

The Effect of Ownership Structure on the Yield Spread of Corporate Bonds

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Abstract

In the recent recession scenario in Brazil, the credit market experienced shortages, reinforcing the search for alternative sources of credit by companies, such as the issuance of corporate bonds. Among the aspects that may influence the yield spread of companies is the presence of family firms and institutional investors in their ownership structure. Therefore, this study aims at verifying whether the participation of family firms and institutional investors—in the ownership structure of companies—has an impact on the yield spread of their bonds. To verify this impact, this study analyzes 171 companies that carried out 385 bond issuances, from 2010 to 2018. The effects of ownership structure are tested by descriptive statistics, correlation analysis and multiple cross section regression with pooled data. The result shows that the greater the participation of institutional investors in the companies' ownership structure, the lower the yield spread of their bonds.

Keywords

Yield Spread, Corporate Bonds, Family Firms, Institutional Investors

1. Introduction

Studies pose that there is a direct relationship between bond-yield spread and the real economy. Understanding whether this relationship continues in times of recession is especially important, not only for policy makers, but also for corporate financing decisions (Karlsson & Österholm, 2020).

Recently, Brazil has gone through a recession. According to the Central Bank of Brazil (Bacen, 2020a), there was a drop in the Gross Domestic Product (GDP), starting in 2014, with the following real rates of change: 3% in 2013, 0.50% in 2014, -3.55% in 2015, -3.46% in 2016, 0.99% in 2017 and 1.1% in 2018. Ratify-

ing this scenario, the National Bank for Economic and Social Development (BNDES) receives fewer funds from the National Treasury and ceases to be a lead player in the credit market, making room for the resumption of funding through the capital market. It now prioritizes small and medium-sized enterprises, thereby forcing large organizations to turn their attention to investors, since they need large amounts of resources for their investment decisions (Brant, 2018).

Additionally, during the same period, there was an increase in the basic interest rate of the economy (known as the Selic rate)—9.90% in 2013, 11.65% in 2014, 14.15% in 2015, 13.65% in 2016, 6.90% in 2017, and 6.50% in 2018—which further increased the interest rates and spreads charged by the companies' banks, respectively: 15.63% and 7.48% in 2013, 16.56% and 8.03% in 2014, 20.71% and 9.63% in 2015, 20.13% and 10.79% in 2016, 16.85% and 9.83% in 2017, and 6.40% and 8.23% in 2018 (Bacen, 2020b, 2020c). This fact reinforces the search for alternative sources of credit by companies. However, it is important to note that the interest rates paid to investors by debt security issuers vary according to the risk they offer, innovations in firm-specific and macroeconomic fundamentals (Bhojraj & Sengupta, 2003; Friewald & Nagler, 2019).

The impact of corporate risk on the return of their debt securities has long been researched by the academy (Fisher, 1959; Cohen, 1962; Horrigan, 1966; Kaplan & Urwitz, 1979; Weinstein, 1981). The interest rate of this financial instrument is important for both investors and issuers. For companies, the interest rate affects their structure and cost of capital, as well as their investment decisions. For investors, it affects the profitability and dynamics of the investment portfolio.

The interest rate of a debt security consists of a basic or risk-free interest rate, and a yield spread that represents a premium for the various specific risks to each security. One of the main components of this spread is the compensation of the default risk. In the market, the result of this default risk assessment is called a rating. The rating incorporates the business risk (sector, market share, competitiveness, professional management), the segment risk (industrial, commercial or services) and financial risk (financial policy, taxation, profitability, cash flows and capital structure) inherent to the cycle of the debt securities analyzed (Altman et al., 1998).

Among the various types of family firms are those that constitute family groups, as well as institutional investors. Family firms have fewer agency conflicts, since owners and managers are the same person, which encourages the maximization of wealth. They also aim at preserving their affective endowment, known as social emotional wealth (Munoz-Bullon et al., 2018). This suggests that bondholders consider family ownership as an organizational structure that better protects their interests and also reduces the conflict between owners and creditors (Anderson et al., 2003). Besides, greater commitment and identification are expected by owners with large families, since a high shareholding in-

increases the family's ability to influence corporate decisions through the unrestricted exercise of personal authority (Castro et al., 2017). Family ownership may use its management and governance capabilities to positively impact the company's performance (Espinosa-Méndez et al., 2018).

If the dual role of owner and manager of the same family member promotes an efficient corporate governance structure, this leads to a reduction in the yield spread of its bonds. On the other hand, this situation may produce an increase in the informational asymmetry among owners, managers and creditors, negatively impacting the company's performance. Moreover, the existence of a concentration of ownership may create another agency conflict—between dominant and minority shareholders. In this case, rating agencies assign lower scores to the bonds issued by the family firm, which leads to a higher yield spread (Ashbaugh-Skaife et al., 2006; Martínez & Requejo, 2016).

