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Differentiated levels of corporate governance and the probability of violating financial covenants

Níveis diferenciados de governança corporativa e a probabilidade de violação dos covenants financeiros

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Keywords
Financial covenants.
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Corporate governance.
Differentiated levels.
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Abstract

Corporate governance and financial covenants play complementary roles in monitoring companies as they reduce conflicts of interest between the parties involved when making debt contracts. This study expands this discussion by analyzing whether publicly traded Brazilian companies listed in B3's differentiated levels of corporate governance are less likely to violate financial covenants in an *ex-post* analysis of contract signing. The sample includes publicly traded non-financial Brazilian firms from 2010 to 2018, totaling 1,310 unbalanced panel observations for 206 companies. The data was obtained from Economatica, B³'s website and a hand collected database consisting of covenant information from the explanatory notes of the respective firms. Student's mean t-test and a logistic regression analysis with year fixed effects were performed to calculate and analyze the results, which present evidence that companies listed on B3's differentiated levels of corporate governance are less likely to violate financial covenants than other unlisted companies. This evidence suggests that B³ levels can be used as a *proxy* for governance in contractual contexts where there are conflicts of interest between the parties involved.

Palavras-chave
Cláusulas restritivas financeiras.
Contratos de dívida.
Governança corporativa.
Níveis diferenciados.
Violação dos covenants.

Resumo

A governança corporativa e os covenants financeiros exercem papéis complementares no monitoramento das companhias, na medida em que reduzem os conflitos de interesse entre as partes envolvidas durante a confecção de contratos de dívida. Esta pesquisa amplia esta discussão ao analisar se as companhias brasileiras de capital aberto listadas nos níveis diferenciados de governança corporativa da B³ apresentam menor probabilidade de violarem os covenants financeiros em uma análise ex-post à firmação dos contratos. A amostra abrangeu firmas brasileiras não financeiras de capital aberto no período de 2010 a 2018, totalizando 1.310 observações em painel desbalanceado para 206 empresas. Os dados foram obtidos junto ao Economatica, site da B³ e construção de base própria a partir de informações de covenants constantes nas notas explicativas das respectivas firmas. Para apuração e análise dos resultados, foi realizado teste de média T Student e análise de regressão logística com efeito fixo de ano. Os resultados apresentam evidências de que as companhias listadas nos níveis diferenciados de governança corporativa da B³ apresentam menor probabilidade de violarem os covenants financeiros do que as demais companhias não listadas nos respectivos níveis. Tal evidência sugere que os níveis da B³ podem ser usados como proxy de governança em contextos contratuais em que existem conflitos de interesses entre as partes envolvidas.

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Practical implications

The evidence supports the possibility of using B3 levels as a *proxy* for governance in contexts in which there are conflicts of interest between the parties involved. In practice, these levels can be used as complementary information for creditors in the evaluation of contractual risks and as a factor which supports and justifies the need to include financial covenants in debt contracts.

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1 INTRODUCTION

Covenants are clauses inserted in debt contracts that seek to protect the interests of creditors, limiting the discretionary role of managers and mitigating agency problems between parties involved in contracts (Emira & Amel, 2015; Demerjian, 2017; Prilmeier, 2017). The inclusion of these clauses depends on the characteristics of the company using this credit and the type of debt (Inamura, 2009; Moir & Sudarsanam, 2007; Ismail, 2014).

Companies that do not respect financial covenants are subject to a renegotiation of the debt, higher contractual interest rates, and additional mandatory guarantees (Press & Weintrop, 1991; Beneish & Press, 1993; Borges, 1999; Silva, 2008; Prilmeier, 2017), as well as the possibility of the reclassification of the short-term balance of the debt to a long-term debt in accordance with CPC 26 (R1) – Presentation of Financial Statements (2011).

In general, companies with higher levels of risk and fewer control mechanisms are more likely to have conflicts of interest, with governance performing the important role of reducing the risk and cost of contracts (Caixe & Krauter, 2014). In this case, corporate governance together with financial covenants play important roles in reducing agency problems associated with the debt contracts (Bakar, Mather & Tanewski, 2012). Given the complementary relationship between these mechanisms, the literature presents evidence that companies which adopt best practices in terms of corporate governance have lower costs and greater capacity in terms of financing (Funchal & Monte-Mor, 2016) as well as less restrictive contractual clauses (Klock, Mansi & Maxwell, 2005; Li, Qiu & Wan, 2011; Xi, Tuna & Vasvari, 2014).

