellucci et al. \(2010\)](#) found no differences in the conditions of access to credit relative to gender. We thus validated Hypothesis 4b (H4b) that the gender of a company's board members influenced debt costs. As expected, as turnover increased, it lowered the negotiated debt cost, and improved companies' fundamentals and thus reduced risk.

3.4. Leverage

The number of significant bank connections that a company makes generally helps to reduce their financing costs. A broad and consolidated relationship, centered on a smaller number of banks, provides greater knowledge and capacity to monitor credit agreements, allowing for an increase in the availability of resources and services to best meet the company's needs and reduce risk premiums. The intensification of the banking relationship proves to be an important competitive advantage for both parties: for the bank, insofar as it reduces information asymmetry by accumulating private information throughout the relationship, and for the company, which sees the possibility of improving, in the medium term, the contractual finance conditions ([Hernandez-cánovas 2006, 2010](#)). Bank polarization is a strong indicator of high leverage potential, as traditional and extended relations with companies and their directors create confidence and increase banks' exposure. [Leon \(2015\)](#) asserted that banks with greater market power could reduce the credit supply, while on the contrary, [Álvarez and Bertin \(2016\)](#) maintained that an increase in the number of banks was responsible for reducing credit availability. In turn, [González and González \(2008\)](#), [Cotugno et al. \(2013\)](#), and [Cenni et al. \(2015\)](#) concluded that companies with fewer bank relationships had significantly higher leverage. A justification for this can be found in [Marquez \(2002\)](#) who showed that creditors were more likely to finance companies with credit constraints in more concentrated credit markets when they internalized aid benefits. The underleveraged firms moved to their target leverage faster when bank competition was high ([Jiang et al.](#)

2017). [Cetorelli and Strahan \(2006\)](#) provided evidence that greater banking competition reduced companies' entry barriers and improved credit access, particularly for smaller firms. Banks with better-informed shareholders assume more risk in providing money to indebted companies, but the more profitable banks take less risk by making fewer loans to high-leveraged companies. Despite the risk of abuse of power resulting from an information monopoly, bank financing is an effective instrument of government. Unlike other types of indebtedness, bank debt has an associated supervisory role exercised by banking entities. In the context of information asymmetry, the relationships that companies establish with credit institutions facilitate the exchange of information through interactions over time and the provision of various financial services. These results validate Hypothesis 3 (H3), evidencing an impact of the banks' characteristics on leverage. A high bank-per-director ratio leads to more debt, which suggests that less company supervision of bank relations can translate to higher leverage. When negotiating ability or board supervising efficacy is reduced, it boosts leverage, indicating a higher risk of indebtedness. Once again, as expected, a higher turnover reduces risk and allows for a higher debt ratio.

Especially relevant is the more prudent approach to borrowing when there is a preponderance of women on the board. [Fairlie and Robb \(2009\)](#) and [Lemma et al. \(2022\)](#) suggested that women resorted to credit less often than men and experienced more substantial liquidity constraints ([Cavalluzzo et al. 2002](#); [Rybczynski 2015](#)); however, [Moro et al. \(2017\)](#) observed no gender bias regarding the loan approval rate. Men are more aggressive than women and are more likely to take on more debt and assume greater risk. These results offer strong evidence that the gender makeup of a company's board influences leverage, validating Hypothesis 4c (H4c).

3.5. Influence of Company Size

Table 6 shows the influence of company size as indicated in Table 3 on the various parameters. The control variable, turnover, had a predictable force across all sizes of company, growing with the returns, reducing interest-bearing cost, and increasing lending capacity. The results suggested that as a company gains dimension, its negotiation power increases, improving financing price conditions and quantity, and increasing performance. In contrast, [Ezeoha \(2008\)](#) and [Bhat et al. \(2020\)](#) stated that company size was significantly negatively related to financial leverage. Regarding bank characteristics, the analysis output showed some patterns. Across all sizes of company (except micro), a high number of banking connections reduced the weight of the debt-gearing ratio, and increased interest cost. Having a large number of bank relations jeopardizes the proximity and confidence effect amongst banks and company managers as the banks do not want to assume a more significant share of the company's risk, and consequently reduce their share of company debt. Proximity and polarized relationships with banks lead to friendly and confident interactions between banks and company managers, increasing leverage capacity. These close relationships enhance the bank's knowledge about the company and may reduce the perception of risk, although it increases exposure. Big companies have more varied bank relations than smaller companies (see further information with bank characteristics by company size).

