

The relation between the property structure and the leveraged debt cost via debenture issues in Brazil

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Abstract

Objective: This research aimed to identify the relation between the percentage of direct participation in the property (control) and the leveraged debt cost via debenture issues in Brazil.

Method: The cost of debt (spread of interest rate of debenture issues) was regressed with the property structure (direct property concentration, direct control concentration and excessive control), using linear and quadratic regressions for the period from 2011 to 2018.

Results: The results found suggest that, among the analyzed property/control structure characteristics, only the concentration of direct control is relevant for the debenture holders when pricing the securities.

Contributions: The research contributes to the literature by evidencing that the relation between control concentration and spread is quadratic. Hence, to a certain extent, the increase in the control concentration is reflected in an increased cost of debt; nevertheless, when this concentration becomes very high, the creditors interpret it as something beneficial, reducing the cost of debt. These results suggest that the positive and negative effects deriving from the control concentration are present in the debt leverage; nevertheless, the benefits only tend to appear when the control concentration becomes high.

Key Words: Cost of debt. Debenture Issue Costs. Agency Costs. Property Structure. Stockholder Concentration.

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1. Introduction

Third-party capital represents a significant source of funds allocated to investments in companies, even to publicly-traded companies. Latin American companies, for example, have debt levels similar to those of companies in the United States of America, despite experiencing relatively lower tax benefits, higher bankruptcy costs and restricted access to several sources of financing, mainly long-term (Céspedes, González, & Molina, 2010).

The finance literature recognizes that there are potential conflicts whenever owners and creditors diverge in their respective utility functions, risk preferences, and information (Jensen, 1986; Jensen & Meckling, 1976; Myers, 1977). Nevertheless, the main corporate governance mechanisms are, a priori, designed to promote the alignment of interests between owners and managers and even between owners (Shleifer & Vishny, 1997). There are reasons to believe that certain corporate governance mechanisms may be assessed unfavorably by debt bondholders, particularly the configuration of ownership (Ashbaugh-Skaife, Collins, & LaFond, 2006; Jiraporn, Chintrakarn, Kim, & Liu, 2013).

Research efforts have been made to consider the effect of the ownership structure, as a corporate governance mechanism, on the cost of debt. Efforts are predominantly focused on analyzing companies from the United States of America, Europe, and Asia, as found in the literature review. In general, the companies listed on the Brazilian stock exchange present particular ownership structure characteristics in relation to the diffuse ownership companies of the conventional corporate control model in the United States of America and the United Kingdom, with high ownership (control) concentration and low contestability of the dominant stockholder's power (Crisóstomo, Brandão, & López-Iturriaga, 2020). In addition, the exercise of corporate control is consistently preserved by the issuing of double class shares and pyramidal structures (Aldrighi, 2014; Aldrighi & Mazzer Neto, 2007; Aldrighi & Postali, 2011; Bortolon, 2013). Consequently, there is an unequal distribution of the control power that can lead the dominant owner to exert a strong influence on the definition of the investment policy, among other consequences, in order to meet his personal interests at the expense of the other shareholders' interests (Bebchuk, Kraakman, & Triantis, 2000; Claessens, Djankov, Fan, & Lang, 2002; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000).

To address the effect of the ownership structure on the cost of debt in the Brazilian capital market, the objective outlined seeks to identify the relationship between the percentage of direct participation in the property (control) and the cost of borrowing via the issuing of debentures in Brazil. To characterize the punctual effect of a specific corporate governance mechanism on the cost of debt, debentures are considered as a specific type of debt collection, with the potential to generate conflicts of interest between owners and creditors. The research is relevant in this context, as the issue of debentures can be considered one of the main types of long-term financing available to Brazilian companies, even when compared to equity issues. According to data from the Capital Markets Bulletin 02/2020, of the Brazilian Association of Financial and Capital Market Entities (Anbima), the issuing of debentures between 2014 and 2019 totaled approximately R \$ 626 billion, while fundraising via share issues (Initial Public Offerings and follow-ons) totaled approximately R\$ 185 billion (ANBIMA, 2020).

In contrast with previous research on the cost of debt in Brazil (e.g. Fonseca & Silvera, 2016; Konraht, Camargo, & Vicente, 2016; Barros, Silva, & Voese, 2015), the interest rate spread on the debentures does not present the potential problems present in the debt cost proxy when determined by the ratio between financial expenses and interest-bearing liabilities. Financial expenses comprise interests and other financial charges, such as monetary and exchange variations borne by companies, not only in attracting loans and financing but also those relating to payment terms signed with suppliers in general and discounts granted, for example. In addition, the interest-bearing liability can be influenced by the volume of debt that companies capture or amortize in periods close to the reporting period, which includes noise in the measurement of the cost of debt.

