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# The Double Role of Financial Covenants in Bond Issues in Brazil

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## Abstract

**Purpose** – This study aims to identify the relationship between the use of financial covenants and the cost of borrowing via bonds issued by firms in Brazil.

**Design/methodology/approach** – The sample comprised 269 bond series issued by 106 publicly-listed companies from 2010 to 2016. Covenants were sampled manually from the indentures and prospectuses of these issues. A distinction was made between covenants that must be fulfilled by the firm issuing the debt and those that create obligations for another firm that has a secondary liability to the issuer's creditors. A linear regression model was constructed to test the relationships between these covenants and the spreads paid on the bonds.

**Findings** – The results indicate that covenants that must be observed by the issuer are used as a complementary mechanism to the risk premium charged by creditors. In turn, covenants that bind guarantors constitute a mechanism to substitute the risk premium, reducing the spread. These findings show that financial covenants play a double role in bond issues in Brazil and that the role varies depending on the firm that is responsible for complying with the covenant.-

**Originality/value** – This paper contributes to the literature by showing that the effect of financial covenants on the cost of debt varies as a function of which firm must fulfill the covenant. It therefore demonstrates that it is essential to control for the responsibility to fulfill covenants when measuring their effect on the cost of debt.

**Keywords** – financial covenants; cost of debt; bonds; spread.



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## I Introduction

Corporate debt contracts generally include covenants that must be complied with over the term of the debt. Since these clauses impose a variety of different constraints, they have been classified into three general covenant categories: (a) affirmative; (b) negative; and (c) financial (Nini, Smith, & Sufi, 2012). The first category comprises covenants that oblige the borrowing firm to perform certain actions, such as sending copies of its financial statements to creditors on a regular basis (Nini et al., 2012). Negative covenants impose constraints on the firm's actions, such as restricting its freedom to change shareholder control or to pay dividends (Nini et al., 2012). Finally, financial covenants are based on accounting numbers and stipulate financial conditions that the firm must meet during the debt term, such as a maximum level of debt or a minimum level of profitability (Mather & Peirson, 2006).

Covenants perform two functions in the debt contracting process: (a) they can reduce agency conflicts between the firm and its creditors (Smith & Warner, 1979), which can be achieved by all three categories of covenants; and (b) they can reduce uncertainty with relation to the issuing firm's ability to pay the debt in the future (Demerjian, 2017), which can be achieved using financial covenants. Taken in conjunction, these functions mean that employing covenants can reduce creditors' risk in relation to problems that could arise after the debt is contracted, such as agency conflicts (Smith & Warner, 1979), or insolvency (Demerjian, 2017). Consequently, the inclusion of these clauses would tend to increase the firm's ability to obtain finance from creditors, and improve the contractual conditions of the debt.

Based on this reasoning, empirical studies have been undertaken to identify the effect of covenants on the cost of issuing debt. However, while these studies have made contributions to the financial and accounting literature, certain

questions about the role of covenants in relation to the cost of debt remain unanswered.

The first of these issues is related to the disparate results reported for the relationship between covenants and the cost of debt. For example, studies undertaken in the United States (Reisel, 2014; Bradley & Roberts, 2015; Simpson & Grossmann, 2017) and in China (Gong, Xu, & Gong, 2015), investigating private corporate loan markets and public bond markets, have found that the inclusion of covenants that limit managers' freedom with relation to investment and borrowing policies tend to reduce the cost of debt. However, another body of evidence indicates that covenants may also be related to higher debt spreads (Graham, Li, & Qiu, 2008; Hasan, Park, & Wu, 2012; Knyazeva & Knyazeva, 2012). These studies were conducted using data from the private debt (bank loans) market in the United States and suggest that creditors use risk premiums and the inclusion of covenants as complementary mechanisms to protect the capital provided. Thus, firms that pay higher yields to acquire resources also have to comply with larger numbers of covenants.

A second unanswered question is whether the role of covenants varies as a function of their different categories, especially in terms of the distinction between financial and non-financial covenants. One issue that feeds this debate is that the two classes of financial and non-financial covenants have specific characteristics and play different roles in the contractual relationship between a firm and its creditors. While non-financial covenants define obligations (affirmative covenants) or impose prohibitions (negative covenants), financial covenants define financial parameters that must be met by borrowers. It is therefore possible that creditors may view financial and non-financial covenants differently at the time of assessing the risk of securities and that they have different implications for the pricing process. Evidence to support these hypotheses has been reported by Chang and Ross (2016), who conducted tests with market analysts and found

that they consider covenants that offer protection against the debt issuer's risk of bankruptcy to be of greatest relevance. Thus, financial covenants may be of greater interest to creditors, because they offer control over indicators such as debt coverage, total debt, and cash flow, among other indicators of the risk of insolvency or bankruptcy.