In turn, Bhojraj and Sengupta (2003) affirm that the monitoring of institutional investors assists in managing the companies, which causes a more stable financial performance in the investees. Large institutional investors are more motivated and better able to monitor the management. Thus, concentrated institutional ownership strengthens shareholder control and aligns management's interests (Zhang & Zhou, 2018). Institutional investors contribute to the capital market development by stimulating efficient transactions, sound risk evaluation and a better corporate governance system (Jara et al., 2019; Saona & Tenderini, 2019). These factors lead to the identification of a positive relationship between the stakes of institutional investors in the share capital of the companies, also reducing the yield spread of their debt securities. Kim, Kim, Mantecon, and Song (2019) find that the investment horizons of institutional investors are negatively correlated with the number of loan covenants and spreads.

In this study, the definition of the Accounting Pronouncements Committee (CPC) No. 18 (Committee of Accounting Pronouncements, 2012) was chosen for identifying the control of companies. This very definition is used in the studies by Siqueira (1998) and Rogers et al. (2007). Controllers are those shareholders who hold more than 50% of the common shares (directly or indirectly) or who hold between 20% and 50% of the voting capital, which characterizes a significant influence on the company.

In light of the foregoing, there is the following research question: does the participation of family firms and institutional investors—in the ownership structure of companies—have an impact on the yield spread of their bonds? In order to meet the objective of studying this issue, the following hypotheses are defined: H1: The participation of families in the ownership structure of companies impacts the yield spread of their bonds; and H2: The greater the participation of institutional investors in the ownership structure of the companies, the lower the yield spread of their bonds.

This study is organized as follows—Section 2 presents the literature review and the hypotheses associated with the research objective. Section 3 contains the

description of the data sample and the methodology applied to verify the hypotheses. In Section 4, the results of the tests are presented. Finally, Section 5 reports the conclusion of the paper.

2. Literature Review

According to [Jensen and Meckling \(1976\)](#), companies are a set of contracts in which one party—the principal—delegates the decision-making responsibility to a second party—the agent or manager. The latter should represent the company in serving its interests—wealth creation or long-term profit maximization. It occurs that agents may not act in the principal's best interests, prioritizing their personal interests or usefulness.

This way, there is a possibility of conflicts between principal and agents. An example of this is the problem of free cash flows, which occurs when the company has surplus financial resources, with few investment opportunities. In this case, agents or managers tend to invest in alternatives with negative NPV ([Jensen, 1986](#)).

To mitigate this conflict and maximize shareholder wealth, companies incur costs related to monitoring their administrators' actions, remuneration policies for their executives and company's indebtedness, among other actions, as follow:

1) Monitoring: This resource can be used to measure managers' efforts and actions. When necessary, there may be intervention by the owners. Monitoring can prevent the most obvious costs, such as the compensation policy expenditures ([Wright et al., 2007](#)).

2) Managers' remuneration: Because monitoring is imperfect, remuneration plans are designed to attract competent managers and give them appropriate incentives. Companies link part of their payment to executives, for the performance obtained in the stock prices. This remuneration is generally granted in one of three ways: stock options, restricted shares (granted to employees in order to align their interests with those of the company, with effective payment linked to their permanence), or performance shares (granted to an executive when certain long-term goals are met). Stock options are the most widely used and give the manager the right to buy the company's stocks at a predetermined strike price ([Brealey et al., 2016](#)).

3) Corporate indebtedness: For [Jensen \(1986\)](#), more profitable companies have high cash flow and, consequently, greater agency problems. This is because the higher the free cash flow, the greater the chance that managers—with little or no stake in the company's capital—will use these resources for their own benefit or apply them to projects with lower returns. Thus, the greater the company's indebtedness, the lower the cash flow available to the manager, which forces him or her to make better investment decisions.

4) Hostile acquisition: This occurs when a company A wishes to acquire control of a company B, without any negotiation with the managers of company B. Generally, this is due to a mismanagement of company B, which encourages the

perception of greater gains based on the best management by the executives of company A. According to [Stulz \(1988\)](#), managers' preference for control may force potential acquirers to offer higher premiums. This fact occurs especially in those firms whose managers have a higher percentage of shares. However, when institutional investors participate in company's ownership, it is better managed. Thus, in this case, the chance of a successful hostile takeover is greatly reduced.

Another type of agency conflict occurs between shareholders and creditors when the company is in financial distress. This situation often causes shareholders to adopt selfish strategies, harming creditors for their own benefit. These strategies entail costs, since they reduce the market value of the company as a whole.

For [Harris and Raviv \(1991\)](#), this type of conflict arises when debt contracting gives the shareholder an incentive to invest in a less-than-optimal way. If these investments produce a large return, shareholders receive most of the return. However, if the investment fails, because of limited liability, the creditors take the consequences. Therefore, shareholders are tempted to invest in very risky projects. For [Weiss and Stiglitz \(1981\)](#), with the market imperfection and the existing information asymmetry, creditors are permanently exposed to problems of adverse selection and moral hazard. These problems limit creditors' ability of identifying the agents most likely to repay their capital.