Table 6. Estimation by company size.

| | Microcompanies | | | Small Companies | | | Average Companies | | | Big Companies | | |
|--------------------|----------------|-------------|-------------|-----------------|-------------|--------------|-------------------|-------------|-------------|---------------|-------------|-------------|
| | ROA | Loginterest | Debt_Assets | ROA | Loginterest | Debt_Assets | ROA | Loginterest | Debt_Assets | ROA | Loginterest | Debt_Assets |
| Logbanks | −1.531 * | 0.0705 | −0.0352 | −2.624 *** | 0.233 *** | −0.0241 * | −1.150 | 0.226 + | −0.0399 ** | −0.366 | 0.296 * | −0.0418 * |
| | [−2.38] | [0.84] | [−1.57] | [−8.76] | [3.62] | [−2.06] | [−1.46] | [1.69] | [−2.74] | [−0.49] | [2.00] | [−1.96] |
| Banks_director | 0.938 | 0.405 *** | 0.0449 | 1.567 *** | 0.227 * | 0.0574 *** | 1.705 | 0.239 | 0.0518 * | 1.391 | −0.498 | 0.0420 |
| | [1.02] | [3.82] | [1.32] | [4.17] | [2.53] | [4.41] | [1.16] | [1.04] | [2.05] | [0.74] | [−1.30] | [0.84] |
| Gen-F | −0.282 | −0.0397 | −0.0145 * | 0.0980 | −0.0229 | −0.00988 *** | 0.00441 | 0.0282 | −0.00363 | −0.534 ** | 0.0580 + | 0.00750 |
| | [−1.47] | [−1.45] | [−2.18] | [1.56] | [−1.50] | [−4.84] | [0.03] | [1.02] | [−1.27] | [−2.99] | [1.93] | [1.20] |
| Gen-M | −0.346 + | −0.00510 | 0.00917 + | −0.326 *** | 0.0214 + | 0.00831 *** | −0.256 * | 0.0353 | 0.00603 ** | −0.0785 | 0.0365 * | −0.00278 |
| | [−1.76] | [−0.26] | [1.76] | [−5.21] | [1.67] | [3.44] | [−2.05] | [1.61] | [2.60] | [−0.79] | [2.09] | [−0.94] |
| BankShare | 0.248 | 0.0170 | −0.00430 | −0.0457 | 0.0301 | 0.00191 | −0.303 | −0.0665 | −0.00555 | 0.349 | −0.0588 | −0.00880 |
| | [1.53] | [0.63] | [−0.68] | [−0.34] | [1.32] | [0.61] | [−1.27] | [−1.50] | [−1.05] | [1.47] | [−1.03] | [−1.45] |
| BankShareholder | −0.500 | 0.0306 | −0.000821 | 0.0808 | 0.0536 | 0.0284 * | 0.412 | 0.537 ** | 0.0651 ** | −0.851 | 0.442 + | 0.0485 |
| | [−1.18] | [0.43] | [−0.07] | [0.21] | [0.70] | [2.57] | [0.47] | [3.04] | [3.02] | [−0.67] | [1.88] | [1.57] |
| BankProfit | 1.146 | 0.202 | −0.105 + | 3.489 *** | −0.315 + | −0.118 ** | −1.261 | −0.800 * | −0.0553 | −3.544 | −0.325 | −0.0671 |
| | [1.00] | [1.17] | [−1.69] | [4.27] | [−1.91] | [−3.04] | [−0.53] | [−2.21] | [−1.18] | [−1.41] | [−0.75] | [−1.10] |
| Logturnover | 2.141 *** | −0.247 *** | 0.0578 *** | 3.155 *** | −0.140 *** | 0.0519 *** | 4.481 *** | −0.292 *** | 0.0206 * | 1.627 *** | −0.207 *** | 0.0440 *** |
| | [4.35] | [−4.02] | [3.86] | [16.91] | [−3.87] | [7.70] | [12.74] | [−4.08] | [2.10] | [6.65] | [−4.14] | [5.57] |
| Logbanksize | −0.274 | −0.0440 | 0.0148 | −0.538 | −0.0868 | 0.00339 | −0.350 | −0.000571 | 0.00548 | −0.308 | 0.0107 | 0.0124 |
| | [−0.79] | [−0.56] | [0.89] | [−1.30] | [−1.28] | [0.37] | [−0.60] | [−0.01] | [0.43] | [−0.58] | [0.09] | [0.89] |
| Constant | −3.908 | −3.471 * | −0.145 | −8.941 | −3.535 ** | −0.0456 | −28.98 ** | −3.918 + | 0.152 | −5.993 | −4.481 * | −0.109 |
| | [−0.55] | [−2.33] | [−0.45] | [−1.17] | [−2.78] | [−0.27] | [−2.60] | [−1.95] | [0.61] | [−0.59] | [−2.00] | [−0.42] |
| Observations | 7440 | 6200 | 7440 | 7869 | 6963 | 7869 | 1679 | 1510 | 1679 | 1338 | 1209 | 1338 |
| R-squared | 0.009 | 0.013 | 0.005 | 0.060 | 0.015 | 0.023 | 0.089 | 0.033 | 0.016 | 0.037 | 0.040 | 0.032 |
| Adjusted R-squared | 0.008 | 0.011 | 0.004 | 0.059 | 0.013 | 0.021 | 0.084 | 0.027 | 0.010 | 0.030 | 0.033 | 0.026 |
| Mean VIF | 1.65 | 1.75 | 1.65 | 1.56 | 1.6 | 1.56 | 1.61 | 1.59 | 1.61 | 1.67 | 1.68 | 1.67 |
| Highest VIF | 2.39 | 2.93 | 2.69 | 2.2 | 2.13 | 2.2 | 2.86 | 2.81 | 2.86 | 2.63 | 2.64 | 2.63 |