The results obtained suggest that, among the characteristics of the direct property structure considered in the analysis (direct property concentration, direct control concentration, and excessive control), only the percentage of direct control concentration (voting rights) showed to be relevant to creditors when the debentures are priced. The existence of a quadratic relationship between the concentration of control and the spread of the debt interest rate via the issue of debentures suggests that the concentration of control increases the cost of debt and, as this concentration of control becomes excessively high, the cost of debt tends to decrease. This reduction in the spread implies that creditors may be considering the concentration of control as a factor that potentially reduces the risk of an exchange of control occurring over the term of the debt contract.

The effect of the ownership structure on the company's value, from the perspective of creditors, is a controversial point in the corporate governance literature as, from the perspective of creditors, the greater the concentration of control, the lower the required return. It is therefore conjectured that the concentration of control would be associated with a lower likelihood of changing the company's management and its financial policies during the term of the debt contract. In other words, for creditors, the concentration of control would represent the maintenance of the levels of risk and compliance with contractual covenants after the credit is granted.

The analysis of the results presented is understood as an indication of the creditors' behavior in the pricing of debentures in Brazil and needs to be evaluated with caution as, to identify the ownership structure, we used only the direct participation percentages of the owner(s) appointed as controller(s) when the company disclosed the ownership structure. Since 2005, the issue of double-class shares in the Brazilian capital market has decreased, while the indirect control structures have increased (Andrade, Bressan, & Iquiapaza, 2014; Bortolon & Leal, 2014). Despite the relevance of indirect control structures in the Brazilian capital market, obtaining the percentage of ownership of the ultimate shareholder is not one of the easiest tasks, nor does it even indicate whether a family owns the property. Part of the challenge concerns the presence of companies not listed on the stock exchange in pyramidal structures and the time required for the collection. In addition, research has shown that the percentage of direct participation of the dominant owner is close to the percentage of indirect participation of the last shareholder, subject to the specificities of the sample and the period covered (Aldrighi, 2014; Bortolon, 2013; Grillo, Reina, Bortolon, & Sarlo Neto, 2017). These and other limitations in the execution of this study indicate that there are developments to be explored in future research that can better define the outlines of the reported effect.

2. Literature review and hypothesis development

The use of third party capital favors the sharing of investment risk with creditors. At this point, overinvestment, underinvestment, and depletion of property can explain certain debt agency costs. The adoption of non-profitable (asset replacement) or excessively risky (risk-shifting) investment projects increases the variance of the firm's future cash flows and disproportionately transfers the negative results that may be obtained (Jensen, 1986; Jensen & Meckling, 1976). Likewise, investment projects with positive net present value can be rejected if residual profits are preferably transferred to creditors, characterizing the problem of underinvestment (Myers, 1977), even if the payment of dividends is preferable. In all these circumstances, the risk of not receiving the contractual claims set by creditors would be changing, especially if the indebtedness becomes relatively high, a situation in which the efforts of insiders to control the risk of financial constraint, bankruptcy and liquidation will supposedly be quite limited (Jensen, 1986, Aslan & Kumar, 2012).

Creditors, to the extent that they foresee the existence of these agency costs, certainly demand higher interest rates and include in the debt contracts restrictive clauses to demand proper guarantees and impose mechanisms to monitor the use of the assigned resources. Under this argument, it is conceivable that there is no significant relationship between the ownership structure (control) and the cost of debt. It is not always possible to deal with all future contingencies though, nor even to find inexpensive solutions for monitoring investments in negative net present value projects (Steijvers & Vooerdeckers, 2009). Therefore, the cost of debt tends to increase as conflicts of interest between insiders and creditors increase or cannot be remedied (Aslan & Kumar, 2012).

Sanchez-Ballesta and García-Meca (2011) evaluated the influence of ownership concentration and identity of owners on the cost of debt in a sample of Spanish companies between 1999-2002. The reported results indicate a significant effect restricted to the property held by the chairman, the government, and the banks. In general, the identity of the owner seems to have contributed to the reduction in the cost of debt, while the concentration of ownership has not shown to be statistically relevant. Lugo (2019) presents empirical evidence on the cost of bank loan debt between 1996 and 2010 from companies in several countries in Europe, Asia, and also the United States of America. The main result presented appoints that the shareholding interest of insiders is inversely related to the cost of debt, taking the form of an inverted U.

In the Brazilian context, little is known about the exclusive relationship between ownership structure and debt cost, partially because the research results are difficult to reconcile. Barros et al. (2015) observed that corporate governance attributes that make up a governance index had a negative influence on the cost of debt between 2008 and 2010, while the adoption of distinguished listing levels on the stock exchange was not statistically significant. Fonseca and Silveira (2016) found that the cost of debt tends to be lower due to the percentage of preferred shares issued by companies and due to the adoption of distinguished listing levels on the stock exchange in the period from 2010 to 2014. But two other proxies of the direct ownership structure (percentage of participation of the largest shareholder and the difference between control and ownership of the largest shareholder) did not have a significant effect. Silva, Santos, and Almeida (2012) found that, between 2005 and 2010, the concentration of control was positively associated with the credit ratings for debentures. Konraht et al. (2016) presented evidence that excessive control has a positive influence on the cost of debt between the years 2011 and 2014.

