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Tatiana Albanez

University of São Paulo, School of Economics, Business and Accounting – FEA/USP

Rafael Schiozer

Fundação Getulio Vargas, School of Business Administration – FGV/EAESP

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Tatiana Albanez
University of de São Paulo
School of Economics, Business and Accounting
tatiana.albanez@usp.br

Rafael Schiozer
Fundacao Getulio Vargas
Sao Paulo School of Business Administration
Rafael.schiozer@fgv.br

***Abstract**: This article examines the presence of covenants in the debt contracts of companies listed on the Brazilian B3 Exchange, to verify whether there is a relationship between the presence of covenants, the financial condition of firms and the quality of corporate governance, and also evaluates the distance to breach of the main covenants (covenant slack). The data on covenants were collected manually, directly from the explanatory notes to the financial statements of Brazilian nonfinancial companies listed on the B3 from 2007 to 2017. We identified 15 types of covenants in the explanatory notes related to loans, bonds, and financial leasing, with the standouts being the ratios Net Debt/EBITDA and EBITDA/Interest Expense, which together accounted for nearly 60% of the covenants observed. On average, the limits established of these ratios for the firms listed on the B3 were 3.4 and 1.8, respectively. Approximately 30% of the covenants were breached (i.e., the threshold was exceeded) in the period analyzed, with greater incidence of breach in 2015 and 2016. We found that on average, Brazilian companies had adequate covenant slack during the period studied, and that it is important to analyze renegotiation and*

Keywords: Brazil, bonds, bond market, capital markets

JEL codes: G18, G30

1 – Introduction

Covenants are restrictive clauses contained in debt agreements, acting as limits on indebtedness and payment of dividends. These clauses originate from the conflict of interest between creditors and shareholders, serving as a mechanism to protect creditors by impeding expropriation by shareholders. The violation of covenants can trigger acceleration of the debt, and at the limit can allow the creditor to convert the debt into equity and even gain control of the company.

In this context, the main objectives of this article are to present a panorama of the presence of covenants in the debt agreements of the nonfinancial companies listed on the B3 and to identify the position of these firms with respect to such clauses, in the period from 2007 to 2017. More specifically, we describe the principal types of covenants contained in the firms' debt contracts; verify if a relationship exists between the presence of covenants, the financial condition of the firms and quality of corporate governance; and evaluate the distance to breaching the main covenants (covenant slack).

Through examination of the notes to the financial statements of the firms in the sample, we identified 15 types of covenants related to loans, financing, bond issues and financial leasing, with highlight on the ratios Net Debt/EBITDA and EBITDA/Interest Expense, which together represented almost 60% of the observations. On average, the threshold established for these indicators to the Brazilian firms listed on the B3 were 3.44 for Net Debt/EBITDA and 1.8 for EBITDA/Interest Expense. Among the companies that disclosed their position as measured by these ratios, the averages were 2.4 for the first and 3.6 for the second. On average, the companies were a good distance from exceeding the limits established for breaching the covenants, but with substantial dispersion of the ratios.

For the firms that disclosed the existence of one or more covenants, but not their position (the value of the ratio in the period), we estimated the figure based on data from their financial statements. For these firms, the average distance to breaching the covenants (or covenant slack) was a good deal lower than the average: the mean calculated for Net Debt/EBITDA was 3.37 – very near the average of all the covenants in the sample, or 3.44. We also found that in 30% of the observations the thresholds established by the creditors were surpassed, and the years with the most breached covenants were 2015 and 2016, years when Brazil was in recession. The greatest frequency of covenant breach was in the electric power sector, one of those most affected by the government's economic policies during the recession.

Besides this introduction, the paper is divided into three more sections. Section 2 describes the data source and variables analyzed; section 3 analyzes the frequency of the various ratios found, their severity and the relationship with the characteristics of the firms; and section 4 presents our final considerations.