Notes: t statistics in brackets; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; no multicollinearity as per VIF analysis. Data were sourced from SABI and evaluated with Stata.

The concentration of a company's credit within a bank leads to a more analytical assessment that allows them to be more assertive when defining the contractual conditions. A greater concentration of credit demonstrates the loyalty that the company dedicates to its bank and, alternatively, the existence of switching costs, especially in smaller companies. The bank's dominant position makes it possible to obtain gains in terms of information, which translates into risk reduction in the credit operations. However, when seeking to benefit from the advantages of a loyal and lasting relationship with a bank, companies must take into account that the monopoly of information acquired by the bank during the relationship, combined with the degree of opacity inherent to them, can also produce damages when the benefits of the relationship are not bilateral. Information asymmetries between the bank and the company are reduced throughout the relationship, leading to efficiency improvements through multiple channels. A stable relationship makes it possible to establish long-term credit agreements, increasing the value. This objective is achieved, for example, by reducing the required guarantees and implementing intertemporal mechanisms to subsidize the cost of loans. The information collected by the creditor over time and used later reduces supervision and follow-up costs and lessens the free-rider problem as the bank internalizes the benefits of the investment. The high level of monitoring increases the value, making it possible, for example, to alleviate the problems resulting from managers' opportunistic behavior.

The only 'strong' evidence for the influence of a bank's shareholder structure arises in small ($\alpha = 5\%$) and average-sized ($\alpha = 1\%$) companies. The weight of better-informed shareholders on a bank's structure directly affects the interest rate and debt leverage ratio. Companies that work with banks having a more concentrated share capital of informed investors are smaller (Table 5); banks charge average companies more to borrow money and allow a higher debt ratio for small and average companies. This may be due to low negotiation ability, low financial literacy among company managers, or an increase in a bank's risk perspective as larger companies demand more money and incur higher absolute risk. The conclusion points to a bigger bet by banks on smaller companies. Larger companies work with banks with a less institutionalized shareholder structure which corresponds to larger banks, according to the correlation shown in Table 5.