According to [Bhojraj and Sengupta \(2003\)](#), ownership structure has a significant impact on the yield spread of a company's bonds. [Shleifer and Vishny \(1997\)](#) and [Brickley et al. \(1988\)](#) argue that, among investors who hold more than 5% of a company's share capital, the role of institutional investors stands out. For the authors, an institutional investor is an institution investing in the capital market.

For [Monks and Minow \(1995\)](#), [Shleifer and Vishny \(1997\)](#), [Brickley et al. \(1988\)](#), and [Bhojraj and Sengupta \(2003\)](#), institutional investors have an active stance regarding the management of publicly-held companies in which they are shareholders. Assuming that they have a considerable percentage of a company's shares, their incentive to monitor or control the executives outweighs the costs associated with this task, even if other investors benefit as well.

[Morck et al. \(1988\)](#) argue that institutional investors, due to their large shareholdings, have incentives to monitor corporate performance, since they may benefit more from this and enjoy greater voting power, which facilitates corrective actions, when necessary. [McConnell and Servaes \(1990\)](#) find a positive relationship between institutional investors and productivity, measured by Tobin's Q ratio. [Bhojraj and Sengupta \(2003\)](#) and [Cremers, Nair and Wei \(2007\)](#) confirm the benefits of institutional investor's participation in the company's ownership structure, although stating that it has a significant negative impact on its yield spread (H2).

Additionally, seminal studies by [Jensen and Meckling \(1976\)](#) and [Fama and Jensen \(1983\)](#) show that the shareholder's agency costs are null or negligible,

when there are an ownership concentration and an ownership and management overlap. This means that the family, with great voting rights and the right to future cash flows, has greater incentive and motivation not only to monitor the actions of managers but also to increase the company's value.

This fact stems from the competition between the capital risk and the effective management of the company, which allows the managers' attitudes to be aligned with the growth opportunities and the risk they face when exploiting these opportunities. Accordingly, there is a decrease in monitoring costs and incentives aimed at improving the performance of companies. It is in this perspective that [Fama and Jensen \(1983\)](#) argue that the owner-manager can replace the costly control mechanisms used in large companies, to mitigate agency problems between the principal and the agent.

On the other hand, authors such as [Ashbaugh-Skaife et al. \(2006\)](#) understand that family firm constitutes a fertile ground for family tensions and conflicts—different views on ownership distribution, risk compensation, succession processes, power sharing and power disputes can make the company a battlefield, where family members compete against one another, distorting the organization's mission and objectives. These facts indicate that the participation of families in the ownership structure of companies impacts the yield spread of their bonds, either positively or negatively (H1).

According to [Akerlof \(1970\)](#), informational asymmetry occurs when there are transactions in which one of the parties (agents or managers) holds information quantitatively or qualitatively superior to the other parties involved (principal or shareholders). For [Brigham and Ehrhardt \(2012\)](#), there is informational asymmetry when investors, and other agents outside the corporation, have less information than managers, who work in-house. [Ghani et al. \(2015\)](#) show that, reducing the transparency of companies' information deteriorates the corporate performance. In this case, they have greater difficulty in obtaining financial credit and negotiating their shares to make their investments. In other words, the higher the information asymmetry, the more restricted the external sources of capital fundraising and the implementation of operational investments.

The information that companies have about investment opportunities, suppliers or competitors is essential for decision making. Thus, it needs to be prioritized by the company. The situations in which owners distance themselves from the control of companies make them no longer follow all available information. In this case, control is performed by external persons, hired for this specific purpose.

According to [Faccio et al. \(2001\)](#) and [Chae and Oh \(2016\)](#), family firms are those in which a family member holds a key position as chief executive officer or chairman of the board of directors. Also, the family owns more than 5% of the company's capital. For them, the existence of a family member as a manager and owner may mitigate the agency conflict and consequently its cost, which positively impacts the company's bottom line. The founding families of companies

represent a special class of large shareholders who have incentive structures, a strong voice in the company, and powerful motives for managing a particular enterprise (Anderson et al., 2003; Chae & Oh, 2016).

In the case of companies having family members in their management and ownership, according to Ashbaugh-Skaife et al. (2006), this duplicity of corporate roles may not characterize the best governance practices. This situation produces an increase in the informational asymmetry among owners, managers and creditors, negatively impacting the company's performance. In this case, credit rating agencies may assign lower scores to the bonds issued by family firms, which leads to a higher yield spread.

However, for Shleifer and Vishny (1997), Brickley et al. (1988), Faccio et al. (2001), Bhojraj and Sengupta (2003), and Chae and Oh (2016), both family firms and institutional investors play a role in corporate governance by contributing to the reduction of informational asymmetry among shareholders, managers and creditors. In this study, the presence of both ownership structures is considered as contributing to the reduction of informational asymmetry and yield spread of the companies' debt securities (H1 and H2).