This work expands on the discussions in the literature that analyze the relationship between governance and restrictive clauses based on an *ex-post* perspective of contracts. This is because results such as those of Palhares, Carmo, Ferreira and Ribeiro (2019) and Konraht and Vicente (2019) have investigated the impact of corporate governance on the inclusion of financial covenants in the issuing of debentures. Thus, it is necessary to investigate whether the complementary relationship between governance and financial covenants persists after contracts are written, with governance therefore influencing the management of financial covenants in terms of the non-violation of these clauses. In this case, this study intends to answer the following question: do firms with greater levels of governance present a lower probability of violating financial covenants? Specifically, this work seeks to analyze whether publicly traded Brazilian companies in B³'s differentiated levels of governance have a lower probability of violating financial covenants.

Corporate governance is made up of mechanisms that encourage managers to make decisions which will maximize the value of a firm (Denis & McConnell, 2003; Ulum, Wafa, Karim & Jamal, 2014). From a debt contract perspective, governance is instituted through managerial tools and business requirements and the dissemination of information which brings the interests of shareholders and creditors more in line with each other, reducing conflicts of interests between the parties involved (Minadeo, 2018).

Among the various control and monitoring mechanisms, the Brazilian literature has used the B³'s differentiated governance levels as a *proxy* for corporate governance to the extent that these levels (Level 1, Level 2 and New Market) consider items that involve the monitoring performed by the board, liquidity mechanisms, and the dilution of shareholder control as mandatory requirements (B3, 2020). In addition, firms listed with these governance levels are more conservative in their approach to accounting, are more highly valued by the market, and have reduced operational costs (Almeida, Scalzer & Costa, 2008; Caixe & Krauter, 2014).

If it is verified that higher levels of B3 governance reduce the probability of financial clause violations in debt contracts, the evidence supports the use of B3 levels as a *proxy* for governance in contexts in which there is a conflict of interest between the involved parties. In practice, these levels can also be used to provide complementary information to creditors in the evaluation of contractual risks and as a factor which supports and justifies the need for the inclusion of more restrictive financial covenants in debt contracts.

In order to identify whether companies with B³'s differentiated levels of corporate governance have a lower risk of violating financial contracts, we obtained 1,310 observations of 206 publicly traded Brazilian companies, obtaining their accounting and governance data from the B³ website's database Economatica. Information about financial covenants was obtained through manual collection from the explanatory notes of each of the sample firms. Based on this database, companies with different levels of governance were compared using t-tests of differences between means, and logistic regressions with year fixed effects were used to verify the relationship between the B³'s differentiated levels of governance and the probability of a firm's violating financial covenants.

In general, the obtained results demonstrate that companies listed in Levels 1, 2 and New Market have a lower probability of violating financial covenants in debt contracts compared to other companies that are not listed. This result indicates that governance mechanisms not only influence the inclusion and level of restrictive financial covenants (Palhares *et al.*, 2019; Konraht & Vicente, 2019), but also monitor the actions of managers in terms of indicators associated with financial covenants. In this case, it was verified that these B³ governance levels can be used as a *proxy* for governance in studies which examine the presence of conflicts of interest between the parties involved in debt contracts.

The contributions of this study further extend to a practical perspective to the extent that they support and justify the inclusion of more restrictive financial clauses in debt contracts for companies that are not listed in B³'s differentiated levels of corporate governance. In practice, these levels can be used as complementary information for creditors in evaluating contractual risks and as a factor in the support and justification of a need to include financial covenants in debt contracts (Beiruth, Fávero, Murcia, Almeida & Brugni, 2017).

2 THEORETICAL REFERENCES

2.1 Financial covenants

Financial institutions, in addition to demanding traditional guarantees in providing loans, use other monitoring instruments such as covenants (Borges, 1999). Specifically, covenants are clauses inserted in debt contracts that seek to protect the interests of the creditors (Inamura, 2009). The inclusion of these clauses is related to the monitoring due to the agency conflicts associated with the transactions and the need for additional information about the companies which are receiving the loan (Inamura, 2009; Demerjian, 2017; Prilmeier, 2017). In other words, the inclusion of covenants in debt contracts seeks to transmit private information to the creditors about the company's financial projections, thus reducing the asymmetry of information (Demiroglu & James, 2010).