The results do not reflect the familiar feeling that larger banks allocate a significant part of their assets to large companies. Small companies are generally more opaque from an informational point of view, preferring to be financed by smaller banks. Large banks make decisions based on standard criteria drawn up from financial statements called 'cookie-cutters'. Alternatively, 'soft information' is decisive in decision making for smaller banks (Coles et al. 2001).

More profitable banks consider the association with ROA and debt leverage to have higher significance in small companies, positively and negatively, respectively. Whether by providing low-cost money or advisory services, consulting, or strategic views about improving current or creating new businesses, profitable banks lead to higher returns for companies. This is important as it allows companies to maintain a lower debt ratio, enhancing their financial strength.

The asymmetrical role in building the relationship between the bank and the company means that the direct beneficiary of the relationship is the creditor. The intensification of the banking relationship allows for the sharing of the value created (through lower borrowing costs and more flexible contractual terms), and the relationship acquires relevance for the company. In other words, it will benefit from the banking relationship whenever the bank shares the value created in the relationship.

As expected, there are fewer female board members than male board members in small companies. However, the number of companies with boards including at least one female member surpass the number of companies with one male board member (Table 7). Although prominent female board members tend to reduce leverage in micro- and small companies, bigger companies present a higher risk, as a female-dominated board

is associated with lower returns and higher interest rates. We identified two possible reasons for this. First, creditors view women as less capable of running businesses than men. This prejudice on the part of creditors leads to worse financing conditions. Second, women may be more likely to face higher costs due to lower negotiating capacity with creditors. Furthermore, a preponderance of male board members can increase funding costs in big companies. In small and average-sized companies, male-dominated boards result in lower ROAs and higher debt costs. Women directors on the board improve companies' ROAs and reduce their shares' volatility. However, this effect is more pronounced in small compared to large companies (Rahman and Zahid 2021). The size of a board can also cause problems, with larger boards taking longer to make decisions, incurring higher agency costs, and paying out larger salaries and benefits that diminish profits. Multimember boards may also lead to higher company risk as measured by leverage. In large companies, male-dominated boards with many members increase the risk of debt default and thus incur higher financing costs.

Table 7. Number of board members of each gender by company size.

| Gen-F | Company Size | | | | | Gen-M | Company Size | | | | |
|--------|--------------|------|------|------|--------|--------|--------------|------|------|------|--------|
| | 1 | 2 | 3 | 4 | Total | | 1 | 2 | 3 | 4 | Total |
| 0 | 127 | 284 | 2394 | 2830 | 5635 | 0 | 2 | 2 | 93 | 218 | 315 |
| 1 | 233 | 482 | 3109 | 3223 | 7047 | 1 | 14 | 67 | 1285 | 2259 | 3625 |
| 2 | 233 | 429 | 1409 | 1002 | 3073 | 2 | 34 | 151 | 2057 | 2667 | 4909 |
| 3 | 243 | 248 | 608 | 277 | 1376 | 3 | 69 | 248 | 1661 | 1279 | 3257 |
| 4 | 144 | 137 | 222 | 90 | 593 | 4 | 101 | 257 | 995 | 542 | 1895 |
| 5 | 85 | 59 | 90 | 34 | 268 | 5 | 108 | 240 | 723 | 218 | 1289 |
| 6 | 46 | 24 | 27 | 10 | 107 | 6 | 133 | 200 | 437 | 134 | 904 |
| 7 | 39 | 9 | 14 | 3 | 65 | 7 | 117 | 163 | 251 | 81 | 612 |
| 8 | 15 | 2 | 3 | 9 | 29 | 8 | 113 | 125 | 150 | 40 | 428 |
| 9 | 9 | 5 | 4 | 2 | 20 | 9 | 125 | 94 | 99 | 20 | 338 |
| 10 | 7 | 0 | 2 | 3 | 12 | 10 | 84 | 58 | 53 | 10 | 205 |
| Others | ... | ... | ... | ... | ... | Others | ... | ... | ... | ... | ... |
| Totals | 1190 | 1681 | 7894 | 7486 | 18,251 | Totals | 1190 | 1681 | 7894 | 7486 | 18,251 |

Note: 1, big, 2, average, 3, small, and 4 micro-companies.