2 – Data

The initial sample was composed of all Brazilian nonfinancial firms listed on the B3 in the period from 2007 and 2017, a total of 331 companies. After operationalization of the variables, we dropped the firms with zero leverage and with less than two consecutive years of data for analysis, so the final sample contained 277 firms and 2,541 observations (firm-years). For years when the firms presented zero leverage or negative net equity, the ratios were not calculated. After collecting the data and calculating the ratios, we winsorized the variables in the 1% and 99% percentiles to mitigate the effect of outliers.[1]

The accounting, financial and market data, used to calculate the traditional capital structure variables were obtained from the Economatica database. The data on covenants were collected manually from the B3 database, directly from the notes to the financial statements (as detailed shortly). Table 1 presents the traditional variables of firms' characteristics, used in studies of capital structure (Rajan & Zingales, 1995; Fama & French, 2002; Frank & Goyal, 2003; Myers, 2001; Baker & Wurgler, 2002).

To collect the data on covenants, we used the Maxqda software to read the PDF files containing the financial statements of the firms listed on the B3, focusing on the explanatory notes. We searched for the following keywords "*covenants(s)*" and *"cláusula(s) restritiva(s)*" ("restrictive clause(s)"), found to be present mostly in the notes on loans and financing. The search resulted in approximately 4,000 notes containing references to these words in the period, from which we collected data about the covenants mentioned in the notes[2].

In preparing the database related to covenants, we found the following cases:

1) The firm stated it had no covenants;

[1] This means that the observations whose values are lower than the first percentile of the distribution receive a value equal to that percentile for calculation of the means, and the observations above the 99th percentile receive a value equal to that percentile.
[2] The data were collected with the support of researchers of the Laboratory of Finance and Risk of FEA/USP – RiskFinLab.

Firm Variables		
Variable	**Operacionalization**	**Attribute**
Debt/Assets	Total Debt / Total Assets	Leverage
Ln(Assets)	Ln (Total Assets)	Size
Ln(Sales)	Ln (Sales)	Size
Fix. Assets/Assets	Fixed Assets / Total Assets	Tangibility
Ebit/Assets	EBIT / Total Assets	Profitability
ROI	(Net Profit + Int. Exp. Net of Inc. Tax) / (Debt + Net Equity)	Profitability
Market-to-book	Market Value of Assets / Book Value of Assets	Growth Opportunities
Liquidity	Current Assets / Current Liabilities	Liquidity
Own_Conc	% owned by the 3 largest shareholders with voting right	Ownership Concentration

Table 1: Firm variables – *Total Debt* is the sum of Loans, bonds and financial leasing obligations (short and long term); *EBIT* means earnings before interest and taxes; *ROI* denotes the return on investment, equal to the net profit plus Interest Expense net of income tax over total debt plus net equity at market value; *Market-to-book* is the ratio of assets at market value over assets at book value, where assets at market value is total assets minus net equity plus the market value of shares.

2) The firm reported it had covenants, but did not report the ratios that were stipulated by the creditors;
3) The firm reported it had covenants and identified the type of ratio, but not the threshold agreed with the creditors;
4) The firm reported it had covenants, identified the type of ratio and the threshold agreed with the creditor, but did not disclose the value at the end of the year (observed position);
5) The firm reported it had covenants, identified the type of ratio, the threshold agreed with the creditors, and disclosed the value at the end of the year (observed position). This was the most complete information, but very few companies presented this level of detail on covenants in the notes to the financial statements, as discussed in the next section.

For cases 1, 2 and 3, we performed qualitative analyses using dummy variables, while for the other cases we performed quantitative analyses by means of descriptive statistics.

All told, the covenants referred to 15 financial ratios, which can be segregated in two groups: balance sheet covenants and result covenants, as presented in Table 2.

In tabulating the data, when we found more than one clause with the same index (ratio), we used the following criteria, in this order: 1) consider the clause attributed to the most representative debt (largest); and 2) when it was impossible to identify the amount of the debt, consider the most restrictive clause, the criterion also used by Devos et al. (2017).