Restrictive financial clauses represent an important part of debt contracts and they are generally based on the debtor's accounting information, and are generally expressed as accounting indices which have bands which are previously defined in these contracts (Demiroglu & James, 2010). These clauses impose direct restrictions on the financial activities and investments of the debtor, which serve as a mechanism which limits the discretionary actions of managers and protects investors in terms of the company's operational continuity and ability to make long-term payments (Chava, Fang, Kumar & Prabhat, 2019). In terms of examples of these restrictive financial clauses, we can cite capital covenants and performance covenants which accompany the financial and operational performance of these companies (Christensen & Nikolaev, 2012).

There are other clauses which are also explored by the literature as financial covenants. Nini, Smith & Sufi (2009), for example, present six classes of covenants in Canadian firms: balance sheet debt, debt coverage, cash flow, liquidity, and net asset debt and EBITDA covenants. In American companies, Prilmeier (2017) lists financial covenants based on balance sheet debt, debt coverage, payment capacity and EBITDA. In Brazil, Duarte and Galdi (2018) have identified financial covenants in debt contracts related to EBITDA, net revenues, net debt, debt coverage, financial expenses, current account liquidity, and investment restrictions, with these clauses being related to the types of financial covenants used in the Canada and the United States.

Independent of which indicator is used, violating financial covenants generally leads to negative implications for companies, such as an anticipated expiration of a loan, higher interest rates in a debt renegotiation, new guarantees, and penalties which affect cash flow and even operational continuity (Press & Weintrop, 1991; Beneish & Press, 1993; Borges, 1999; Silva, 2008; Prilmeier, 2017). In Brazil, in accordance with CPC 26 (R1), companies which violate a covenant are obliged to reclassify the remaining debt balance as short-term and release an explanatory note. In this sense, managers are encouraged to avoid the triggering of these clauses (Costa, Matte & Monte-Mor, 2018).

As an example, it has been verified that there are studies which indicate that companies which present better quality in their financial reports and greater corporate social responsibility have fewer financial covenants in their debt contracts (Costello & Moerman, 2011; Shi & Sun, 2015). Other results indicate that firms which recognize more losses have more financial covenants in their debt contracts (Nikolaev, 2010), and that the proximity of violating financial covenants influences managers to make accounting choices to avoid this violation and the losses it generates (Iatridis & Kadorinis, 2009; Silva, 2008; Franz, Hassabelanby & Lobo, 2014; Beiruth *et al.*, 2017; Duarte & Galdi, 2018). In the following subsection, we will explore the role of governance as a complementary actor to financial covenants in the reduction of agency conflicts between the parties involved in debt contracts.

2.2 Corporate governance and financial covenants

The goal of corporate governance is to diminish agency problems in the private and public sectors (Miglani, Ahmed, & Henry, 2015; Dawson, Denfrod, Williams, Preston & Desouza, 2016), and it is used to guarantee shareholder returns on investment (Shleifer & Vishny, 1997). The companies which implement the best practices of corporate governance project greater security to investors, reflected in the valorization of their operational efficiency and a reduction in agency costs (Robicheaux, Fun & Ligon, 2007; Silva, Santos & Almeida, 2011; Gondrige, Clemente & Espej, 2012; Sonza & Kloeckner, 2014; Mapurunga, Ponte & Oliveira, 2015; Baioco & Almeida, 2017; Machado & Gartner, 2018).

In addition, the adoption of the best practices in corporate governance influences the size and quality of profits, a reduction in earnings management, lower bank debt and debt finance costs, leading companies to use more short-term rather than long-term debt, with short-term debt disciplining manager decision making (Silva *et al.*, 2011; González & García-Meca, 2014; Maranho & Leal, 2018; Nisiyama & Nakamura, 2018).

Palhares *et al.* (2019) have identified that the size of the administrative board and the concentration of ownership are fundamental factors in terms of the number of financial covenants inserted in debt contracts. They also found that the concentration of ownership and the size and independence of the administrative board influence how restrictive net debt / EBITDA financial covenants are (Palhares *et al.*, 2019). These governance mechanisms are highlighted as factors analyzed *ex-ante* contracts are signed and are related directly to the rules implemented by the B3 in terms of the minimum requirements for being classified in their differentiated levels of corporate governance as depicted in Figure 1.