In Western Europe and East Asia, the cost of debt is significantly higher when there is a divergence between ownership and control (Aslan & Kumar, 2012, Lin, Ma, Malatesta, & Xuan, 2011) and even for the cost of capital (Guedhami & Mishra, 2009). Also, in companies in Europe and Asia, as presented by Boubakri and Ghouma (2010), the identity of the owner also influences, in such a way that excessive family control has a positive effect on debt bond spreads and a negative effect on the ratings of these securities. The ability of insiders to effectively control corporate resources and to engage in activities that permit gaining private control benefits is positively related to the ownership level they hold (Shleifer & Vishny, 1997). Nevertheless, the insiders' entrenchment may happen due to the difference between property and control rights (excessive control). In many Brazilian publicly-traded companies, this situation is presumível because the practice of corporate control has been consistently preserved through the issue of double-class stocks and pyramidal structures (Aldrighi & Mazzer Neto, 2007; Aldrighi & Postali, 2011; Bortolon, 2013). Thus, the following hypothesis is presented:

H1: The difference between control and property rights (excessive control) increases the cost of the debt.

From the perspective of debt holders, the effect of ownership structure on the cost of debt may be different from that of insider and outsider owners. Creditors may care less about insider entrenchment, as long as the company's value is kept above the default limit. In addition, owners with large non-diversified holdings may have incentives to allocate resources in order to preserve them, that is, to avoid dilution of capital and preserve the exercise of corporate control, the likelihood of using third party capital increases. On the other hand, this relationship of dependence will cause them to become more concerned with the reputation in the market and, therefore, with the need to maintain financial policies throughout the term of the debt contracts. This somewhat decreases the moral risk borne by creditors after contracting the debt (Ashbaugh-Skaife et al., 2006; Jiraporn et al., 2013).

Reputation also figures among the arguments presented by Anderson, Mansi, and Reeb (2003). They identified that, in the United States of America, the concentration of ownership in the hands of the founding family is negatively associated with the cost of debt and explains that the cost of debt would be lower in these circumstances because large shareholders, including families, tend to be undiversified. As the founding family is more exposed to idiosyncratic risk, it tends to be more concerned with its reputation in the market and, in order to achieve long-term expectations, tends to avoid excessively risky projects.

Jiraporn et al. (2013) evaluated the relationship between corporate governance and the cost of debt for a sample of companies in the United States of America. In this case, corporate governance was represented by the ISS (The Institutional Shareholder Services) index with categories of governance standards and with emphasis on the board of directors, audit, by-laws, executive and director compensation, property, among others. The credit ratings and yield spread were used as a measure of the cost of debt. The result obtained showed that strong corporate governance significantly reduces credit ratings and increases yield spread. One possible explanation for this is how aligned the interests of management and owners are. The greater this alignment (strong corporate governance), the greater the possibility of underinvestment, while the high concentration of control in the hands of managers (weak corporate governance) would reduce the possibility of underinvestment.

Klock, Mansi, and Maxwell (2005) evaluated the effect of a governance index that contains several anti-takeover and shareholder protection devices on the cost of debt financing for a sample of companies in the United States of America, covering the period 1990-2000. Evidence indicates that stricter anti-takeover devices reduce the cost of debt financing. This result suggests that, in companies where it is more difficult to remove management, the probability of being evaluated favorably in the debt market would be increasing. This finding elucidates that, although the more rigid anti-takeover devices disadvantage the owners, as they impose greater difficulty to act against the management of the company, creditors tend to conceive of this fact as a positive aspect in the dimensioning of the expected return and risk for the provision of funds.

Consistent with the conjecture that creditors assess ownership structure in a very particular way, Byun, Choi, Hwang, and Kim (2013) found that companies affiliated with large Korean business groups had a substantially lower cost of debt between 2001 and 2007 than independent companies. They interpreted that creditors are willing to grant credit with a lower interest rate and other conditions more favorable to companies affiliated with an economic group because they would be realizing that additional protection is possible. Otherwise, business groups would serve as a credible commitment to rescue member firms with financial problems (co-insurance effect). Considering the above, the following hypothesis is formulated:

H2: The property (control) concentration reduces the cost of the debt.