Restrictive Clauses (Covenants)	
Group 1 - Balance Sheet Covenants	
Net Debt / EBITDA	Net Debt / EBITDA
Dív. Bruta / EBITDA	Gross Debt / EBITDA
Net Debt / Net Equity	Net Debt / Net Equity
Gross Debt / Net Equity	Gross Debt / Net Equity
Net Eq. / TAotal Assets	Net Equity / Total Assets
CA / CL	Current Assets / Current Liabilities
Debt / TA	Debt / Total Assets
Net Debt / (Net Debt + Net Equity)	Net Debt / (Net Debt + Net Equity)
Net Curr. Debt / EBITDA	Net Current Debt / EBITDA
Curr. Debt / LT Debt	Current Debt / Long-term Debt
Group 2 - Result Covenants	
EBITDA / Int. Exp.	EBITDA / Interest Expense
EBITDA / Fin. Res.	EBITDA / Financial Result
EBIT / Int. Exp.	EBIT / Interest Expense
EBITDA / Sales	EBITDA / Sales
Invest / EBITDA	Investment / EBITDA

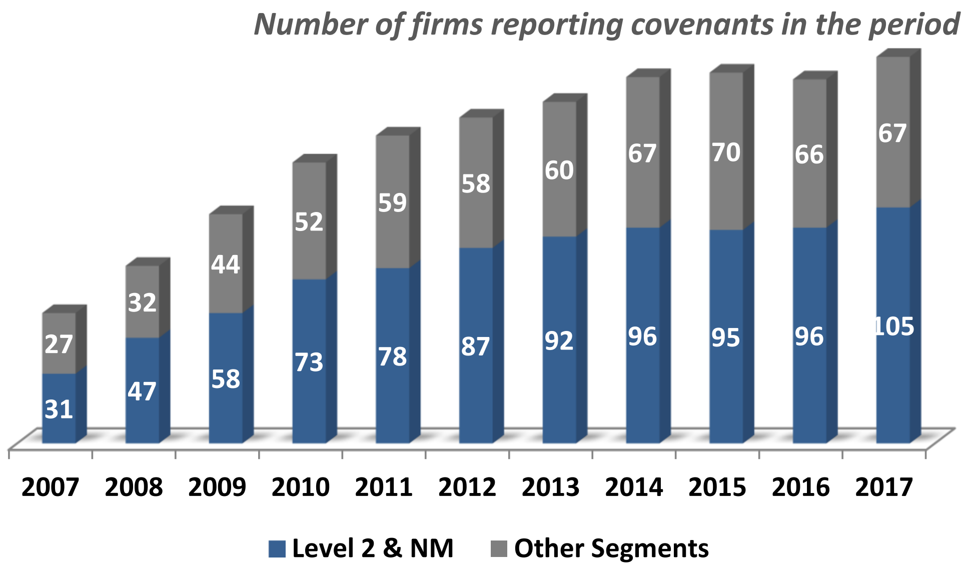
Table 2: Covenants disclosed in notes to the financial statements – firms listed on the B3 – Net Debt is equal to gross debt minus cash and banks; EBITDA is equal to earnings before interest, taxes, depreciation and amortization; EBIT is equal to earnings before interest and taxes.

3 – Overview of the presence of financial covenants of companies listed on the B3

3.1 – Frequency of covenants identified in the notes to the financial statements

Figure 1 presents the number of firms that reported the presence of covenants in debt contracts in each year, along with the number of firms that reported the ratio fixed by the creditors (threshold of the covenant). The total number of companies analyzed during the period studied was 277 (fixed panel of companies in the period from 2007 to 2017). An important limitation of the analysis is that when no information was present on the covenants, we could not distinguish whether a firm had debt contracts with covenants or if it did not disclose this information in the notes.

Figure 1 also shows that the disclosure of information on covenants increased during the period. In all the years, the number of firms listed in the Novo Mercado (“New Market”) and Level 2 trading segments of the B3, which require enhanced corporate governance (in blue), was greater than the number listed in the other segments (in gray), even though the firms in the first group only represented about 40% of the sample. This fact can be attributed to better disclosure quality of firms in the segments requiring enhanced governance. It also might be that the companies in the two high-governance segments had more covenants in their debt contracts because they were more leveraged.