Brazilian capital market is an important source of funds for companies. It meets the needs of long-term projects, such as infrastructure, while offering attractive and diversified investment opportunities to optimize the risk-return ratio of the investors' portfolios. A robust capital market reduces dependence on bank credit and can act as a stabilizing element in times of crisis. Despite its still low liquidity levels, it is possible to state that the Brazilian corporate bond market has become more liquid since 2017, corresponding to more than 60% the total capital market. The largest institutional investors of corporate bonds in Brazil are large banks, insurance companies, pension and private equity funds.

Table 1 presents a summary of the empirical studies related to the theme of this paper. In all of them, the dependent variable is the bond yield spread. Bagnani et al. (1994) examine the participation of families that actually work in the management of the company in relation to the yield spread of corporate bonds. The database used is Invest Data Corporation with securities listed in the American Bond Exchanges. The final sample consists of 140 companies with 614 annual observations, between 1977 and 1985. The authors identify a positive and significant relationship between family firms and return premiums, considering a stake ranging from 5 to 25%. They argue that, the greater the stake of family firms in the corporate ownership, the greater the risk aversion in their investment decisions.

Anderson et al. (2003) study the impact of family firms on the agency cost of securities issued. They use the Lehman Brothers Bond database and the S&P 500 Industrial Index. The sample is made up of 252 non-financial firms, with 1,052 observations, from 1993 to 1998. Researchers find results consistent with the idea that founding family firms have incentive structures resulting in less agency conflicts between shareholders and creditors. This suggests that bondholders see

Table 1. Summary of empirical studies

AC	VT	TH	ES	Bagnani et al. (1994)		Anderson et al. (2003)		Bhojraj & Sengupta (2003)		Klock et al. (2005)		Cremers et al. (2007)		Boubakri & Ghouma (2010)	
				Sign	Sig.	Sign	Sig.	Sign	Sig.	Sign	Sig.	Sign	Sig.	Sign	Sig.
FAM	I	AG	-/+	+	5%	-	1%	NA	NA	NA	NA	NA	NA	-	NS
		AS	-/+					NA	NA	NA	NA	NA	NA	NA	NA
INST	I	AG	-	NA	NA	NA	NA	-	NS	-	1%	-	1%	NA	NA
		AS	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOL	C	(a)	-	NA	NA	NA	NA	-	5%	NA	NA	NA	NA	NA	NA
GAR	C	(a)	+	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INCT	C	(a)	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PUB	C	(a)	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEV	C	(a)	+	NA	NA	+	NS	+	1%	+	1%	+	1%	+	5%
ROA	C	(a)	-	+	NS	-	1%	-	1%	-	1%	-	1%	-	5%

Notes: NS: not significant; NA—not applicable; AC—Acronym; VT—Variable type; TH—Theories; ES—Expected sign; FAM—Family firm; INST—Institutional investors; VOL—Financial volume; GAR—Guarantees; INCT—Incentivized bonds; PUB—Publicly-held companies; LEV—Leverage; ROA—Return on assets; AG—Agency; AS—Asymmetry; I—Independent; C—Control; (a) The expected signs of the control variables, in relation to the yield spread, are supported and justified by the aforementioned empirical studies.

family ownership as an organizational structure that best protects their interests. Family firms have a negative and significant relation with the yield spread of companies.

Bhojraj & Sengupta (2003) analyze the effect of institutional investors on the yield spread of companies, from 1991 to 1996. The database used is the Warga Fixed Income, which belongs to the Lehman Brothers investment bank. The final sample consists of 1005 observations. The results show a negative and significant relationship between institutional investors and companies' bond yields.

Klock et al. (2005) examine the relationship between the cost of yield spread and the participation of institutional investors in the ownership structure. The searched databases are Lehman Brothers Fixed Income (LBFI), Investor Responsibility Research Center (IRRC), Compustat, Thomson Financial Institutional Ownership, and Mergent's Bond Record for the year 2000. In all, 1877 observations are analyzed for 678 companies, in the years 1990, 1993, 1995, 1998, and 2000. Researchers find a statistically significant negative relationship between institutional investors and yield spread.

Cremers et al. (2007) assess the effects of governance mechanisms, such as the presence of institutional investors on the yield spread of companies for bondholders, from 1990 to 1997. They use the Lehman Brothers Bond database to obtain a sample of 1218 bonds of 299 companies. As a result, the researchers conclude that the presence of institutional investors in the ownership structure has a negative relationship with the yield spread of the companies.

Finally, Boubakri and Ghouma (2010) find a negative relationship—with no

statistical significance—between family firm and the yield spread of the debts of companies in Western Europe and East Asia. More than 800 companies from 22 countries are selected from the Fixed Investment Securities database, between 1994 and 2002.