The governance levels of the B³ consist of Traditional, Bovespa +, Level 1, Level 2 and New Market and are designed to improve the evaluations of those companies who voluntarily adhere to these respective levels (B³, 2020). As can be seen in Figure 1, companies in the New Market and Level 2 classifications need to have at least five members on their administrative boards and at least 20% should be independent and have a unified mandate of up to two years. Companies in Level 1, together with those in the New Market and Level 2, have restrictions in terms of who can be appointed a board member, and beginning in 5/10/2011 the chairman of the board, the president or chief executive must have at least three years in one of these positions before acquiring the other positions.

In addition to control mechanisms in terms of the composition of the board, companies listed in Level 1, Level 2 and the New Market need to have at least 25% of their shares in free float circulation to guarantee share ownership dispersion (B³, 2020). These points are related directly to the results of Palhares *et al.* (2019), who identify that the size of the administrative board and the concentration of ownership are fundamental factors in the number of financial covenants inserted into debt contracts.

In this instance, the B³'s differentiated levels of governance (Level 1, Level 2 and New Market), because they consider mandatory requirements that involve the monitoring performed by the board and liquidity mechanisms and share ownership dilution, make it possible to limit the discretionary actions of managers, which reduces the chances of financial covenants being violated, from which we derive this study's hypothesis:

H_1: Brazilian companies listed in the B³'s differentiated levels of corporate governance are less likely to violate the financial covenants established in debt contracts.

	NEWMARKET	LEVEL 2	LEVEL 1	BOVESPA +	TRADITIONAL
Characteristics of Issued Shares	Only permits the existence of common shares	Permits the existence of common and preferred shares (with additional rights)	Permits the existence of common and preferred shares (in accordance with legislation)	Only common shares can be negotiated and issued, but preferred shares are permitted	Permits the existence of common and preferred shares (in accordance with legislation)
Minimum Percentage of Shares in Circulation (free float)	At least 25% free float			25% free float until the 7th year on the listing, or minimum liquidity conditions	There are no rules
Public Distribution of Shares	Efforts made to Increase Share Dispersion			There are no rules	
Approval of statutory dispositions (beginning 5/10/2011)	Limiting vote with less than 5% of capital, qualified quorum and "fixed clauses"		There are no rules		
Composition of the Administrative Board	Minimum of 5 members, of which at least 20% should be independent with a unified mandate of up to 2 years		Minimum of 3 members (in accordance with legislation)		
Approval of accumulation of positions (beginning 5/10/2011)	Chairman of the Board and President or Chief Executive held by the same person (only 3 years after joining)			There are no rules	
Administrative Board Obligations (beginning 5/10/2011)	Response to any public offer to acquire the company's shares		There are no rules		
Financial Statements	Translated into English		In accordance with legislation		
Annual public meeting and calendar of corporate events	Mandatory			Optional	
Additional release of information (beginning 5/10/2011)	Securities trading policy and code of conduct			There are no rules	
Tag Along Rights	Granted 100% for common shares	Granted 100% for common and preferred shares Granted 100% for common shares and 80% for preferred shares (until 5/9/2011)	Granted 80% for common shares (in accordance with legislation)	Granted 100% for common shares	Granted 80% for common shares (in accordance with legislation)
Public offer to acquire shares at a minimum economic value	Mandatory when delisting or leaving segment		In accordance with legislation	Mandatory when delisting or leaving segment	In accordance with legislation
Joining the Market Arbitration Chamber	Mandatory		Optional	Mandatory	Optional

Figure 1. Criteria necessary for a company to be classified in the B3's differentiated levels of governance
Source: *Bússula do Investidor* (2020)

The literature also presents various benefits derived from adhering to the B3's differentiated levels of corporate governance such as: an increase in a company's market value (Rossoni & Silva, 2013; Clemente, Antonelli, Scherer & Mussi, 2014); an increase in the precision of analyst forecasts (Dalmácio, Lopes, Sarlo Neto & Rezende, 2011); a company's improved institutional image (Nardi & Nakao, 2008); greater abnormal returns in mergers and acquisitions (Silva, Kayo & Nardi, 2016); and a lower cost of debt financing and less restrictive covenants (Klock *et al.*, 2005; Li *et al.*, 2011), among others. These results corroborate the role exercised by governance in reducing agency problems associated with the formation of debt contracts (Bakar *et al.*, 2012).

Given the complementary relationship between governance and financial covenants in the limiting of discretionary actions by managers and the mitigating of agency conflicts, the proposition envisioned in Hypothesis 1 extends the discussions in the literature by analyzing the relationship between governance and restrictive clauses based on an *ex-post* perspective, after the generation of contracts, with governance exercising an influential role in managing financial covenants that seek to ensure that financial clauses in debt contracts are not violated.