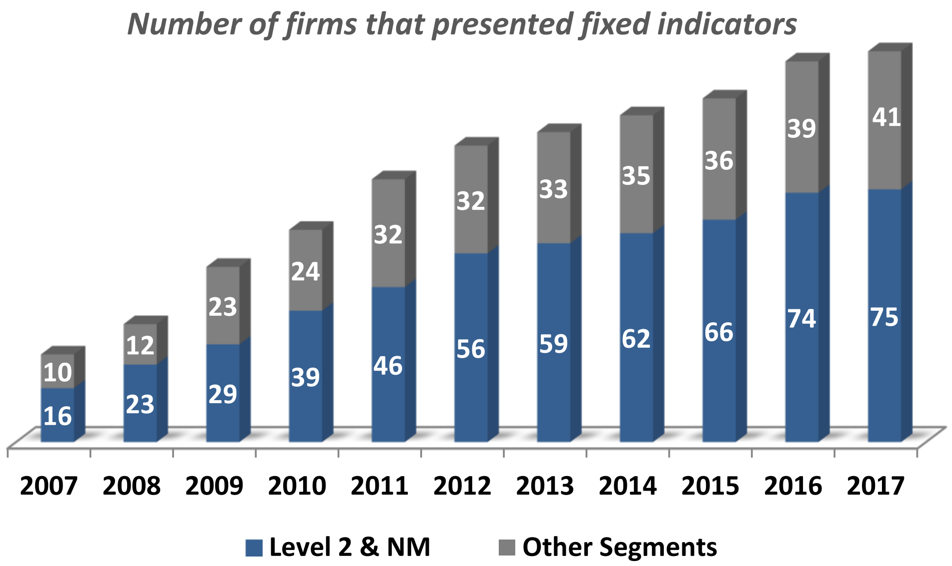


Figure 1: Firms listed on the B3 that reported having covenants – The first figure shows the number of firms that disclosed they were subject to covenants in debt contracts each year, separated into two groups: i) firms listed in the Novo Mercado and Level 2 trading segments of the B3 (enhanced governance – in blue); and ii) firms listed in the other governance levels (in gray). The second figure shows the number of firms that besides revealing covenants, identified the ratio or clause used by the creditors, also separated into governance levels. With the data over the study period, we analyzed a fixed data panel with 277 firms listed on the B3.

Curiously, the proportion of firms in the first group (Novo Mercado + Level 2) in the total of firms that disclosed covenants was virtually constant during the years, with about 60% each year (see the table in Appendix 2). Since the firms in the first group had already adopted international accounting standards (IFRS) as a requirement for listing in the enhanced-governance segments before the firms in the second group were required by law to adopt IFRS, in 2009 (partially) and 2010 (fully), it appears the growth of disclosure of covenants with time can be attributed to the mandatory adoption of IFRS.

The second graph in Figure 1 shows the number of firms that, besides disclosing having covenants, identified the ratio or clause used in the debt agreements. Approximately 40% of the firms stating they had covenants did not disclose the ratios used in the contracts, hampering a deeper analysis of the impact of the presence of covenants on the capital structure of these companies. Further in this respect, the firms with enhanced governance levels had a higher level of disclosure than the other firms.

Table 3 presents the most frequent types of covenants indicated in the explanatory notes related to loans and financing by the firms in the sample. There are a total of 1,843 observations of covenants, with two main types standing out: Net Debt/EBITDA (38.5%) and EBITDA/Interest Expense (20.7%), together representing nearly 60% of the covenants disclosed by the firms.

Ratio	Obs.	Freq. (%)
Net Debt / EBITDA	**709**	38,5%
Gross Debt / EBITDA	**75**	4,1%
Net Debt / Net Eq.	**89**	4,8%
Gross Debt / Net Eq.	**47**	2,6%
Net Eq. / TA	**86**	4,7%
CA / CLPC	**141**	7,7%
Debt / TA	**45**	2,4%
Net Debt / (Net Debt + Net Eq.)	**35**	1,9%
Net Curr. Debt / EBITDA	**17**	0,9%
Curr. Debt / LT Debt	**12**	0,7%
EBITDA / Int. Exp.	**381**	20,7%
EBITDA / Fin. Res.	**122**	6,6%
EBIT / Int. Exp.	**22**	1,2%
EBITDA / Sales	**55**	3,0%
Invest / EBITDA	**7**	0,4%
Total	**1843**	**100,0%**

Table 3: Frequency of covenants – Firms listed on the B3 – Description of the ratios used in the debt contracts. A single firm can have more than one restrictive clause in the same year, so the total number of ratios disclosed is greater than the number of firms disclosing the ratios (described in Figure 1). More details can be found in Table 4.