Additionally, another peculiarity of covenants is the possibility of writing clauses that impose obligations that must be met by companies other than the debt issuer, such as subsidiaries, parent companies, or firms that provide surety and guarantees that the issuer's debt will be repaid to the holder (Konraht, 2017). Creditors use these contractual devices to monitor both the issuing firm's risk and that of other firms that have secondary liability as guarantors, in the event that the issuer defaults on its debts. This type of formulation of the obligation to fulfill covenants has been documented in the North American (Reisel, 2014) and Brazilian (Konraht, 2017) bond markets, but there is limited evidence available on its relevance to the protection of creditors against debt agency problems. Reisel (2014) has pointed out that it is unclear whether covenants that must be fulfilled by other firms in a business group, such as subsidiaries, are of benefit to creditors in terms of reducing debt agency conflicts. It is thus a worthwhile exercise to conduct tests to ascertain whether clauses that must be fulfilled by entities providing guarantees for the issuer are of sufficient relevance to debt holders that they are priced into the spread.

Finally, it has been documented that differences in the institutional environments in which debt is contracted, such as legal enforcement and protection of creditors, change the ways in which covenants are used in debt contracts (Hong, Hung, & Zhang, 2016). With respect to this matter, Taylor (2013) has stated that there is a need for literature that seeks evidence on how covenants are used in emerging countries, such as Brazil, China, and India, since these countries have different patterns and trends of corporate finance, corporate governance, and

accounting practices, compared to the developed countries where the foundations of the literature on covenants were laid.

It is against this background that this paper attempts to identify the relationship between the use of financial covenants and the cost of issuing debt via corporate bonds in Brazil. The analysis contributes to filling gaps in the literature by investigating how financial covenants are priced by creditors in an institutional environment with weak protections for creditors and poor legal enforcement and also by testing whether pricing varies as a function of which firms are obliged to fulfill financial covenants, whether (a) the debt issuer or (b) firms providing guarantees for the issuer.

Brazil is a potentially relevant institutional environment for this empirical analysis, since it is characterized by weak creditor protections and poor legal enforcement (Hong et al., 2016), both of which are factors that increase creditors' risk. Furthermore, evidence on the use of covenants in Brazil indicates that the inclusion of financial covenants to be fulfilled by guarantors is relatively common in bond issues, since approximately 12% of covenants are specified in this manner (Konraht, 2017).

Methodologically, the cost of debt was measured in terms of securities' spread, against Brazil's benchmark interbank deposit rate (DI). Financial covenants were sampled manually from bond indentures and prospectuses. The analysis encompassed tests with all financial covenants and analyses stratified by whether covenants should be fulfilled by the debt issuer or by guarantors.

The results revealed that financial covenants play a dual role in debt contracting, since the relationship between their inclusion and the cost of debt varies as a function of which firm is responsible for fulfilling them. For covenants that must be fulfilled by the debt issuer, the function of financial covenants is as a protection mechanism that complements the risk premium charged by the creditors. Thus, the higher the issuance cost, the greater the number of financial

covenants that must be fulfilled exclusively by the debt issuer. In contrast, covenants that must be fulfilled by guarantors function as mechanisms to substitute the risk premium charged by the creditors. Thus, the cost of issuing debt reduces as the number of financial covenants to be fulfilled by parent companies, subsidiaries, or third-parties providing guarantees increases.

This paper therefore makes three original contributions to the literature. The first is the finding that financial covenants that must be fulfilled by guarantors reduce the cost of issuing debt. As such, the results indicate that this form of covenant is relevant to reducing the agency costs of debt, since these clauses act as a mechanism that enables creditors to monitor the capacity of the guarantors to pay, if the debt issuer defaults, thus providing answers to the questions raised by Reisel (2014) about the relevance to creditors of this type of covenant. The second contribution is the finding that in the Brazilian setting financial covenants that must be fulfilled by the debt issuer function to complement the risk premium priced into the spread of the debt issue, so that riskier issuers have to pay a higher price to borrow and accept a greater number of financial covenants that must be fulfilled by the debt issuer itself. Finally, the third contribution is to show that in the Brazilian setting financial covenants that must be fulfilled by the debt issuer and those that must be fulfilled by guarantor firms have opposite relationships with the cost of issuing debt.

It is notable that the Brazilian literature on the determinants of bond yields (Sheng & Saito, 2005; Gonçalves & Sheng, 2010) or on the use of covenants in these securities (Saito, Sheng, & Bandeira, 2007; Silva, Saito, & Barbi, 2013; Beiruth, Fávero, Murcia, Almeida, & Brugni, 2017; Konraht, 2017) does not answer the question of whether bondholders price financial covenants into the spread. This paper therefore goes beyond existing research in providing evidence to show that financial covenants are one of the factors that influence the price of debt and that this relationship varies as a function of which firms are bound by the covenants.

## 2 Review of the Literature and Formulation of Hypotheses

Financial covenants perform two functions in debt contracting: (a) they reduce agency conflicts between firms and their creditors caused by opportunism on the part of managers and shareholders (Smith & Warner, 1979); and (b) they facilitate renegotiation of the terms of loans if unexpected events occur that could not be predicted when the debt was originally contracted (Demerjian, 2017).

The agency conflict problem arises from the possibility that shareholders (represented by management) could adopt policies that maximize the value of their residual claims to the detriment of the claims of their creditors during the life of a debt (Black & Scholes, 1973; Jensen & Meckling, 1976). According to Smith and Warner (1979), this is primarily accomplished by means of: (a) underinvestment (Myers, 1977; Smith & Warner, 1979); (b) excessive distribution of dividends (Smith & Warner, 1979); (c) claim dilution (Smith & Warner, 1979); or (d) asset substitution (Jensen & Meckling, 1976; Smith & Warner, 1979).