Supervisory boards overseeing bank relations (banks per director) are only relevant for micro-, small, and average-sized companies. Low board supervision of bank relations (higher bank:director ratio) increased returns, interest, and debt in small companies. It also increased interest rates and debt in micro- and average-sized companies, respectively. Small companies are characterized by a smaller number of board members compared with large companies. In our sample, small companies had an average BoD consisting of one woman and three men, against 2.4 and 7.2 for large companies. The average number of banks per company was 2.5 for small and 3 for large. The mean number of banks per director was 0.66 for small against 0.35 for large companies. Because of a lack of resources, small companies allocate a higher degree of work to a lower number of board members to reduce costs and improve returns (Table 6). We analyzed operating returns but not net return, so debt costs were not included in the ROA. However, the reverse side of this cost-saving leads to a higher interest burden and higher debt ratio due to the lack of supervision of banking relations and reduced efficiency in negotiations. Additionally, the reduced shareholder equity that characterized small companies could also increase leverage. Bank share had no association with company characteristics (Table 8).

Table 8. Bank characteristics by company size.

| | Banks_ Director | Bank Shareholder | Log Banksize | No. of Banks | BankProfit |
|-------------|----------------------------|-----------------------------|-------------------------|---------------------|-------------------|
| Size | Mean | Mean | Mean | Mean | Mean |
| 1 | 0.34123807 | 1.2242169 | 17.965283 | 3.0630252 | −0.08754812 |
| 2 | 0.50611657 | 1.2692682 | 17.801556 | 3.0814991 | −0.0813828 |
| 3 | 0.66456148 | 1.2909413 | 17.722722 | 2.4537624 | −0.06897586 |
| 4 | 0.7119631 | 1.2864378 | 17.676897 | 1.9269303 | −0.06227995 |

4. Conclusions

Given the importance that smaller companies assume in the Portuguese economy, the relevance of bank financing and how it is managed plays a significant role in their activity. The objective of this study was to evaluate the impact of banking characteristics, the gender of the companies' administrators, and the influence of supervisory capacity on the return, cost of debt, and financial structure of 18,300 Portuguese companies with a turnover of more than EUR 1 million. Information was gathered for the year 2020, and the data to construct the main variables were extracted from the SABI (Iberian Balance Sheet Analysis System) database. For data processing, we used LASSO (least absolute shrinkage and selection operator) regression, which is suitable when the models show high levels of multicollinearity. Afterwards, the OLS-robust standard-errors approach was applied by company size. We also addressed the heteroscedasticity correction and potentially the serial correlation along with the cluster-robust standard-errors model, according to the methods of [Arellano \(1987\)](#). As far as we know, this is the first work focusing on the association of bank characteristics, board members' gender, and supervising ability with return, cost of debt, and finance structure of Portuguese companies stratified by size.

The results of this work allowed us to conclude that multiple bank relations had a crucial negative influence on micro- and small companies' returns, where connections with many banks jeopardized attention and did not afford much diversification in the sources of financing. With the exception of microcompanies, multiple bank relations may reduce the degree of leverage across all companies' sizes, revealing a risk effect and a nonrelational proximity effect. Profitable banks lead to higher company returns, but only for small companies. This could be due to greater efficiency and better company knowledge, more active advisory services, strategic counseling, or suggestions for more effective management. Smaller companies tend to have employees with less mastery of financial knowledge. The lending banks also have a discipline perspective on credit concession, keeping small and average-sized companies under high debt restrictions.

Better-informed bank shareholders (management, institutional, or government) tend to advise their banks to charge higher interest rates and require higher leverage ratios. They usually are focused on higher profits, supporting the local Portuguese economy, taking more risks, and sometimes accepting a lower bank return due to the potential of nonperformance loans, mainly on small and average companies.