The first, Net Debt/EBITDA, reflects the capacity to pay debt from the operating cash flow generated; the higher the ratio, the greater will be the commitment of cash flow to pay debt. In turn, the second is considered an interest coverage ratio, measuring the capacity to pay interest from the cash flow, so that the greater this ratio is, the lower the commitment of cash flow to pay interest will be. All the other ratios have frequency lower than 10%, as shown in Table 3.

Figure 2 shows the frequency of the ratios during the years. Note that the use of Net Debt/EBITDA grew more than the others during the period studied.

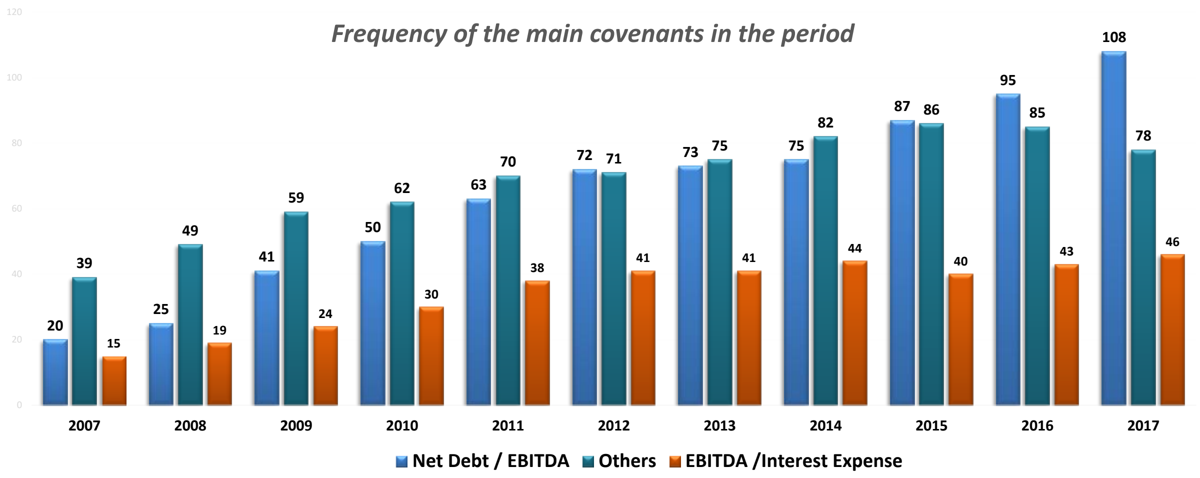


Figure 2: Frequency by type of covenant over the years – firms listed on the B3

3.2 – Analysis of the ratios disclosed and characteristics of the companies

Table 4 reports the number of observations (firm-years) of firms that presented 1, 2, 3 or more covenants in a determined year. Nearly half of the observations are of 2 covenants in debt contracts.

Intensity of Covenants			
	Firm-Year	Total	%
Only 1 Covenant	236	236	13%
2 Covenants	404	808	44%
3 Covenants	138	414	22%
More than 3	84	385	21%
TOTAL	**862**	**1843**	**100%**

Table 4: Intensity of covenants - Firms listed on the B3

Next, we analyze the existence of differences between the firms that disclosed covenants and the other companies. Table 5 presents the averages of the ratios of the firms, segregated between those that disclosed financial covenants (dummy for covenants = 1) and those that did not reveal any covenants (dummy for covenants = 0). We applied the T-test to analyze the differences of the means. Appendix 1 contains the additional descriptive statistics of the two groups, as well as the entire sample.