However, these potential conflicts tend to be anticipated and priced in by the market during debt contracting (Jensen & Meckling, 1976). Consequently, creditors tend to protect their interests by charging a premium for the risk to which they are exposed when financing the investments of firms with a greater probability of debt agency costs, which is reflected in a higher cost of borrowing (Jensen & Meckling, 1976; Myers, 1977; Smith & Warner, 1979).

In order to attenuate these problems, debt contracts may contain covenants that constrain managers' freedom to select investment and borrowing policies (Jensen & Meckling, 1976; Smith & Warner, 1979; Taylor, 2013). Therefore, with relation to debt agency conflicts, the function of these covenants is to prevent management from taking actions that are prejudicial to creditors' claims after debt has been issued, such as increasing debt levels, paying excessive dividends,

or taking other actions that transfer wealth from creditors to shareholders (Smith & Warner, 1979).

Christensen and Nikolaev (2012) claim that the most effective type of financial covenants for this purpose are financial covenants known as ‘capital’ covenants, which are triggered by metrics based on debt structure and tangible asset structure, respectively obliging shareholders to maintain a minimum level of capital invested in the firm and management to maintain a minimum level of investment in tangible assets (Christensen & Nikolaev, 2012). Consequently, capital covenants contribute to aligning the interests of debt holders and shareholders, creating incentives for shareholders to monitor management activities (Christensen & Nikolaev, 2012).

Another problem that permeates the corporate borrowing process is uncertainty about the issuing firm’s future ability to pay. This problem arises from the inability of both parties, creditor and issuer, to know all relevant information about the financial performance of the firm after debt has been issued, since performance is a function of uncertain future events (Demerjian, 2017). This problem is different from the agency conflict problem because it is not a result of opportunistic management actions, but of the absence of confirmatory information about the firm’s future financial performance at the time debt is contracted (Demerjian, 2017).

This uncertainty with relation to future events could cause difficulties when negotiating the characteristics of debt contracts, since the indeterminate nature of variables relevant to risk make risk estimation imprecise (Demerjian, 2017). The main consequence of this for creditors is that the risk in the future may be greater than the risk estimated at the time of debt contracting. This would mean that creditors would be paid a premium that is lower than the risk they are exposed to (Demerjian, 2017).

One method of ameliorating this obstacle when contracting is to include covenants that employ accounting indicators correlated with elements of risk that are of relevance to the

lender. This function is exclusive to financial covenants, since accounting indicators capture financial attributes that are representative of the debt issuer’s risk (Demerjian, 2017). This second function of financial covenants provides a legal mechanism that guarantees the opportunity to renegotiate the debt if the borrower’s performance falls below the minimum level acceptable to the lender (Dichev & Skinner, 2002; Demerjian, 2017).

‘Performance’ financial covenants are most appropriate for this function (Demerjian, 2017), since they tend to illustrate the current and future financial situation of the firm in a more timely manner than capital covenants (Christensen & Nikolaev, 2012). Performance covenants possess this characteristic because they employ metrics that are the result of the firm’s current performance, whereas capital covenants are the result of accumulated past investments and borrowing (Christensen & Nikolaev, 2012).

Additionally, Chang and Ross (2016) have observed that covenants do not only protect creditors from the risks of agency conflicts and insolvency, but they also protect against risks of bankruptcy and information asymmetry in debt contracting. Of these aspects, Chang and Ross (2016) found that the risk of bankruptcy has the greatest influence on the pricing of debt securities by market analysts. Based on these findings, it can be inferred that covenants employing financial indicators that measure debt coverage, debt level, and financial performance generally tend to be relevant to pricing debt securities, since these indicators are correlated with the firm’s risk of bankruptcy.

Taken in conjunction, the theoretical underpinnings of the functions of financial covenants indicate that their use tends to be reflected in better borrowing conditions, because they tend to reduce the level of risk to which creditors are exposed. Thus, one possible result of the inclusion of these clauses is a reduction in the risk premium charged by creditors, improving the cost payable for debt taken on by issuing



bonds (Reisel, 2014). Consistent with this line of reasoning, Reisel (2014), Bradley and Roberts (2015), Chang and Ross (2016), Gong et al. (2015), and Simpson and Grossmann (2017) have found that creditors price debt contracts that contain restrictive covenants favorably.

More specifically, Reisel (2014) and Gong et al. (2015) analyzed the effect on debt spreads of the inclusion of covenants, finding that bond yield spreads were lower when at least one covenant was included that restricted policies on: (a) borrowing or (b) investment and sale of assets. Reisel (2014) analyzed bonds issued in the United States, whereas Gong et al. (2015) focused on bonds issued in China. Bradley and Roberts (2015) analyzed the effect on spreads of including covenants in the corporate loan agreements of firms in the United States, finding that, in general, the inclusion of covenants tended to reduce the premium demanded by creditors.