3 METHODOLOGY

3.1 Data collection and sample

It was necessary to develop a specific database for the explanatory variable through a manual collection of explanatory notes downloaded from the B³ website and sample company websites using the keywords "covenants", "clauses", "restrictive", "agreements" and "indices" to identify covenants in the explanatory notes of bank debt contracts, in accordance with the study developed by Duarte and Galdi (2018).

To conduct this study, we considered openly traded non-financial Brazilian companies listed on the B³, during the post-IFRS period from 2010 to 2018. The post-IFRS period was selected because the IFRS altered the pattern of including financial covenants in debt contracts (Beiruth *et al.*, 2017). The final sample consists of 1,310 observations in an unbalanced panel of 206 companies, in accordance with the data cleaning presented in Table 1.

Table 1. Data sample selection process

Action performed	Nº Obs.
Total number of observations downloaded from Economatica	3,053
Removal of observations where explanatory notes were not found	(533)
Removal of observations of companies which did not voluntarily announce whether they have or do not have financial covenants	(601)
Removal of observations with negative liquid assets	(297)
Removal of observations of companies that do not have financial covenants	(271)
Removal of companies that do not have bank debts for the year of observation	(21)
Removal of observations without EBITDA data	(20)
Final sample	**1,310**

Source: prepared by the author

Sample observations in which the company did not inform in their explanatory notes whether they have or do not have financial covenants were removed, taking into account that Brazilian companies are required to release this information when a financial covenant has been violated according to CPC 26 (R1). Appendix A presents in detail the number of companies which had covenants and the number which violated these clauses per year, according to information in their explanatory notes.

To identify the differentiated levels of corporate governance, the B³ classification of June 18, 2018 was used and the adhesion date for the segment in the respective company classification levels and years, as displayed in Table 2.

Table 2. Number of sample observations of with B³ corporate governance levels

Classification	B³ Levels	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Not listed and undifferentiated levels	Not listed	51	52	61	64	70	70	69	67	63	567
	Traditional	7	6	6	6	7	7	7	6	6	58
	Bovespa +	0	0	1	1	1	1	1	1	1	7
Differentiated levels	Level 1	12	12	14	15	15	14	15	15	15	127
	Level 2	4	6	6	8	7	5	8	8	10	62
	New Market	40	48	53	56	57	57	54	62	62	489
Total de observações		**114**	**124**	**141**	**150**	**157**	**154**	**154**	**159**	**157**	**1310**

Source: prepared by the author

3.2 Empirical design

To test Hypothesis 1 that companies listed in the differentiated levels of corporate governance have a lower probability of violating financial covenants established in debt contracts, the Student t-test of means was performed to see whether on average companies listed in the B3 differentiated levels of governance (Level 1, Level 2 or New Market) violated financial covenants less often than companies not listed in these levels. Then a logistic regression with year fixed effects (Equation 1) was used, which makes it possible to identify whether companies listed in the differentiated levels of corporate governance presented a lower probability of violating financial covenants. The year fixed effect was inserted to capture shocks which could lead companies to violate restrictive clauses due to market issues beyond the firm's managerial decisions. According to Hypothesis 1, it is expected that companies listed in the differentiated levels of corporate governance have a lower probability of violating financial covenants, or in other words, that coefficient β_1 is negative.

$$Probability\ (Violation_{it} = 1/X) = 1/(1+e^{-z}) \qquad (1)$$

with $Z= \beta_0 + \beta_1\ Differentiated\ Levels\ of\ Corporate\ Governance_{it} + \sum_k \beta_k\ Contols_{it}^{k} + \varepsilon_{it}$,

and the variables used can be described as follows:

$Violation_{it}$: dummy variable equal to 1 if company *i* violated at least one financial covenant in period *t*, and 0 if not;

$Differentiated\ Levels\ of\ Corporate\ Governance_{it}$: a dummy variable which represents the differentiated levels of corporate governance, assuming a value of 1 if company *i* belongs to one of the differentiated levels of corporate governance (Level 1, Level 2 or New Market), and 0 if it does not.

In order to control for the existence of possible heterogeneities among the sample companies, the Equation 1 model also considers size, the level of earnings management, leverage, the net revenue growth rate, and the rate of return of companies, in accordance with the variables described in the following subsection.