3. Methodological Procedures

The sample consists of debenture issues registered in Brazil, between 2011 and 2018, carried out by publicly traded non-financial companies, excluding incentive debenture issues and those that were canceled soon after the issue announcement. The beginning of the time frame in 2011 results from the availability of data, as the data related to the control and ownership structures were collected from the reference Form of the year prior to the debenture issue, and the beginning of the disclosure of this report occurred in 2010. The end of the time frame in 2018 was due to being the closest base date for the collection and tabulation of property structure data in the data collection period of the research. The exclusion of the incentive debentures was due to the fact that these securities are exempt from income tax on the remuneration earned by the debenture holders. As a result, the tax benefit contained in the incentive debentures affects the real interest perceived by the creditors. Consequently, the spread of the debentures is differentiated for the incentive debentures. Thus, 730 issues of debentures were identified in the National Debentures System, 84 (11.9%) of which are open to the general public (CVM Normative Instruction No. 400), while 643 (88.1%) were issued in the modality with restricted efforts (CVM Normative Instruction 476). The modality open to the general public is the classic debenture issue format, in which the company issues securities that can be acquired by any investor; the issue modality with restricted efforts is offered to a limited group of professional investors, totaling a maximum of 75 professional investors who receive the offer, only 50 of whom can subscribe or purchase these securities (Comissão de Valores Mobiliários, 2009). These 730 identified debentures added up to a total of 980 series of debt securities, as each debenture can contain more than one series.

The series of debentures issued and maintained in the sample have several criteria for calculating remuneration, including a specific reference index and spread. Table 1 shows the remuneration criteria for the series of debentures analyzed, as well as the indices used as a reference.

Table 1

Reference indices used in the debenture series

Index	Debenture series	Proportion	Final sample analyzed: series with all financial data available for collection
DI + spread %	542	55,3%	361
% on DI	311	31,7%	-
IPCA + spread %	108	11,0%	-
Others (post)	5	0,5%	-
No index	4	0,4%	-
TJLP	4	0,4%	-
Pre-fixed rate	3	0,3%	-
Dollar	1	0,1%	-
IGP-M	1	0,1%	-
TR	1	0,1%	-
Total	980	100%	361

Legend: DI: Interbank deposits; IGP-M: General Market Price Index; IPCA: National Extended Consumer Price Index; TR: Reference Rate; TJLP: Long-Term Interest Rate.

Obs.: the 980 series are contained in 730 debenture issues. The survey date of these data was June 10th 2019. The debenture series without available financial data in the Economatica® database or on the website of the Brazilian Securities Commission to calculate the research variables were excluded from the sample. That explains the difference between the 542 initially identified series and the 361 with all data available for data analysis.

Source: elaborated by the authors.

As each form of remuneration has a specific spread, the spread of series with different indices is not comparable, nor can the 980 series of debentures be analyzed globally in a single regression model. As a result, the criterion was to analyze the series of debentures that adopt the remuneration in the form of the interbank deposit rate (DI), plus a fixed additional spread rate (DI + spread%). This criterion was adopted because this form of remuneration was the most used among the 980 series, which guarantees a greater amount of data for analysis. Also, these series are the most representative of the debentures issued in Brazil according to Konraht and Soares (2020). In addition to these aspects, Konraht and Soares (2020) found that debentures offering remuneration in the form of “IPCA + spread%” and “spread% over DI” tend to have debt characteristics or firm characteristics different from other issue modalities, which indicates that these modalities are chosen by companies that carry out issues of greater maturity, such as those that remunerate in the form “IPCA + spread%”, or are issued by companies with greater growth options and that offer a larger number of restrictive clauses to protect creditors, as is the case of companies that pay “spread% over DI”. Thus, the selection of other series could lead to a sampling bias if securities with specific debt and company risk characteristics were selected, when compared to series in general, such as, for example, selecting debt securities with longer maturities or issued by companies with greater growth opportunities.

Approximately 55% of the series of debentures collected offer remuneration at the interbank deposit rate plus a fixed spread rate (DI + spread%). Thus, the cost of debt, a variable dependent on the study, will be measured at the fixed spread rate in relation to the DI rate. The fixed spread rate used will be that already adjusted to the result of the bookbuilding process, a procedure similar to that adopted by Sheng and Saito (2005) and Konraht and Soares (2020). The 361 series of debentures that made up the final sample were issued by 131 companies. These companies operate in several economic sectors, mainly electricity (27.7% of the series), car rental (11.9% of the series), road transportation (9.7% of the series), residential construction (8.9% of the series) and water and sanitation systems (5.5% of the series). These sectors account for approximately 64% of the debt securities in the sample.

Given that each debenture issue is carried out on a specific date over the years, it was decided not to use panel data, as the data structure is not sequential, and there were cases of companies with only one debenture issue during the sample period, while others issued debentures more than once in the period; thus, the research hypotheses were tested using pooled Ordinary Least Squares (OLS). In Equation 1, the regression model specified for the relationship tested in this research is presented.

$$\begin{aligned}
 Spread_i = & \alpha_i + \beta_1 PropertyStructure_i + \beta_2 Size_i + \beta_3 Indebtedness_i + \beta_4 Profitability_i \\
 & + \beta_5 SecuredGuarantee_i + \beta_6 Selic_t + \sum_{k=2011}^{2018} \delta_k Year_k + \varepsilon_i
 \end{aligned} \quad (1)$$

In Table 2, all variables in the model are presented.