Reisel's study (2014) was later extended by Simpson and Grossmann (2017), who tested whether the effect of restrictive clauses on the cost of debt that Reisel (2014) had found for the period prior to the 2008 financial crisis was maintained after the crisis. They found significant differences between these two periods in the value attributed to specific restrictive clauses, indicating that in the bond market the relevance of the protection offered by covenants is dynamic over time. Specifically, they found that clauses including negative pledges and those restricting sale-and-leaseback reduced the cost of debt before the financial crisis, whereas their effect was no longer statistically significant after the crisis. However, restrictions on paying out dividends and taking on additional debt, which had been irrelevant before the crisis, were relevant to the pricing of debt securities after the crisis. Simpson and Grossmann's (2017) main contribution is to show that the roles played by covenants in debt contracting vary over time, since macroeconomic conditions affect the value creditors attribute to the additional guarantees afforded by covenants.

Finally, Chang and Ross (2016) interviewed debt market analysts to test how they attributed

pricing to covenants. They found that the analysts priced bonds with covenants to protect creditors' interests favorably and that the aspect of risk that was most relevant to bond valuation was protection against the risk of issuer bankruptcy.

It can be concluded, therefore, that financial covenants can reduce creditors' ex-post risk, which tends to be reflected in better contractual conditions, including the cost of debt. As such, they constitute a substitute mechanism for the risk premium charged by creditors when providing capital. The following research hypothesis can therefore be formulated:

**H1:** *The inclusion of financial covenants partially reduces the risk to which creditors are exposed, which is reflected in a lower risk premium charged by the creditors.*

An alternative to this hypothesis rests on evidence from the North American lending market showing that covenants can have a positive relationship with the cost of debt, since both covenants and yield rates are used by creditors as protections from exposure to risk. Specifically, Graham et al. (2008) found that financial restatements tend to trigger lenders' uncertainty with regard to the reliability of a firm's financial condition, which prompts them to increase interest rates and the number of covenants in subsequent loans. Hasan et al. (2012) and Knyazeva and Knyazeva (2012) found, respectively, that increased uncertainty about the borrower's future results and greater distances between borrower and lender concomitantly lead to higher interest rates, the imposition of a greater numbers of covenants, and requirements for additional guarantees when borrowing from third parties.

This effect is similar to what has been documented in the literature by Bharath, Sunder, and Sunder (2008) with regard to the relationship between the cost of debt and requirements for collateral in bank loan contracts. They explain that this phenomenon exists because riskier loans are

subject to both higher interest rates and a higher probability of requirements for collateral.

Taken together, this evidence suggests that financial covenants may be a mechanism that complements the risk premium charged by creditors. As such, to protect themselves, creditors employ both the inclusion of covenants and higher interest charges. As a consequence, riskier loans have larger spreads and are also subject to more contractual restrictions. On this basis, the following research hypothesis can be formulated:

**H2:** *The inclusion of financial covenants is a complementary mechanism to the risk premium charged by creditors, with the result that firms that borrow at higher rates will also have to comply with a greater number of financial covenants.*

### 3 Methodological procedures

#### 3.1 Sample, period, and variables

The analysis of the relationship between the use of financial covenants and the cost of debt is based on data on bonds issued in Brazil by non-financial firms listed on the Bolsa Brasil Balcão (B<sup>3</sup>) exchange. The time period analyzed runs from 2010 to 2016. One class of securities offering tax incentives on earnings, known as *debêntures incentivadas*, was excluded from the sample because the income tax exemption on these bonds' yields affects the real interest earned by creditors and, consequently, the spreads.

These criteria identified 363 bonds on the Brazilian national bonds registry. These securities included both bonds issued within the provisions of a Brazilian securities commission regulation that relaxes reporting requirements and restricts securities to accredited investors (*Instrução Normativa CVM nº 476*) and also bonds available to the general public (regulated by *Instrução Normativa CVM nº 400*). Some of these bonds have issued more than one offer, bringing the total number of debt securities to 495.

In order to define the sample to be analyzed, a survey was conducted of the criteria for calculating yields for the 495 securities identified, since each series is able to establish a specific criterion for calculating its coupon rate and the spread varies depending on these criteria. Additionally, to minimize the risk of bias in sample selection, analysis of variance (ANOVA) tests were conducted to detect similarities between the characteristics of securities with the most frequently employed calculation criteria. The criteria for calculating bond coupon rates are listed in Table 1.

Table 1  
**Coupon calculation criteria for the bond series**

Coupon rate criteria	Bond series	Proportion	Final sample
DI + % spread	269	54.3%	269
DI + % of DI	134	27.1%	-
IPCA + % spread	82	16.6%	-
TR + % spread	5	1.0%	-
TJLP + % spread	2	0.4%	-
IGP-M + % spread	1	0.2%	-
Fixed rate	1	0.2%	-
No index	1	0.2%	-
Total	495	100%	269

**Key:** DI: Interbank Deposit rate; IGP-M: General Market Prices Index; IPCA: Comprehensive Consumer Prices Index; TR: Reference Rate; TJLP: Long Term Interest Rate.

**Note:** The 269 series of bonds that use the interbank rate plus a spread were issued by 106 different firms and were chosen as the final sample for this analysis.