3.3 Control variables

The variable *Size* is measured by the natural logarithm of a company's total assets. It is expected that larger companies influence the inclusion of less restrictive financial covenants and present a lower probability of violating financial covenants (Freudenberg, Imbierowicz, Saunders & Steffen, 2011; Bakar *et al.*, 2012; Dahrawy, Ghany & Mohamed, 2015; Palhares *et al.*, 2019).

Earnings management is calculated based on Dechow, Sloan & Sweeney's model (1995) to measure the level of discretionary accruals. When companies are close to violating financial covenants, they present greater earnings management (Iatridis & Kadorinis, 2009; Silva, 2008; Franz *et al.*, 2014; Duarte & Galdi, 2018).

The variable *Leverage* is calculated based on dividing a company's liabilities by its equity. It is expected that companies with higher levels of leverage have more restrictive financial covenants and are more likely to violate financial covenants (Freudenberg *et al.*, 2011; Bakar *et al.*, 2012; Dahrawy *et al.*, 2015; Palhares *et al.*, 2019).

The variable *Growth* is calculated by the variation in net revenues. It is expected that growing companies present more restrictive financial covenants (Freudenberg *et al.*, 2011; Bakar *et al.*, 2012). The variable Rate of return is calculated by dividing EBITDA by the average value of total assets. It is expected that Rate of return negatively influences the number and level of financial covenant restrictions (Shi & Sun, 2015; Emira & Amel, 2015). All of the control variables are described below and presented in Table 3.

Table 3. Variables used in the model

Variables	Sign	Definition	Data source
Explained			
Violation		Violation dummy, which is equal to 1 if the company has violated at least one financial covenant, and 0 if it has not.	Explanatory notes
Explanatory			
Differentiated levels of corporate governance	(-)	Corporate governance dummy, which is equal to 1 if the company is listed in the B³ corporate governance levels, and 0 if it is not.	B³
Control			
Size	(-)	Natural logarithm of total assets	Economatica
Earnings management	(-)	Level of discretionary accruals measured by Dechow *et al.*'s model (1995)	Economatica
Leverage	(+)	Liabilities divided by equity	Economatica
Growth	(+)	Progression of total assets.	Economatica
Rate of return	(-)	EBITDA divided by average total assets	Economatica

Source: prepared by the author

4 ANALYSIS OF THE RESULTS

4.1 Descriptive statistics

Table 4 presents the descriptive statistics of the variables used in the logistics model. We can verify through the descriptive statistics that the average *Violation* was 0.1496, or in other words, approximately 15% of the sample observations have violated a financial covenant during the period from 2010 to 2018. The explanatory variable *Differentiated Levels of Corporate Governance* had an average value of 0,5229, which indicates that 52% of the sample is made up of companies listed on the B³ corporate governance levels Level 1, Level 2, and New Market.

The companies that make up the sample present an average of 15.41 in terms of the logarithm of total assets, have -0.0009 mean discretionary accruals, have committed on average 1.2 times their liquid assets in liabilities, have reduced their sales on average 6.86%, and present an average rate of return of 12% per year. These values are in line with the results presented in other articles which use data for Brazilian companies during the analyzed period.

Table 4. Descriptive statistics

Variables	Average	Standard Deviation	Minimum	Maximum
Violation	0.1496	0.3568	0	1
Differentiated levels of corporate governance	0.5229	0.4997	0	1
Size	15.4173	1.3479	12.1141	19.1846
Earnings management	-0.0009	0.0933	-0.2633	0.3366
Leverage	1.2152	1.7589	0.0698	13.0236
Growth	-0.0686	0.1367	-0.5847	0.2296
Rate of Return	0.1190	0.0960	-0.1331	0.4578

Source: prepared by the author

4.2 Student t-test

Table 5 presents the results of the parametric mean Student t-test. It was initially identified by an intermediary variance equality F test which determined whether the groups listed in and the groups not listed in the B3 differentiated levels have different variances. Performing the t-test for differences between means for groups with distinct variances, verified that there is a significant difference between the means for non-listed and listed companies in terms of the B3 differentiated levels of 0.0290. This result demonstrates the initial evidence that companies not listed in the B³'s differentiated levels of corporate governance on average violate financial covenants more often than companies listed in the differentiated levels.