Table 2

Description of research variables

Variável	Sinal	Operacionalização	Referência
Debt spread		Natural logarithm of additional interest rate in relation to DI rate. This is the proxy for the cost of debt, the dependent variable in the model	Sheng and Saito (2005)
Direct property structure a) direct control concentration	-	Percentage of ordinary stocks (ON) held by controlling stockholder(s)	Caixe and Krauter (2013); Claessens et al. (2002); Silveira, Barros and Famá (2008)
Direct property structure b) Direct property concentration	-	Index between sum of ordinary (ON) and preferential stocks (PN) held by controlling stockholder(s) and total company stocks	Authors
Direct property structure c) excessive control	+	Index between direct control concentration and direct property concentration minus one unit (control/property - 1)	Cronqvist and Nilsson (2003)
Company size	-	Natural logarithm of total assets	Boubakri and Ghouna (2010); Caixe and Krauter (2013)
Indebtedness	+	Index between current liabilities and total assets	Boubakri and Ghouna (2010); Byun et al. (2013); Li et al. (2011); Lugo (2019)
Profitability	-	Index between accumulated EBITDA of four terms previous to the issuing of the debentures and total assets	Byun et al. (2013); Okimura, Silveira and Rocha (2007); Silveira et al. (2008)
Secured guarantee	+/-	Dummy variable equal to 1 if the debenture has a secured guarantee and 0 if not	Byun et al. (2013)
Year of issue	+/-	Annual dummies	Authors
Selic	+	Annual Selic rate of issuing period of the debenture	Authors

Source: elaborated by the authors.

As shown in Table 2, three aspects of the ownership structure are considered: (a) direct control concentration; (b) direct property concentration; and (c) excessive control. The owner or group of owners identified as the owner(s) of the company on the reference form was considered as the company's controller. When there was an indication of more than one controller, the sum of the interests of the indicated group was performed. The three aspects of the ownership structure were calculated considering the direct holdings and this is a limitation of the research, given that it does not take into account the indirect holdings that occur through pyramidal control structures and actions without voting rights. Comparisons between these two forms of measurement indicate that there is a relative similarity in the values calculated by the two methods though, as presented in Grillo et al. (2017). In addition, tests carried out by Silva (2004) indicate that the relationship between the characteristics of ownership/control concentration, measured directly and indirectly, and the value of companies is substantially the same, although the measuring of indirect holdings has greater explanatory power.

In addition to these property structure variables, other variables that can also affect the cost of debt were included in the regression model. These variables represent characteristics of the company, of the debenture and macroeconomic aspects, and are as follows: (a) size of the firm; (b) indebtedness; (c) profitability; (d) offering a secured guarantee on the debenture; (e) effective Selic rate in the term during which the debt was issued; and, (f) annual dummies. The size of the firm is a characteristic that can potentially represent part of the creditors' risk, and larger companies are expected to have lower debt costs. In larger companies, the risk of default would be reduced due to the possibility of selling the assets, in the face of financial difficulties, in addition to the reputation effect. Indebtedness is also a variable that represents a risk, as more indebted companies tend to have a higher risk of going into insolvency and delaying payments to creditors; thus, it is expected that, in more indebted companies, the cost of debt will be higher. Profitability is a measure of the company's economic strength; thus, it is expected that the greater the company's profitability, the lower the cost of borrowing will tend to be, given that the likelihood of facing economic and financial difficulties will be lower in more profitable companies. The secured guarantee is an instrument to protect creditors; thus, it is expected that debentures that offer secured guarantees to creditors will have a lower cost of debt, considering that creditors will have greater security of recovering the capital provided. On the other hand, evidence indicates that the secured guarantee can be used as a complementary mechanism to the interest rate to protect creditors (Bharath, Sunder, & Sunder, 2008). In this perspective, it is expected that, in riskier companies, the cost of debt will be higher and, also, that there is a greater probability of containing a secured guarantee. Due to this theoretical impasse, the expectation for the expected signal of the variable secured guarantee is left open. The Selic rate is the basic interest rate in Brazil; thus, it is expected that, as this rate increases, there will also be an increase in interest rates on corporate debt securities (debentures). Finally, the annual dummies are inserted in the models to control for macroeconomic effects that occurred in Brazil during the analysis period, and which may have affected the interest rates charged to companies.