The survey of coupon calculation criteria revealed that a majority of these securities pay the interbank deposit rate (DI) plus a fixed spread percentage (DI+%spread), which is the coupon criterion with the greatest number of observations available for data analysis. Furthermore, the ANOVA results indicate that bonds with the coupon criterion "IPCA+%spread" or "DI + % of DI" have characteristics that distinguish them from those with other coupon calculation



methods. For example, IPCA+%spread bonds have significantly longer maturity than the other bonds, and “DI + % of DI” bonds used significantly fewer financial covenants and were issued by firms with greater growth opportunities (measured by market-to-book of assets) than bonds with other coupon calculation criteria. In view of these findings, it was decided to select bonds with coupons based on the DI+%spread criterion as the sample, since this set offered the greatest quantity of data for empirical analysis and was most representative of bonds issued in Brazil, minimizing possible sample selection biases. The dependent variable cost of debt was therefore operationalized as the spread additional to the DI rate, adjusted for the result of the book building process, in a similar manner to the method used by Sheng and Saito (2005).

The variable of interest in the present article is use of financial covenants, collected manually from bond indentures and prospectuses. Financial covenants were identified using the concept presented by Ramsay and Sidhu (1998), who define them as restrictive covenants based on accounting numbers or indicators.

During the collection of data on covenants, the firm responsible for complying with the covenant set out in the bond indentures and prospectuses was identified. It was found that these clauses were either specified as obligations to be fulfilled by the issuing firm or specified as obligations to be fulfilled by a firm other than the issuer that was under some type of secondary liability obligation (hereafter referred to as “guarantors”) with relation to paying creditors (specifically: parent company, subsidiary, or third-party guarantor providing either financial or

collateral security). Thus, analyses were conducted to determine the relationships between the use of financial covenants and the cost of debt for covenants that bind the issuer and for those that bind the guarantors, in order to test the effects on spreads of these two models of covenant.

In addition to these two variables, spread and financial covenants, control variables that could have an effect on spreads were also included in the regression models. These variables were as follows: (a) characteristics of the firm (size and debt), to capture the firm’s risk, where a negative relationship is expected for size and a positive relationship for debt, since larger firms tend to be less risky for creditors (Rajan & Zingales, 1995), and firms with less debt tend to be less risky (Graham et al., 2008); (b) characteristics of the debt (collateral and maturity), since firms can issue bonds with shorter maturities to reduce creditors’ risk (Nash, Netter, & Poulsen, 2003) or offer collateral to confer additional protection. Notwithstanding, Bharath et al. (2008), Hasan et al. (2012), and Knyazeva and Knyazeva (2012) found that firms that borrow at higher rates are also required by creditors to provide more guarantees. Therefore, a negative relationship is expected for debt maturity, whereas there is no a priori expectation with relation to collateral; (c) macroeconomic characteristics (the Brazilian central bank base rate – Selic, and annual dummy variables), where a positive relationship between the Selic and spreads is expected, since variations in the Selic rate (which is a risk-free rate) are expected to have an effect in the same direction on bonds that incorporate risk.

The linear regression model specified for the tests is shown in Equation 1.

$$\begin{aligned} Spread_i = & \alpha_i + \beta_1 Use\ of\ financial\ covenants_i + \beta_2 Firm\ size_i + \beta_3 Debt_i + \beta_4 Collateral_i \\ & + \beta_5 Maturity_i + \beta_6 Selic_t + \sum_{k=2011}^{2016} \delta_k Year_k + \varepsilon_i \end{aligned} \quad (1)$$

Table 2 describes how the study variables were operationalized.

Table 2

**Description of study variables**

Variable	Type	Operationalization	Relationship expected
Debt spread	Dependent	Natural logarithm of interest exceeding the DI rate.	
Use of financial covenants	Variable of interest	(a) Number of financial covenants included in bond; (b) Number of financial covenants to be fulfilled by issuing firm; (c) Number of financial covenants to be fulfilled by firms providing guarantees for the issuer.	+/-
Firm size	Control	Natural logarithm of total assets.	-
Debt	Control	Long and short term liabilities/total assets.	+
Collateral	Control	Binary (dummy) variable that is coded as 1 if the bond is guaranteed by collateral, and as 0 if not.	+/-
Maturity	Control	Natural logarithm of the number of months from the bond issue date to the bond maturity date.	+
Selic	Control	Accumulated monthly Selic rates for the 12 months preceding the bond issue date (inclusive).	+
Year	Control	Dummies for each year in the dataset.	+/-

Source: the authors.

## 4 Results

firms must fulfill them, and the principal types of financial covenants used.

### 4.1 Descriptive statistics

Table 3 lists descriptive statistics for the use of financial covenants, specifying which

Table 3

**Financial covenants used in bond issues**

<b>Panel A:</b> Number of covenants to be fulfilled by the issuer or by its guarantors							
	None	One	Two	Three	Four	Five	Total
All covenants	34 (13%)	40 (15%)	149 (55%)	35 (13%)	8 (3%)	3 (1%)	490
Performance covenants	50 (19%)	55 (20%)	146 (54%)	13 (5%)	5 (2%)	-	406
Capital covenants	210 (78%)	34 (13%)	25 (9%)	-	-	-	84
<b>Panel B:</b> Number of covenants that must be fulfilled by the debt issuer							
	None	One	Two	Three	Four	Five	Total
All covenants	58 (22%)	38 (14%)	133 (49%)	32 (12%)	6 (2%)	2 (1%)	434
Performance covenants	75 (28%)	52 (19%)	129 (48%)	11 (4%)	2 (1%)	-	351
Capital covenants	211 (78%)	33 (13%)	25 (9%)	-	-	-	83
<b>Panel C:</b> Number of covenants that must be fulfilled by guarantors							
	None	One	Two	Three	Four	Five	Total
All covenants	239 (89%)	8 (3%)	20 (7%)	1 (0,5%)	-	1 (0,5%)	56
Performance covenants	239 (89%)	8 (3%)	20 (7%)	1 (0,5%)	1 (0,5%)	-	55
Capital covenants	268 (99,5%)	1 (0,5%)	-	-	-	-	1
<b>Panel D:</b> Type of relationship between guarantor and issuing firm							