Variables	Total Sample		Without Covenants Dummy Cov = 0		With Covenants Dummy Cov = 1		T-test	
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Diff. Means	(t-value)
Debt/Assets	2532	0.30	1129	0.24	1403	0.34	-0.10	-15.50 ***
Ln(Assets)	2532	7.85	1129	7.09	1403	8.46	-1.37	-21.87 ***
Ln(Sales)	2492	7.14	1097	6.41	1395	7.72	-1.30	-19.28 ***
Fixed Assets/Total Assets	2532	0.27	1129	0.27	1403	0.27	-0.01	-0.58
EBIT/Assets	2532	0.07	1129	0.07	1403	0.07	-0.01	-1.78 *
ROI	2488	0.08	1112	0.08	1376	0.07	0.01	1.51
Market-to-book	2296	1.36	1020	1.36	1276	1.36	0.00	0.09
Liquidity	2541	1.88	1138	2.11	1403	1.69	0.43	7.94 ***
Ownership Concentration	2448	69.23	1095	70.93	1353	67.85	3.08	3.27

Table 5: Financial characteristics of the firms with and without covenants – *Debt/Assets* denotes the ratio between total gross debt (the sum of Loans, bonds and financial leasing obligations - short and long term) and total assets; *Ln(Assets)* is the natural logarithm of total assets, in millions of reais; *Ln(Sales)* is the natural logarithm of total sales, in millions of reais; *Fixed Assets/Total Assets* is the value of fixed assets (property, plant and equipment) divided by total assets; *EBIT/Assets* is the ratio between earnings before interest and taxes divided by total assets; *ROI* is return on investment, equal to the net profit plus Interest Expenses net of taxes divided by gross debt plus net equity at market value; *Market-to-book* is the market value of total assets divided by the book value of total assets, where the market value of assets is total assets minus net equity plus the market value of shares; *Liquidity* is equal to the ratio of current assets and current liabilities; and *Ownership Concentration* is equal to the percentage equity stake of the 3 largest shareholders with voting right.

The results in Table 5 show that the groups presented significant differences, mainly regarding the levels of leverage and metrics for size, profitability and liquidity. As expected, firms that disclosed covenants also had higher leverage (33.9% versus 24.2%), given the presence of restrictive clauses due to the greater debt levels. These firms also were larger than those without covenants, considering the ratios of size based both on total assets and sales, probably due to the fact that larger companies tend to have better accounting disclosure and take on a higher level of debt.

The greater profitability (*EBIT/Assets*) of firms with covenants could have been related to the greater acceptance of covenants based on the bottom-line results of these firms. Similar results were obtained by Devos et al. (2017) in analyzing American companies. In turn, the liquidity indicator (CA/CL) was smaller for the group of companies with covenants, possibly because of the greater financial sophistication in their management of liquidity, also leading to that result. The other ratios were similar between the two groups, with no significant differences in average terms.

As mentioned, 40% of the firms in the sample did not identify the ratios (covenant thresholds) considered in the debt agreements. Furthermore, among the firms that presented the ratios (clauses established with creditors), the majority did not identify the value of the ratio in the years (observed indicator), so it was not possible to ascertain the covenant slack for those companies.

Table 6 presents the descriptive statistics of the two most frequent ratios: *Net Debt/EBITDA* and *EBITDA/Interest Expense*. There were very small numbers of observations of the other ratios, preventing a more detailed analysis. We dropped observations with negative EBITDA in a determined year.[3]

Statistics	*Net Debt / EBITDA*		*EBITDA Interest Expense*	
	Covenant Limit	*Observed Ratio*	*Covenant Limit*	*Observed Ratio*
Mean	3.40	2.39	1.81	3.59
Median	3.50	2.50	1.75	3.95
Standard Deviation	0.76	2.21	0.47	3.91
Minimum	2.00	-10.20	1.00	-11.80
Maximum	6.20	5.35	3.50	15.02
Observations	581	61	287	50

Table 6: Analysis of the main covenants – *Covenant limit* refers to the limit (threshold) established in the debt contract and disclosed by the firm in financial statement notes; *Observed ratio* refers to the real ratio presented by the firm in a determined year. The number of observations with covenant limit disclosed is substantially smaller than the number of firms the disclosed the existence of covenants.

It can be noted in Table 6 that the average of the ratio *Net Debt/EBITDA* is 3.4, while that of *EBITDA/Interest Expense* is 1.8. It can also be observed that the firms that presented the calculated value of the ratio were on average far from breaching the established covenants.