Compared with largely male boards, predominantly female boards tended to produce asymmetric results, especially for the smallest Portuguese companies. Female members tended to opt for lower debt ratios, while the opposite was true for male board members. The prudent cautiousness of women was well-represented in these Portuguese companies. In large companies, their preponderant numbers of board members increased the cost of debt, but the effect tended to be a result of the more assertive male board members. The results also suggested that female board members were less prone to indebtedness due to greater risk aversion than their male counterparts. The supervisory capacity of the board on bank relations had a more substantial impact on the supported financing costs of micro- and small companies, as their boards usually were small and less capable in handling financial matters effectively. Lower supervisory capacity may lead to higher financial leverage in

small companies and increased ROA and profits, because of the savings from lower board members' costs.

Our empirical evidence suggested that firms with enhanced banking relationship intensity (fewer bank connections per company) had improved profitability; smaller banks reduced financial constraints by providing more credit at lucrative rates. This issue became necessary when the relevance of large banks in the Portuguese and European contexts increased. It is hoped that this work will attract the attention of banking professionals, academics, and government leaders and motivate them to study the questions more deeply and compare their influence across sectors of other European countries. Proactive competitive policies that suppress banks' market power can reduce the incentives and needs of banks to invest in the acquisition of private information and relationship loans, decreasing the situations under which companies finance themselves. In terms of business, previous literature has also shown that banking competition can reduce financial exclusion and increase the availability of credit. Thus, policymakers must consider the balance between the pros and cons of different strategies to promote competition and the consequences for different types of economic agents. In brief, bank characteristics and board gender strength strongly guide the finance aggregates of companies according to their size.

4.1. Theoretical Implications

This study contributes in several ways to the literature. Our research findings resulted in three significant theoretical implications:

1. First, we used new banking characteristics, and an original variable to represent the board's ability to handle banking relationships.
2. Second, we studied the impact of bank characteristics on performance, debt cost, and leverage, going further and introducing five important variables: (i) bank share, reflecting the strength of the bank presence in Portuguese companies; (ii) a log of the banks' assets, a measure of the size and the power of the banks' association with a specific company; (iii) the banks' net profit margins on assets demonstrating their effectiveness in supplying credit; (iv) the banks' shareholder type measured by their type of shareholders from a scale of noninformed to most informed; and (v) the branches or subsidiaries where the banks conducted their activities in Portugal.
3. Lastly, we separated the samples into different dimensions to understand the differences in the explanatory factors in performance, debt cost, and leverage in the Portuguese economy.

4.2. Practical Implications

The present investigation brings practical implications for managers, shareholders, potential investors, and civil society. They will all be better able to understand the effects of banking relationships and the gender characteristics of the board on business activity.

1. Managers are responsible for making daily decisions in the company; therefore, they must recognize how their decisions influence the firm's debt features and performance.
2. This work is also important for current and potential shareholders, as the creation of business value is strongly conditioned by restrictions on financing and business management.
3. Lastly, the results provided may allow policymakers, financial analysts, and investors to better understand and act on banking characteristics and banking relationships with firms' management, improving them to further optimize company performance, capital structure, and debt costs. Moreover, considering that this study was conducted on a sample of small companies from a small country in a year of severe economic turbulence, it would be worthwhile to identify counterpart countries to see if their behavior is similar. This would also help to develop action plans for governments, banks, and company leaders to deal with this issue.

Thus, academics, researchers, and professionals can utilize the findings of this work to understand the stage of development of this theme in the context of a small economy, and develop new approaches for addressing the growing relevance of these issues in the scope of business finance.

4.3. Limitations and Lines for Future Research

With regard to limitations, we highlighted the fact that this investigation was a cross-sectional study for 2020, the pandemic year, and the conclusions only referred to that time frame. Consequently, this study did not include comparable information (e.g., years outside the pandemic) due to database limitations, making the result less persuasive than a more extensive study. Future studies may benefit from broader sample coverage. We studied Portuguese companies of different sizes according to Decree-Law 372/2007; however, this work did not characterize the data according to different company sectors or geographical locations within the Portuguese territory, which may have expanded the generalizability of the study and produced some additional results.

We believe that future research should explore additional solutions for reducing information barriers between the banking system and companies, promoting the effectiveness of credit channels and cost reduction in EU countries.

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