4. Results

Table 3 shows the descriptive statistics for the variables used in the empirical investigation. Panel A of this table contains the temporal distribution of the sample's debt securities; Panel B contains the statistics of the 361 observations that made up the research sample; Panel C shows the sample statistics separated by the debenture issue mode. From the data in Panel B, it appears that, on average, the spread of the additional debt at the DI rate is 1.89% p.a. This variable is heterogeneous, with a minimum of 0.24% and a maximum of 10.2%. The size of the companies is also quite heterogeneous and, on average, corresponds to R \$ 8.9 billion. Total assets are mainly financed by third-party capital, with an average of 63%, and this is relatively homogeneous among the companies in the sample.

Table 3

Descriptive statistics

Panel A: Temporal distribution of debenture series								
Year	2011	2012	2013	2014	2015	2016	2017	2018
Number of series	42	51	52	30	38	17	58	73
Frequency	11.6%	14.1%	14.4%	8.3%	10.5%	4.7%	16.1%	20.2%

Panel B: Descriptive statistics of dataset									
Variable	N	MN	SD	VC	Min	Q1	Md	Q3	Max
Spread (%)	361	1.89	1.1	0.60	0.24	1.1	1.6	2.4	10.2
Secured guarantee (%)	361	15.8	-	-	0	0	0	0	1
Company size (billion R\$)	361	8.9	13.3	1.5	0.1	2.2	4.5	9.9	107
Indebtedness (%)	361	63.0	14.1	22.6	21.3	53.7	63.0	71.6	95.2
Profitability (%)	361	2.4	4.1	1.7	-19.0	0.5	1.8	3.9	25.0
Direct control (%)	361	69.3	27.8	0.4	8.1	50.3	68.6	99.9	100
Direct property (%)	361	64.7	29.7	0.5	8.2	39.9	64.9	99.9	100
Excessive control (%)	361	4.6	11.7	2.5	-5.1	0.0	0.0	0.0	48.1
Selic (%)	361	9.6	2.5	25.8	5.8	7.2	9.9	11.2	14.8

Panel C: Observations segregated by debenture issuing modality												
Variable	Open to the general public						Restricted efforts					
	N	MN	SD	1Q	MD	3Q	N	MN	SD	1Q	MD	3Q
Spread (%)	34	1.76	0.8	1.1	1.7	2.2	327	1.91	1.2	1.1	1.6	2.5
Secured guarantee (%)	34	5.9	23.9	-	-	-	327	16.8	37.5	-	-	-
Company size (billion R\$)	34	10.9	10.5	3.4	7.0	15.3	327	8.6	13.5	2.1	4.2	9.8
Indebtedness (%)	34	67.1	11.8	57.1	64.9	79.9	327	61.8	14.3	52.9	62.9	71.6
Profitability (%)	34	3.1	3.7	0.9	2.1	4.7	327	2.3	4.1	0.5	1.7	3.8
Direct control (%)	34	70.2	31.0	36.4	79.5	100	327	69.0	27.6	50.3	65.4	99.8
Direct property (%)	34	64.0	33.3	31.0	71.3	100	327	64.5	29.4	40.9	64.0	99.7
Excessive control (%)	34	6.1	12.8	-	-	6.8	327	4.5	11.6	-	-	-

Legend: N: number of observations; MN: mean; SD: standard deviations; VC: variation coefficient; Min: minimum; Q1: first quartile; Md: median; Q3: third quartile; Max: maximum.

Obs.: the total number of 361 debenture series in Panel B was issued by 131 companies. In Panel C, the 34 series in the open to the general public modality were issued by 28 companies; in the restricted efforts modality, the 327 series were issued by 127 companies. Twenty-four companies issued series in both debenture modalities.

Source: research data.

The sample contains companies with dispersed ownership and control, extremely concentrated companies, as well as companies that maintain divergence between voting rights and cash flow by issuing two classes of shares. Regarding the ownership structure, the average ownership of voting shares is 69.3% (min. 8.1% and max. 99.9%), against average ownership of 64.7% (min. 8.2% and max. 99.9%) held by the controlling shareholders, percentages similar to the median. The difference between control and ownership (excessive control) is, on average, 4.6%, but quite heterogeneous among the companies. Furthermore, when analyzing the concentration of control based on the values of the quartiles, it appears that defined control companies (approximately 75% of the sample) predominate in the sample, that is, they have one controlling shareholder, which has more than 50 % of the shares with voting rights. The proportion of voting rights is higher, for example, than that described in Crisóstomo et al. (2020). On average, it corresponds to 49% for the largest shareholder, 67% for the three largest shareholders, and 70% for the five largest shareholders in a sample of 85 companies with the highest market capitalization in the period from 2010 to 2013. The property structure averages are difficult to reconcile because they are subject to the extreme values of the sample, and even to certain specificities of the period included in the analysis (Andrade et al., 2014; Bortolon & Leal, 2014). In this specific case, despite representing the direct property, they do not refer strictly to the largest shareholder, but to the shareholders appointed as controlling shareholders, as explained in section 3.