In light of the above, the studies by [Bagnani et al. \(1994\)](#) and [Anderson et al. \(2003\)](#) seem to confirm H1, since the positive and negative results are significant—the participation of families in the ownership structure of companies impacts the yield spread of their bonds. On the other hand, [Klock et al. \(2005\)](#) and [Cremers et al. \(2007\)](#) corroborate H2—the greater the participation of institutional investor in the ownership structure of companies, the lower the yield spread of their bonds. Regarding the control variables, they find empirical support for their application in the regression model shown in Section 3—Methodology. Finally, highlighted is the fact that Brazilian studies do not identify a relationship between ownership structure—which considers family firm and institutional investors—and yield spread, which reinforces the relevance of this study.

3. Methodology

The population of interest in this study refers to Brazilian non-financial companies, whether publicly-held or privately-held companies, issuing corporate bonds indexed to the Broad Consumer Price Index (IPCA)—equivalent to Consumer Price Index (CPI) in the United States—and Interbank Deposit rate (DI). Financial institutions do not issue corporate bonds, so they are excluded from the sample. Initial sample consists of 183 companies and 409 corporate bonds. 12 companies and 24 corporate bonds are excluded since they have negative or zero yield spreads. Thus, final sample consists of 171 companies that issued 385 corporate bonds, from 2010 to 2018. Company data are obtained from the following sources: a) corporate bond characteristics—Bloomberg, and b) ownership structure data, in which family firms and institutional investors participate—Valor Grandes Grupos yearbook and Valor PRO—Economic Value Newspaper and Securities and Exchange Commission of Brazil (SECB).

The effects of ownership structure are tested by descriptive statistics, correlation analysis and multiple cross-section regression with pooled data. The formula for the dependent variable yield spread of corporate bonds is similar to the one used by [Paiva \(2011\)](#). The corporate bond spread—indexed to IPCA—is calculated by the ratio between the corporate bond yield and the one of National Treasury Bond Series B (NTN-B)—see Equation (1).

$$\text{Spread} = \left[\frac{(1 + y_b)}{(1 + y_t)} \right] - 1 \quad (1)$$

In which:

y_b : yield of the corporate bond;

y_t : yield of the National Treasury Bond Series B (NTN-B).

Moreover, the corporate bond spread of DI + rate is calculated considering Treasury Financial Bills (LFT) indexed to the Selic rate—see Equation (2).

$$\text{Spread} = \left[\frac{((1 + y_b) * (1 + \text{DI}))}{((1 + y_t) * (1 + \text{Selic}))} \right] - 1 \quad (2)$$

In which:

y_b : yield of the corporate bond;

y_t : yield of the Treasury Financial Bills (LFT), equivalent to the premium or discount;

DI: accumulated interbank deposit rate in the period;

Selic: accumulated Selic rate in the period.

Despite of being references in the overnight market, DI and Selic rates are not the same. The DI rate is systematically lower than the Selic rate. This is due to the fact that, in Brazil, DI is the main benchmark for capital market portfolios and banks' bond. Therefore, in order to eliminate this discrepancy, a differential rate measure is incorporated—see Equation (3).

$$(1 + \text{dif}) = \left[\frac{(1 + \text{DI}_{\text{OYR}})}{(1 + \text{Selic}_{\text{OYR}})} \right] \quad (3)$$

In which:

dif: overnight-year differential rate;

DI_{OYR} : overnight-year DI rate;

$\text{Selic}_{\text{OYR}}$: overnight-year Selic rate.

Thus, the corporate bond spread at DI + rate is obtained according to Equation (4):

$$\text{Spread} = \left[\left[\frac{(1 + y_b)}{(1 + y_t)} \right] * (1 + \text{dif})^{\text{wd}/252} \right] - 1 \quad (4)$$

In which:

y_b : yield of the corporate bond;

y_t : yield of the Treasury Financial Bills (LFT), equivalent to the premium or discount;

dif: overnight-year differential rate;

wd: working days.

Besides, for the corporate bonds with yield spread obtained by a percentage of DI, the first step is to transform this measure into equivalent yield, based on the DI x PRE swap rate for same-term operations—see Equation (5).

$$(1 + Y_{eq}) = \left\{ \left(1 + \left[(1 + \text{PRE})^{1/252} - 1 \right] * p \right) / (1 + \text{PRE})^{1/252} \right\}^{252} - 1 \quad (5)$$

In which:

Y_{eq} : annual yield equivalent to the DI percentage;

PRE: DI x PRE swap rate;

p : DI percentage.

The equivalent yield obtained in Equation (5) is applied to the same formula as Equation (2), used for corporate bond spread at DI + rate.