	Parent company or subsidiary	Collateral Guarantor	Financial Guarantor
Frequency (proportion)	30 (53,6%)	18 (32,1%)	8 (12,3%)
<b>Panel E:</b> Financial indicators used in financial covenants			
	Indicator	Frequency	Proportion (%)
	Net Debt/EBITDA	203	41,5
	EBITDA/Financial Results	120	24,5
	EBITDA/Financial Costs	26	5,3
	Net Debt/Net Equity	19	3,9
	Cash flow/(Amortization of Debt Principal + Interest)	17	3,5
	Current Assets/Current Liabilities	10	2,0
	(Net Debt + Property Costs Outstanding)/Net Equity	7	1,4
	Gross Debt/EBITDA	7	1,4
	Others*	81	16,5
	<b>Total</b>	<b>490</b>	<b>100%</b>

**Note:** In Panels A to D, the values shown outside of the parentheses indicate the number of bonds that contain the total quantity of covenants specified in the column headings. In Panels A to C, the figures within parentheses show the relative proportion of the 269 bonds in the series. Proportions in Panel D are in relation to the 56 detailed in Panel C.

\*Others: 49 financial indicators, each accounting for < 1% of the total.

Source: research data.

The majority (89%) of the entire set of financial covenants included in indentures and prospectuses are written to be fulfilled by the debt issuer. An analysis of covenants that must be fulfilled by guarantors shows that these firms are under secondary liability as guarantors of the issuer, in the case of default on the debt. Specifically, these guarantors are either part of the same business group as the issuer, as parents or subsidiaries, or they are third-party firms that have taken on a legal obligation to act as guarantors, providing financial or collateral security for payment, in case of default by the issuer. This shows that the financial covenants included in bond agreements are specified either as being an obligation binding the issuing firm or, alternatively, an obligation binding a firm that is

under a secondary liability as a guarantor of the issuer in the event the issuer defaults.

With regard to the financial indicators used as metrics in covenants, there was a predominance of indicators of debt coverage (Net Debt/EBITDA) and interest coverage (EBITDA/Financial Costs and EBITDA/Financial Results), accounting for approximately 71% of the entire sample of covenants. With regard to covenant classes, it was observed that the most frequently used capital covenants were Net Debt/Net Equity, Current Assets/Current Liabilities, and (Net Debt + Property Costs Outstanding)/Net Equity, while the other covenants listed in Panel E were performance covenants.

Table 4 lists descriptive statistics for the other variables.

Table 4  
Descriptive statistics for variables

Variable	N	Mean	SD	CV	Min	Q1	Md	Q3	Max
Spread (%)	269	1,96	1,15	0,59	0,14	1,18	1,65	2,5	10,2
Collateral	269	12,3%	-	-	0	0	0	0	1
Maturity (months)	269	59,8	23,6	0,39	5,23	48,7	60,9	73,0	165,9
Firm size (R\$ billion)	269	9,05	13,5	1,49	0,15	2,35	4,63	10,1	98,4
Debt (%)	269	65,3	14,3	0,22	30,9	56,4	65,3	75,8	99,4
Selic (%)	269	10,2	1,91	0,19	7,31	8,5	10,4	11,5	14,2

**Key:** N: number of observations; SD: standard deviation; CV: coefficient of variation; Min: lowest value; Q1: first quartile; Md: median; Q3: third quartile; Max: highest value.

Source: study data.

It can be observed that the mean percentage spread above the DI rate is approximately 1.96% per annum; the mean maturity of bond issues is approximately 60 months; and approximately 12% of the bond series offer collateral against the capital borrowed.

## 4.2 Inferential analyses

Table 5 lists the results of the econometric estimations. The models exhibited general validity at a 99% confidence level. The assumptions of the estimation method (Ordinary Least Squares) were fulfilled, indicating that the regression was correctly specified.

Table 5  
Regression results

<b>Model:</b> $Spread_i = \alpha_i + \beta_1 Use\ of\ financial\ covenants_i + \beta_2 Firm\ size_i + \beta_3 Debt_i + \beta_4 Collateral_i + \beta_5 Maturity_i + \beta_6 Selic_t + \sum_{k=2011}^{2016} \delta_k Year_k + \varepsilon_i$						
Firm responsible for complying with covenants	Model 1		Model 2		Model 3	
	Issuer and guarantors		Issuer only		Guarantors only	
Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Use of financial covenants	0,033 (1,32)	0,184	0,068 (2,95)	0,003	-0,113 (-2,56)	0,011
Firm size	-0,147 (-7,14)	0,000	-0,132 (-5,86)	0,000	-0,140 (-6,43)	0,000
Debt	0,686 (3,78)	0,001	0,676 (3,68)	0,000	0,725 (3,83)	0,000
Collateral	0,283 (3,58)	0,000	0,307 (3,55)	0,000	0,322 (3,78)	0,000
Maturity	0,009 (0,14)	0,870	0,035 (0,53)	0,598	0,047 (0,73)	0,464
Selic	5,63 (1,59)	0,117	4,911 (1,40)	0,164	5,11 (1,44)	0,152
Constant	1,938 (3,50)	0,001	1,620 (2,78)	0,006	1,767 (3,11)	0,002
Fixed effect of year	Yes		Yes		Yes	
Fixed effect of industry	No		No		No	
F test (F)	25,24	0,000	25,74	0,000	22,93	0,000
Jarque-Bera test ( $\chi^2$ )	2,29	0,318	5,47	0,065	2,46	0,292