Table 5. Student t-test

Violation of financial covenants			
Groups	**N**	**Mean**	**Standard Deviation**
Not listed in the differentiated levels	625	0.1648	0.3713
Listed in the differentiated levels	685	0.1358	0.3428
Difference		**0.0290***	

Source: prepared by the author

Note: * 10%,** 5%, and *** 1% of significance.

Even though this result supports Hypothesis 1 of this study, it is limited to the comparison of averages, and does not take into account the existing heterogeneity between the considered groups. The results of the logistic model in accordance with Equation 1 are presented in the next subsection, and they make it possible to take these differences into consideration.

4.3 Regression analysis

Table 6 presents the results of the study's logistic model, which was presented in Equation 1. It should be noted that initially the study's model presented good quality estimates of the probability of violations of financial covenants, to the extent that it does not reject the goodness of fit hypothesis of the Hosmer-Lemeshow test (prob > chi2 = 0.5586), that the area above the ROC curve is equal to 0.73 and that 86% of the observations were classified in the proper manner.

The results presented in Table 6 consider all of the sample's 1,310 observations and indicate that this study's hypothesis cannot be rejected at a confidence level of 95%. In verifying the negative sign and significance of the β_1 coefficient, this demonstrates that the companies listed in Levels 1, 2 and New Market have a lower probability of violating the financial covenants established in debt contracts compared with companies which are not listed in these respective levels. This result corroborates the evidence presented by the Student t-test and supports this study's hypothesis that Brazilian companies listed in the B³'s differentiated levels of corporate governance present a lower probability of violating financial covenants established in debt contracts.

These results are in line with the international and national literature which indicates that companies with higher levels of corporate governance have fewer and less restrictive financial covenants in debt contracts (Li *et al.*, 2011; Bakar *et al.*, 2012; Xi *et al.*, 2014; Dahrawy *et al.*, 2015; Konraht & Vicente, 2019; Palhares *et al.*, 2019).

Table 6. Results of the logistic regression

$Violation_{it}$	Coefficient	p-Value
Differentiated levels of corporate governance	-0.4364	0.014**
Size	-0.0098	0.882
Earnings management	-2.5892	0.009***
Leverage	0.1902	0.000***
Growth	0.8970	0.249
Rate of return	-7.6638	0.000***
Constant	-0.8092	0.431
Year Fixed Effects	Yes	
Observations	1,310	
R^2	0.1211	
White's test	Prob > chi2 = 0.5586	
ROC curve	0.7306	
Classification table	86.03%	

Source: prepared by the author
Note: * 10%,** 5%, and *** 1% of significance.

Table 7 presents the probability of the event occurring, demonstrated by an odds ratio of the chance of a company listed in B3's corporate governance levels Level 1, Level 2 or the New Market violating a financial covenant, which is 35.36% less than a company not listed in these levels. Analyzing the marginal effects, there is a 12.70% chance of a company violating a covenant, but if the company is listed in one of the B3's differentiated levels of corporate governance, its probability of violating falls an average of 0.0488 percentage points.

Table 7. Chances of violating a financial covenant

Variables	Odds Ratio	p-Value	Marginal Effect	p-Value
Differentiated levels of corporate governance	0.6464	0.014**	-0.0489	0.030**
Size	0.9903	0.882	-0.0011	0.887
Earnings management	0.0751	0.009***	-0.2870	0.574
Leverage	1.2095	0.000***	0.0211	0.562
Growth	2.4521	0.249	-0.0994	0.572
Rate of return	0.0005	0.000***	-0.8495	0.562
Probability of violating a covenant			**0.1270**	

Source: prepared by the author
Note: * 10%,** 5%, and *** 1% of significance.

Through the results from the control variables, we have identified that companies with a higher level of earnings management present a lower probability of violating financial covenants, which is in keeping with the findings of Iatridis and Kadorinis (2009), Silva (2008), Franz *et al.* (2014) and Duarte & Galdi (2018).

This result suggests that managers have incentives to effect discretionary accounting strategies when they are close to violating financial covenants which is when corporate governance is even more important to discipline discretionary actions by managers in the management of indicators inherent in restrictive clauses. Consistent with this point, it was verified that the level of a company's rate of return reduces the probability of violating a financial covenant (Shi & Sun, 2015; Emira & Amel, 2015).

On the other hand, more leveraged growing companies are more likely to violate financial covenants, which is in line with the findings of Freudenberg *et al.* (2011), Bakar *et al.* (2012) and Palhares *et al.* (2019), who demonstrate that growing leveraged companies have a greater number of financial covenants and greater restrictions in terms of their respective limits.