On the other hand, the family firm (FAM) and institutional investors (INST) independent variables are obtained by means of the percentage of the stake of these shareholders in the total number of the company's common shares in cir-

culatation. The companies of the sample have a minimum of 20% of their shares belonging to FAM or INST. Finally, the control variables are calculated as follows: issuance financial volume (VOL)—natural logarithm of issuance financial volume; issuance guarantees (GAR), incentive issuances (INCT) and publicly-held companies (PUBL)—dummies with a value equal to 1, if it presents the characteristic analyzed; financial leverage (LEV)—ratio between total debt (short and long-term) and total assets; return on assets (ROA)—ratio between Ebit and total assets.

Equations (6) and (7) present the econometric cross-section regression models, considered in the analysis of the hypotheses of this study.

$$YS_i = \alpha + \beta_1 FAM_i + \beta_2 VOL_i + \beta_3 GAR_i + \beta_4 INCT_i + \beta_5 PUBL_i + \beta_6 LEV_i + \beta_7 ROA_i + \varepsilon_i \quad (6)$$

$$YS_i = \alpha + \beta_1 INST_i + \beta_2 VOL_i + \beta_3 GAR_i + \beta_4 INCT_i + \beta_5 PUBL_i + \beta_6 LEV_i + \beta_7 ROA_i + \varepsilon_i \quad (7)$$

In which:

α is the linear coefficient;

β is the angular coefficient;

i is the company;

ε is the error term.

4. Results

Table 2 presents the descriptive statistics of the variables in the econometric models of Equations (6) and (7), except for the dummies of guarantees, incentive issuances, and publicly-held companies. Regarding the yield spread dependent variable, the mean value of 3.62% and the standard deviation of 4.4% are highlighted. The maximum value of 35.5% shows that there are issuances with a risk premium of 35.5% per annum, in relation to indexed public bonds. On the other hand, some issuances do not present a risk premium, remunerating the corporate bondholder in the same way as the public bond.

Regarding the independent variables, 116 observations stand out for family

Table 2. Descriptive statistics.

Variable	Remarks	Mean	Standard deviation	Minimum	Maximum
YS	385	0.036192	0.044040	0.000	0.355
FAM	116	0.522235	0.246897	0.213	1.000
INST	107	0.482458	0.257625	0.200	1.000
VOL	385	4.954878	0.929344	1.301	8.663
LEV	385	0.370725	0.237774	0.000	2.030
ROA	385	0.080584	0.096741	-0.312	0.653

firm, corresponding to 30.1% of the sample, or 116 out of 385 the issuances of this study. Moreover, institutional investors correspond to 28% of the sample, or 107 out of the 385 issuances in this study. The average stake of these investors in the ownership structure of companies is 48%, while the family firms' shares correspond to 52.2%. In both cases, their participation in ownership structure may reach 100%.

Concerning the financial volume control variable, its evolution in dollars should be noted as it accompanies the number of issuances during the sample period, namely 2 (2010), 7 (2011), 19 (2012), 39 (2013), 34 (2014), 30 (2015), 25 (2016), 74 (2017), and 155 (2018), totaling 385 corporate bond issuances. There is a lower volume for the years 2010 and 2011. When approving Incentive Law 12.431/2011, which grants special income tax rates, starting in 2012, this value increased three times (IPEA, 2015). In 2016, there is an additional decline, due to the adverse economic scenario, observed in the year 2015 (Meibak, 2016). In 2017 and 2018, facing the scant credit offered by the BNDES, companies resumed funding through the capital market (Brant, 2018).

With respect to the leverage and return on assets variables, the average leverage of 37.1% of the sample companies and an average return on assets of 8.05% stand out. Also worth mentioning is that some of the companies in the sample have an indebtedness level of 203%, showing the third-parties' capital as the main funding source to make their investments.

In turn, the correlation analysis aims at evaluating: 1) the degree and the meaning of the relationship between the independent and control variables with the dependent variable, which helps verify the hypotheses of this paper; and 2) the existence of a possible multicollinearity between the independent and control variables, to be proven by testing the assumptions of the static regression models.

Table 3 presents the results of the correlation analysis. In relation to the first hypothesis, the control variables with sign in accordance with the theory and statistical significance are: guarantees, incentive bonds, leverage and return on assets. About the second hypothesis, the independent variables family firms and institutional investors should be highlighted as having no statistical significance. Moreover, also important to mention is that there is high (above 40%) negative relation between family firms and institutional investor, as well as between publicly-held companies and family firms, and guarantees and incentive bonds.

Finally, the objective of cross-section regression tests is to provide an explanatory model of the relationship between the yield spread dependent variable and the independent and control variables. Thus, two regression models are generated, of which model 1 is represented by Equation (6), and model 2 is represented by Equation (7). For the sample results to be inferred for the population, it is necessary to test their assumptions, namely: 1) normality of residues, 2) homoscedasticity of residues, 3) linearities of coefficients, and 4) absence of high multicollinearity among explanatory variables.

Table 3. Correlation analysis.