Breusch-Pagan/Cook-Weisberg test of heteroscedasticity ( $\chi^2$ )	0,00	0,983	0,39	0,532	0,01	0,935
R <sup>2</sup>	0,472		0,473		0,474	
Adjusted R <sup>2</sup>	0,447		0,448		0,449	
Number of observations	265		266		266	
Number of firms	104		105		105	

**Note:** The values given in parentheses are the *t* statistics of the coefficients. The Jarque-Bera and Breusch-Pagan/Cook-Weisberg tests showed, respectively, that there were no problems of non-normality or heteroscedasticity of residuals in these models. The results shown were estimated with robust errors. The variance inflation factors indicate that multicollinearity is not present, since the highest value for the three models was lower than 10. Significance was calculated for two-tailed probability.

Source: the authors.

These results demonstrate that the relationship between financial covenants and debt cost spread varies as a function of how the covenants are used. Specifically, when all covenants included in bond agreements were analyzed together (Model 1), it was found that the number of covenants had no relationship with spread. In contrast, when covenants that bind the debt issuer were analyzed (Model 2), it was observed, to a 99% confidence level, that there was a positive relationship between number of covenants and spread. Finally, when covenants that bind guarantors were analyzed, it was observed, to a 98% confidence level, that there was a negative relationship between number of covenants and spread. These results suggest that the substitution and complementation effects described by Hypotheses 1 and 2 take place in conjunction in bond issues, but are not captured when all clauses are analyzed together (Model 1), since the effects cancel out.

The positive relationship between the use of covenants to be fulfilled by the issuer and spread can be explained by the fact that they function as a protective mechanism that complements the risk premium priced into the spread, confirming Hypothesis 2. Thus, during the debt contracting process, creditors employ both methods: charging a risk premium to provide capital and including financial covenants to be fulfilled by the issuer during the loan term.

Although a comparative analysis with the situation in other countries is beyond the

scope of this study, it is possible that these results are partially due to the Brazilian institutional characteristic of poor protection of creditors' rights, as highlighted by Hong, Hung, and Zhang (2016), which forces them to demand additional guarantees when providing capital. Another possible partial explanation is the Brazilian characteristic of low availability of sources of long-term financing, which reduces firms' bargaining power in negotiations, forcing them to offer additional guarantees to successfully acquire long-term finance, without these guarantees causing direct reductions in the cost of debt. Therefore, the results of Model 2 provide further evidence to support the preliminary explanations suggested by Konraht (2017) for the greater use of financial covenants in bond issues in Brazil. Specifically, Konraht indicated that the greater reliance on financial covenants in Brazil, in comparison with reports in international studies, could reflect firms' efforts to create additional mechanisms for creditor protection, thereby compensating for the lack of protection of creditors' rights, making providing capital more attractive.

In turn, the negative relationship between the use of financial covenants that bind guarantors and spread (Model 3) could be explained by the theory that these covenants are defined with the objective of monitoring the financial health of firms that have secondary liability for the issuer in the event of default. As a result, creditors enjoy double protection against default: (a) first, in the event that the debt issuer defaults, creditors



can take legal action against both the issuer and guarantor firms; and (b) as a complement to this, if the guarantor reports detectably worse financial performance, creating a risk that it will not have the financial conditions to pay a potential debt that it has accepted alongside the issuer, then it will be in technical breach of the debt agreement and creditors can choose between the resulting implications, which include demanding early repayment or renegotiating the terms of the debt. Thus, financial covenants that must be fulfilled by guarantors work as an additional guarantee, since they ensure that guarantors maintain the financial solidity needed to cover payment of the debt if the issuer is unable to pay it. This finding is further supported by the data in Table 2, Panel C, showing that 98% of the covenants that must be fulfilled by guarantors are of the performance covenants class. This class is employed with the objective of monitoring borrower performance, helping to avoid situations in which the guarantors do not have the financial health necessary to cover possible default by the issuer.

An alternative explanation for this result could be that bond contracts that contain financial covenants that must be fulfilled by guarantors also contain covenants that must be fulfilled by the debt issuer, which would confer double protection via these covenants. However, an additional test was conducted, analyzing data on concomitant use of covenants that must be fulfilled by the debt issuer and covenants that must be fulfilled by guarantors, finding that, in addition to the fact that results for covenants creating obligations for guarantors were negatively correlated with those referring to issuers, just 22% of the bond series that had covenants to be fulfilled by guarantors also had clauses to be complied with by the issuer. This alternative explanation is therefore rejected.