According to the data in Panel C, there is a predominance of debentures issued in the form of restricted efforts, which account for 90.6% of the sample data. This predominance can be explained by the greater simplicity of requirements required in this modality, which is reflected in the lower cost of the issuing process. The most significant average differences in the descriptive statistics of these two modalities are that issues with restricted efforts make greater use of secured guarantee as a measure of protection for creditors and tend to come from smaller and less indebted companies. Regarding the cost of debt, the concentration of control, ownership, and excessive control are relatively similar, although there is heterogeneity in the variances of these variables between the two modalities.

The results of the regressions that were aimed at identifying the effect of the ownership structure on the cost of funding through the issue of debentures in Brazil are shown in Table 4. The three models incorporate the characteristics of the ownership structure and demonstrated general validity at a 99% confidence level. In addition, the assumptions of the OLS estimation method were met, indicating that the models were duly specified.

Among the property structure characteristics analyzed, only the concentration of direct control (Model 1) showed statistical significance (5%) and seems to be sufficiently relevant for creditors to influence the cost of debt.

Table 4

Results of OLS estimations
Model:

$$Spread_i = \alpha_i + \beta_1 Property\ structure_i + \beta_2 Size_i + \beta_3 Indebtedness_i + \beta_4 Profitability_i + \beta_5 Secured\ guarantee_i + \beta_6 Selic_t + \sum_{k=2011}^{2018} \delta_k Year_k + \varepsilon_i$$

Characteristic of property structure analyzed	Model 1 Direct control concentration		Model 2 Direct property concentration		Model 3 Difference between control and property rights (excessive control)	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Direct control concentration	0.011 (0.005)	0.021				
Direct control concentration ²	-0.001 (0.003)	0.020				
Direct property concentration			-0.0002 (0.001)	0.823		
Excessive control					0.07 (0.06)	0.24
Size	-0.15 (0.023)	0.001	-0.15 (0.02)	0.001	-0.15 (0.023)	0.001
Indebtedness	0.66 (0.18)	0.001	0.67 (0.18)	0.001	0.64 (0.18)	0.001
Secured guarantee	0.30 (0.073)	0.001	0.32 (0.073)	0.001	0.32 (0.07)	0.001
Selic	2.84 (2.72)	0.297	3.48 (2.72)	0.202	3.18 (2.72)	0.244
Profitability	-2.75 (0.66)	0.001	-2.84 (0.66)	0.001	-2.80 (0.65)	0.001
Constant	1.96 (0.48)	0.001	2.07 (0.49)	0.001	2.13 (0.47)	0.001
Fixed effect of the year	Yes		Yes		Yes	
Fixed effect of the sector	No		No		No	
F test (F)	15.0	0.00	15.6	0.000	15.7	0.00
Asymmetry and kurtosis test for normality of residues	3.66	0.16	5.33	0.07	5.5	0.07
Breusch-Pagan/Cook-Weisberg test for heteroscedasticity (χ^2)	0.6	0.44	0.17	0.68	0.12	0.73
R ²	0.38		0.37		0.37	
Adjusted R ²	0.35		0.34		0.35	
Observations	361		361		361	
Companies	131		131		131	

Obs.: the values between parentheses indicate the standard error of the estimated coefficients. The asymmetry and kurtosis test and the Breusch-Pagan/Cook-Weisberg test appointed, respectively, absence of normality problems of the residues and heteroscedasticity in the model at a 95% confidence level. The variance inflation factors appointed absence of multicollinearity, as the maximum in the three models was lower than 10. As the models presented no problems to comply with the linear regression premises, we chose to present the results with non-robust errors; nevertheless, when the same regressions are estimated with robust errors, the results remained stable. In the calculation of significance, two-tailed probability was considered.

Source: elaborated by the authors.

The results indicate that the concentration of control has a quadratic relationship with the cost of debt, that is; to some extent, creditors perceive the increase in the concentration of control as something negative, causing them to demand a higher remuneration in the supply of capital. As the concentration of control becomes very high, however, creditors start to see this as something beneficial, which is reflected in a lower spread charged in the supply of capital.

One of the possible factors that explain the reduction in the cost of debt as the concentration of control increases is the fact that this reduces the likelihood of a change in the company's control and its consequences for creditors. Changes in shareholding control tend to imply changes in companies' investment, financing, and dividend policies. Thus, when companies do not have a defined controller, other shareholders may take control of the company (takeover) and creditors may make undesirable changes along the lines of the discussion presented by Ashbaugh-Skaife et al. (2006) and Klock et al. (2005). Consequently, if undesirable changes by creditors occur, they might have to subject themselves to taking disproportionate risks ex post to those considered when contracting the debt. This reinforces the finding that the change of control is a sensitive issue for debt creditors in Brazil, in line with the findings by Konraht (2017), in that creditors for debentures in Brazil include, among the various covenants of the debt deed, provisions that prohibit changes in the company's shareholding control during the term of the debt, without such change being approved by the debenture holders' meeting. It is worth mentioning that, as noted in Table 2, the companies in the sample tend to resort, predominantly, to third-party capital. To maintain access to this source of financing, controlling shareholders may be more concerned with reputation and, consequently, with compliance with contractual clauses, similar to what was exposed in the previous literature, such as Ashbaugh-Skaife et al. (2006), Anderson et al. (2003) and Byun et al. (2013).