	YS	FAM	INST	VOL	GAR	INCT	PUBL	LEV	ROA
FAM	-0.0714 [0.4463]	1000							
INST	-0.0286 [0.7698]	-0.4727 [0.0410]	1000						
VOL	0.1527 [0.0027]	-0.0489 [0.6020]	-0.0366 [0.7082]	1000					
GAR	0.1117 [0.0284]	0.2731 [0.0030]	0.3699 [0.0001]	-0.0818 [0.1092]	.000				
INCT	-0.3072 [0.0000]	0.3009 [0.0010]	-0.0792 [0.4172]	0.0463 [0.3654]	0.2888 [0.0000]	1000			
PUBL	0.2764 [0.0000]	-0.4203 [0.0000]	0.0581 [0.5521]	0.1102 [0.0307]	-0.5396 [0.0000]	-0.5038 [0.0000]	1000		
LEV	0.1662 [0.0011]	0.0717 [0.4446]	0.1517 [0.1189]	0.0289 [0.5724]	0.1304 [0.0105]	0.0177 [0.7294]	-0.0603 [0.2375]	1000	
ROA	-0.2517 [0.0000]	-0.1580 [0.0904]	0.1402 [0.1497]	-0.0086 [0.8658]	-0.3140 [0.0000]	-0.0515 [0.3134]	0.0967 [0.0580]	0.1455 [0.0042]	1000

Note: The values on the top refer to the correlation coefficients, while the values on the bottom, in brackets, are the p-values or significance levels of the coefficients. The null hypothesis is that the correlation is equal to zero. As for the values highlighted in bold, they are the ones with the highest degree of correlation, above 40%.

The results of the tests of the assumptions are: 1) normality of the residues: the Shapiro-Wilk test indicates rejection of the null hypothesis in both models, i.e., the residues are not normal. However, according to the Gauss-Markov theorem, even if there is no normality, the Ordinary Least Squares (OLS) estimators are the best unbiased linear estimators (Wooldridge, 2016); 2) homoscedasticity of the residues: the results of the tests indicate heteroscedasticity of residues only in the model of Equations (6) and (7). Correction occurs through robust errors—variance covariance of the estimator (VCE); 3) linearities of the coefficients: the parameter test analyzes whether the coefficients of the independent and control variables, together, are equal to or different from zero. As a result, they are statistically different from zero, which characterizes the linearity of the coefficients for the three models; and 4) absence of high multicollinearity among the explanatory variables: this is tested through the Variance Inflation Factor (VIF), whose values for the two models are 1.74 and 1.25, respectively, all being less than 5 (Wooldridge, 2016). Therefore, the conclusion is that there is no significant multicollinearity between the independent and control variables.

Table 4 shows the results of the regression models of Equations (6) and (7). Both Models 1 and 2 present statistical significance ($F = 0.0000$). However, Model 2 has greater explanatory power ($R^2 = 0.4311$). As for the independent variables, Model 2 presents adequacy to the expected sign and statistical significance of institutional investors. This result corroborates hypothesis H2—the greater the participation of institutional investors in the ownership structure of

Table 4. Multiple cross-section regression with stacked data.

Variables	Expected sign	Model 1	Model 2
No. of observations		116	107
FAM	+/-	0.009935 [0.326]	n/a
INST	-	n/a	-0.026823 [0.011]
VOL	-	-0.005287 [0.011]	-0.006551 [0.067]
GAR	+	0.007687 [0.272]	0.024210 [0.000]
INCT	-	-0.001095 [0.821]	-0.017073 [0.000]
PUBL	-	0.029748 [0.000]	0.037067 [0.000]
LEV	+	-0.004913 [0.564]	0.011129 [0.363]
ROA	-	0.007862 [0.717]	-0.038007 [0.147]
CONS		0.038854 [0.008]	0.054590 [0.003]
F		(7.108) = 12.80	(7.99) = 10.29
Prob > F		0.0000	0.0000
R ²		0.2268	0.4311

Note: The values between [brackets] represent the level of statistical significance of the relation. The values highlighted in bold indicate the statistical significance of the coefficient. Besides, n/a means not applicable.

companies, the lower the yield spread of their bonds. Moreover, the coefficient of -0.026 indicates that, for each 1% increase in the ownership structure with this type of investor, the company's yield spread decreases by 0.026%. This result corroborates the fact that institutional investors are the main demanders in the offer of corporate bonds since 2017.

With regard of Model 1, there is no statistical significance of the family firm coefficient, so that H1 cannot be confirmed: The participation of families in the companies' ownership structure impacts the yield spread of their bonds.

Concerning the control variables, Model 2 also presents statistically more significant coefficients, as well as their relation signs with the yield spread dependent variable, according to the financial theory—financial volume, guarantees and incentive issuances. About the financial volume, its coefficients in Models 1 and 2 are similar. For Model 2, the coefficient of -0.006 of the financial volume means that, an increase will reduce the company's yield spread by 0.6%. Besides, the coefficient of 0.024 (-0.017) of guarantees (incentive issuances) means that, whenever the dummy variable is equal to 1, there will be an increase (decrease) of 0.024% (-0.017%) in the yield spread of the company.