Comparing these results with those of similar studies, it was found that the effect of financial covenants that must be fulfilled by the issuers of bonds in Brazil is not identical to the effects documented for covenants in general in research by Reisel (2014), Bradley and Roberts (2015), Gong et al. (2015), and Simpson and

Grossmann (2017). In Brazil, the effect observed in those studies was only detected for covenants that must be fulfilled by guarantors. Therefore, one contribution made by this study is the finding that using covenants that must be fulfilled by guarantors reduces the cost of debt issues, elucidating a point that was previously unclear in the literature (Reisel, 2014). However, the finding that covenants and risk premium had complementary effects, documented in analyses by Graham et al. (2008), Hasan et al. (2012), and Knyazeva and Knyazeva (2012), was repeated in Brazil for covenants that must be fulfilled by the debt issuer.

With regard to the control variables, the results were in line with the relationships expected a priori, with the exception of collateral, maturity, and Selic. This indicates that the observed effect of the use of collateral is similar to that for financial covenants that must be fulfilled by the debt issuer, i.e., it is used to confer additional protection to complement the risk premium, and is offered to enable borrowing. This finding is consistent with the argument that riskier borrowing operations are subject to both higher interest rates and more demands for additional guarantees (Bharath et al., 2008), in line with results observed by Bharath et al. (2008), Hasan et al. (2012), and Knyazeva and Knyazeva (2012). In turn, the absence of any effect of maturity on the spread could be because the variable employed to measure maturity is an ineffective proxy to represent the duration of bonds, which is the true length of time that the creditor is exposed to the lending risk. The absence of any effect of the Selic rate can be explained by the dummy variables for each year in the dataset capturing the majority of its effect on the spread. When the regressions were run again without the year dummies, the Selic rate had a positive relationship that was statistically significant with a 99% confidence level.

### 4.3 Tests of robustness

The consistency of the results shown in Table 5 was assessed by conducting further

tests with additional control variables included in the model. The following variables were added sequentially: industry, overall liquidity, profitability, and market-to-book of assets (a proxy for growth opportunities). In the literature, these variables are considered to be factors that have an influence on cost of debt, but they were only included in additional tests because data were not available to measure them for some firms, or because their inclusion violated certain econometric assumptions, reducing the number of observations available for statistical analysis.

The results of these tests indicated that the complementary nature of the effect of financial covenants that must be fulfilled by the debt issuer is still consistent after controlling for the effects of industry, overall liquidity, profitability, and growth opportunities (market-to-book of assets), to a 99% confidence level. For covenants that must be fulfilled by guarantors, the additional tests indicated that the substitution effect with relation to spread is still consistent, to a 90% confidence level, even after controlling for industry, overall liquidity, and profitability. It was impossible to estimate the regression controlling for market-to-book of assets for covenants applicable to guarantors, since there was only one debt security for which market-to-book data were available that used financial covenants that must be fulfilled by guarantors.

## 5 Final comments

This study tested relationships between the use of financial covenants and the cost of debt of bond issues in Brazil. The hypotheses tested in these analyses were that financial covenants function to substitute (H1) and complement (H2) the risk premium charged by creditors. According to H1, the use of covenants would tend to reduce the cost of debt, whereas H2 predicts that the use of financial covenants would have a positive association with cost of debt.

The results showed that both effects, complementation and substitution, took place in conjunction in bond debt contracting. More

specifically, substitution only occurs in bonds with covenants that must be fulfilled by guarantors. This is because these covenants function as mechanisms to enable creditors to monitor the financial health of the firms that have provided guarantees for the issuer, in the event that the issuer defaults. This creates an additional guarantee for creditors that, if an issuer is unable to recover the debt within the period contracted, the guarantor will have the financial health necessary to make payment.

In turn, the complementation effect is observed with financial covenants that create obligations to be fulfilled by the debt issuer. This is an indication that firms that borrow at higher interest rates are also required to comply with more financial covenants. Possible explanations for this phenomenon include effects of Brazil's institutional characteristics of poor lender protections (Hong et al., 2016) and limited sources of long-term finance. The partial explanation based on these two attributes is that poor lender protections and scarce supply of long-term credit, respectively, lead to creditors requiring more covenants to provide credit and leave firms with reduced bargaining power to reject creditors' requests to include these covenants.

Finally, it should be stressed that the complementary role of clauses to be fulfilled by debt issuers does not imply that these financial covenants are irrelevant to facilitating debt contracting between firms and creditors. Rather, under certain risk conditions, the firm may be faced with a choice between borrowing at high interest and with large numbers of financial covenants to be observed, or not having finance approved by creditors. Thus, the complementary role of financial covenants contributes to enabling riskier firms to borrow.

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Contribution	Jonatan Marlon Konraht	Rodrigo Oliveira Soares
1. Definition of research problem	√	√
2. Development of hypotheses or research questions (empirical studies)	√	
3. Development of theoretical propositions (theoretical Work)		
4. Theoretical foundation/ Literature review	√	
5. Definition of methodological procedures	√	√
6. Data collection	√	
7. Statistical analysis	√	
8. Analysis and interpretation of data	√	√
9. Critical revision of the manuscript	√	√
10. Manuscript Writing	√	√
11. Other (please specify which)		