The concentration of ownership (Model 2) is not statistically significant to the extent of influencing variations in the debt spread. The alignment effect may not be an aspect that creditors consider relevant when pricing debt securities, at least in the Brazilian context, as the majority shareholders tend to get involved in the company's management. The argument that the difference between control and property rights increases the cost of debt (Model 3) was not statistically significant either. In the sample analyzed, the median of ownership concentration and control concentration variables are not significantly different, although the variation coefficient shows that companies are reasonably heterogeneous. This apparently contradicts the results reported by Konraht et al. (2016) for the Brazilian context. These authors use the ratio between financial expenses and the interest-bearing liability as a variable for the cost of debt though. The results presented in Table 3 refer to the cost of debt as the cost of issuing debentures. The specificities of debenture contracts and companies' use of these contracts can interfere with incentives, both for shareholders and creditors.

Finally, additional tests were carried out, re-estimating the same regressions of models 1, 2, and 3, with the segmentation of the sample by debenture issue modality: open to the general public and restricted efforts. In addition to this test, the replacement of the difference between control and ownership, calculated based on Cronqvist and Nilsson (2003), by other measures of the difference between voting rights and ownership was tested: (a) difference (subtraction) between the percentage of control and the percentage of ownership; and, (b) binary variable identifying the cases in which the percentage of control exceeds the percentage of ownership. The results found in these tests were consistent with those presented in Table 4, without changing the findings of the analysis.

5. Final considerations

This article presents evidence about the relationship between the ownership structure and the cost of debt, specifically in relation to debt leverage in Brazil. Two hypotheses were formulated based on theoretical predictions about the magnitude of the agency costs between shareholders and creditors. The first hypothesis predicts that excessive control would increase the cost of debt, assuming that debt costs increase as conflicts of interest between owners and creditors also increase. The results presented do not confirm that this occurs for the analyzed sample though. The creditors may have been able, for example, to incorporate the risk of variance of future cash flows into restrictive clauses and guarantees required in the issue of debentures, to make interest rates more appropriate. Thus, alignment between owners and managers and between owners may not be the creditors' core concern.

The second hypothesis predicted that the concentration of the direct property right (control) would reduce the cost of the debt. For the direct control concentration, the results were positive and significant; still, the quadratic relation shows that, as the concentration of control increases, this relation becomes negative. Therefore, it is interpreted that, to some extent, creditors perceive the increase in the concentration of control as something negative, causing them to demand a higher remuneration in the supply of capital; but as the concentration of control becomes quite high, creditors see this as beneficial, which is reflected in a lower spread charged on the provision of capital via the issue of debentures. As the results were not significant for the concentration of direct property, it is interpreted that, given the particular configuration of property in Brazil, creditors tend to attribute greater relevance to the risk of change in control than to the benefits generated by the alignment of interests deriving from the concentration of ownership.

The results show that the perception of debenture holders (debt holders) about the effect of the cost of debt on the company's value differs from that of the outsider shareholders, that is, the question of the alignment effect and the entrenchment effect. In Brazil, the majority shareholders are often the company managers or maintain a very close relationship with the company management. Perhaps, for creditors, a less than ideal decision is more pertinent than a change in risk. For example, as explained in Jiraporn et al. (2013), if management acts predominantly on behalf of the shareholders, it may start to sub-invest in a project of positive net present value, because the benefit would accumulate mainly for the debt holders.

Finally, given the methodological decisions made to execute the research, the results come with some limitations. First, the results obtained are limited to the sample of debenture series analyzed, as the analysis of the cost of debt included only the series of debentures that use remuneration in the DI rate format plus a fixed percentage rate, as detailed in section 3. Each debenture issue contract tends to have many specificities, which were not addressed in the analysis of the grouped data. Another limitation is that the ownership and control structure can also be analyzed from other perspectives. For example, the identity of the controlling shareholder can be considered, in which the literature appoints a difference in the perception of the firm's value when the control is individual or family, state, institutional, national or foreign, for example. In addition, as the analysis is developed for direct shareholding, future research could consider pyramidal shareholdings, that is, indirect shareholdings that tend to demonstrate a concentration of control where apparently there would not exist any. Finally, the analysis is not conducted for other forms of corporate financing, which are sometimes used concurrently with financing by debentures, such as bank loans and intragroup loans. The results of this research can be further refined, simultaneously taking into account the cost of other sources of financing, the identity of the controlling shareholder and even characteristics of the board of directors.

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