A priori, the existence of guarantees should promote a reduction in the debt spread. However, according to John et al. (2003), agency conflicts between managers and creditors cause an increase in the spread of corporate bonds. These conflicts are not considered in the process of assigning ratings to the issuances. Thus, the existence of bonds with guarantees signals to the market a higher level of risk. In turn, the incentive bonds variable—has the aim at financ-

ing infrastructure projects.

Publicly-held companies present statistical significance and positive relation with the yield spread, in Models 1 and 2. However, the sign is opposed to what is expected. The regression coefficient shows that, if the company is publicly-held, there is an increase of 0.029% (0.029) and 0.037% (0.037) in the issuance yield spread in Models 1 and 2, respectively.

Moreover, in a regression equation, an explanatory variable is endogenous, if it is correlated with the error or the disturbance term (ϵ). Empirical econometrics, although still related to traditional definitions, has evolved to describe endogeneity as any situation in which an explanatory variable is correlated with the error term. In applied econometrics, endogeneity usually appears in one of the three ways: omitted variables, measurement error and simultaneity (Wooldridge, 2010).

There are many ways to motivate tests to determine whether some explanatory variables are endogenous. If the null hypothesis is that all explanatory variables are exogenous, but one or more may be endogenous under the alternative, then the test can be based on the difference between the Two-Stage Least Squares (2SLS) and OLS estimators, provided that there are sufficient exogenous instruments to identify the parameters by 2SLS (Wooldridge, 2010).

To address the potential endogeneity of family firms and institutional investors' participation in the corporate ownership structure, the Big 4 instrumental variable is considered. This dummy variable is equal to 1, if the four largest international independent companies, PricewaterhouseCoopers (PwC), Ernst & Young (EY), Deloitte and KPMG, have audited the sample firms of this study.

The Big 4 firms may be more likely to ensure transparency and eliminate errors in a firm's financial statements, because they are more independent than local firms, or because they face greater legal liability for making mistakes. Additionally, even in cases in which the actual disclosure quality is not high, the Big 4 auditors can offer higher perceived disclosure quality and alleviate investors' fears, because of their prominent and respectful names—they have a greater reputation to be preserved (Dye, 1993; Michaely & Shaw, 1995; Mitton, 2002).

The Durbin-Wu-Hausman test was applied to verify the null hypothesis of exogeneity. For this, a 2SLS model was run, in which the Big 4 is the instrumental variable for family firms and institutional investors. The results points to a p-value of 0.1510 and 0.3186, respectively, accepting the null hypothesis that both independent variables are exogenous.

5. Conclusion

Brazil has a high participation of institutional investors and family firms in the ownership structure of listed companies, which intend to raise funds through corporate bonds issuances (B3, 2020; SECB, 2020). In addition, more recently, the BNDES has ceased to be a major player in the credit market, given the economic recession, opening up even more space for indebtedness of companies

through capital markets (Brant, 2018).

Thus, the purpose of this study is to understand whether the ownership structure—with the participation of family firms and institutional investors—alters the premium paid for risk or the yield spread of bond issuances. The hypotheses arising from this aim are as follow: H1: The participation of families in the ownership structure of companies impacts the yield spread of their bonds; and H2: The greater the participation of institutional investors in the ownership structure of companies, the lower the yield spread of their bonds.

To this end, 171 companies carrying out 385 issuances of bonds, indexed to the IPCA price index and DI, are analyzed during the period from 2010 to 2018, through descriptive statistics, correlation analysis and cross section regression. The data are taken from the Bloomberg and Valor PRO databases. As a result, H2 was confirmed. The coefficient of -0.026 indicates that for each 1% increase in the ownership structure with institutional investor, the company's yield spread decreases by 0.026%. This result corroborates those obtained by Klock et al. (2005) and Cremers et al. (2007).

This study contributes to the analysis on the participation of family and institutional ownerships in the yield spread of corporate bonds of Brazilian publicly-held and privately-held companies, since there are no local studies about this theme—see Table 1. The eventual distinct characteristics between both groups may shed light on other organizations in emerging markets, about financing decisions with financial institutions and capital markets.

The conclusions presented in this study are subject to some limitations. The first one refers to the existence of limited information on privately-held companies and family firms. In the initial sample of bond issuances, privately-held companies with no information about their ownership structure were observed. Another limitation concerns the low operational volume of the primary market of bonds, with no possibility of obtaining the necessary information to assess the yield spread traded daily.

The evolution of this topic may consider the inclusion of corporate governance instruments, as well as the impact of covenants on the corporate yield spread, especially of privately-held companies. However, considering the limitations of the over-the-counter, primary and secondary bond markets in Brazil, analyzing the international market for Brazilian debt securities is also suggested.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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