In general, this study's results are in line with the role of corporate governance in disciplining the actions of managers and mitigating agency problems. The contributions of this study extend to a practical perspective to the extent that they support and justify the inclusion of more restrictive financial clauses in debt contracts for companies which are not listed in B^{3}'s differentiated levels of corporate governance. In practice, these levels can be used as complementary information by creditors in the evaluation of contractual risks and as a factor which supports and justifies the need to include financial covenants in debt contracts (Beiruth *et al.*, 2017).

Specifically from an academic perspective, these results support the use of the B^{3}'s differentiated levels of corporate governance as a *proxy* for governance to the extent that they suggest that companies listed in B^{3}'s differentiated levels (Level 1, Level 2 and New Market) have a lower probability of violating financial covenants. This expands on the results of Palhares *et al.* (2019), which point out the size of the administrative board and the concentration of ownership as factors which influence the number of covenants inserted in debt contracts.

These monitoring mechanisms, which are directly related with the rules implemented by the B3 in terms of minimum requirements to be classified in these differentiated levels of governance, demonstrate not only that B^{3}'s differentiated levels of governance can be used as a *proxy* for corporate governance within the context of debt contracts, but that the structure of B^{3}'s differentiated levels of corporate governance complements financial covenants beyond the formation of these contracts. This is because they indicate which structure will help limit discretionary actions by managers in relation to the management of accounting indices *ex-post* the confection of contracts in order to avoid violations of these restrictive financial clauses.

5 CONCLUSIONS

This study has sought to analyze whether openly traded Brazilian companies listed in the differentiated levels of corporate governance have a lower probability of violating financial covenants established in debt contracts. The study's results demonstrate that companies listed in B3's differentiated levels of corporate governance have a lower chance of violating financial covenants established in debt contracts than companies which are not listed in these respective levels. This result is in line with the findings of the international and national literature that investigates the influence of adopting the best practices of corporate governance to limit the discretionary actions of managers and mitigate agency conflicts.

Specifically, the results support the use of the B3's differentiated levels of corporate governance as a *proxy* for corporate governance in contexts in which there are conflicts of interest between the parties involved, as in the case of debt contracts. This indicates that the governance structure is not only complementary to financial covenants during the formation of these contracts as well as agency conflicts, but also helps limit discretionary actions by managers in relation to the management of accounting indices *ex-post* the confection of contracts to avoid violations of restrictive financial clauses.

During the development of the covenant database, some companies were identified which presented bank debts on their balance sheets and did not state whether they had financial covenants in accordance with CPC 26 (R1) or not. This point, even though it is a limitation of the study's database, is also a warning that discussions about covenant details stipulate mechanisms which allow stakeholders to have greater access not only to the violation conditions, but also the characteristics of the debt contract's clauses. In terms of new research, it would be of interest to analyze which types of specific discretionary actions are limited by increasing levels of governance in accordance with the requirements for each level of the B3.

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APPENDIX A - Points analyzed during the data collection for the dependent variable

Points	Number of observations									
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Total**
Announced whether it had or did not have covenants in the explanatory notes	157	172	187	193	204	210	216	220	220	1,779
Did not announce whether it had or did not have covenants in the explanatory notes	86	73	64	65	59	64	63	58	69	601
The explanatory notes were not located	23	28	25	24	28	20	22	26	15	211
Total observations	**266**	**273**	**276**	**282**	**291**	**294**	**301**	**304**	**304**	**2,591**
Had a covenant in the explanatory notes	143	154	167	171	180	186	191	197	200	1,589
Did not have a covenant in the explanatory notes	14	18	20	22	24	24	25	23	20	190
Total observations	**157**	**172**	**187**	**193**	**204**	**210**	**216**	**220**	**220**	**1,779**
Had a financial covenant in the explanatory notes	135	145	157	161	169	170	177	183	186	1,483
Only had non-financial covenants in the explanatory notes	8	9	10	10	11	16	14	14	14	106
Total observations	**143**	**154**	**167**	**171**	**180**	**186**	**191**	**197**	**200**	**1,589**
Violated a financial covenant	15	19	25	24	31	40	32	34	31	251
Did not violate a financial covenant	120	126	132	137	138	130	145	149	155	1,232
Total observations	**135**	**145**	**157**	**161**	**169**	**170**	**177**	**183**	**186**	**1,483**