3.3 – Analysis of the frequency of covenant breach and financial position of firms listed on the B3

To deepen the analysis of the position of the firms regarding the possibility or breaching the main covenants (*Net Debt/EBITDA* and *EBITDA/Interest Expense*), we estimated the values of these ratios for the firms that disclosed the existence of a clause established in the debt contract (covenant limit) but did not disclose the value of the ratio in a particular year (observed ratio). For the firms that disclosed both the existence of the clause and the value of the ratio, we

[3] This criterion was necessary because some firms could present a larger value of cash and cash equivalents than total debt, causing a negative numerator of the ratio Net Debt /EBITDA. When dividing this value by a negative EBITDA, the ratio's sign inverts, leading to spurious conclusions. Thus, when the ratio Net Debt /EBITDA is negative, the reason is that it had cash and cash equivalents greater than the total debt, meaning it is far from breaching the referred covenant.

considered the ratio revealed by the firm, since this should more often than not be the correct value by incorporating adjustments agreed with creditors.

Figures 3 and 4 show the frequencies of satisfying and breaching the covenants over the years. All told, for the *Net Debt/EBITDA* ratio, 174 of the 572 observations indicate breach (approximately 30% of the sample). For the ratio *EBITDA/Interest Expense*, 95 of the 291 observations were violation of covenants (approximately 33% of the sample). The highest frequencies of breaching covenants occurred in 2015 and 2016, for both indicators, possibly a reflection of the economic recession in those years, which affected firms' cash flow and debt levels.

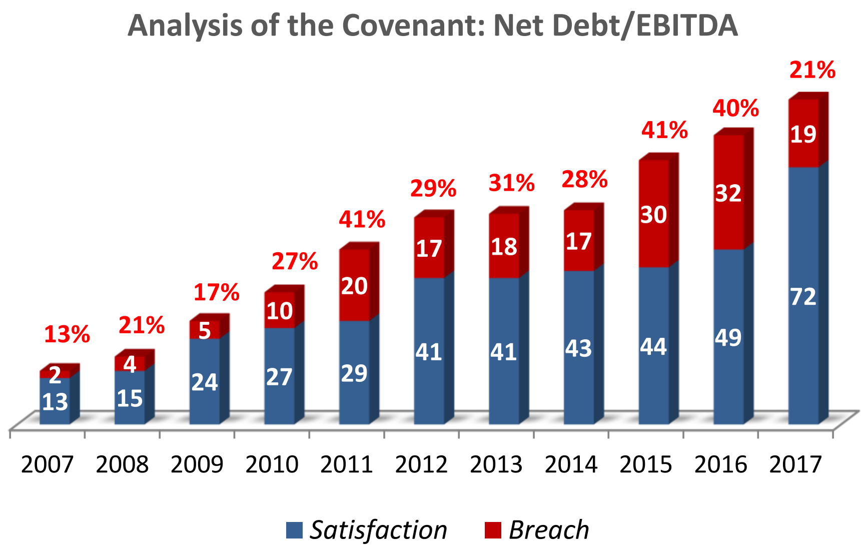


Figure 3: Breach of the covenant *Net Debt/EBITDA* over the years - Firms listed on the B3 that disclosed the covenant limits established – The figure presents the number of observations of covenants satisfied (in blue) and not satisfied (in red) each year. The percentages denote the ratios between the number of violated covenants and the total observations in each year. The number of observations with covenant limit disclosed is substantially lower than the number of firms that reported having covenants.

Tables 7 and 8 report the frequencies of breaching covenants by economic sector. For that purpose, we used the sectorial classification of the Economatica database. Of particular note is the highest frequency of breaching the covenant *Net Debt/EBITDA* by firms in the electric power sector (21% of the sample), a reflection of the high level of debt of companies in this sector, in particular during the recession years (2015 and 2016), while for the ratio *EBITDA/Interest Expense*, the highest covenant violation occurred in the textile sector (19% of the sample), a reflection of lower generation of cash flow during those recession years, especially because of lower output and exports.

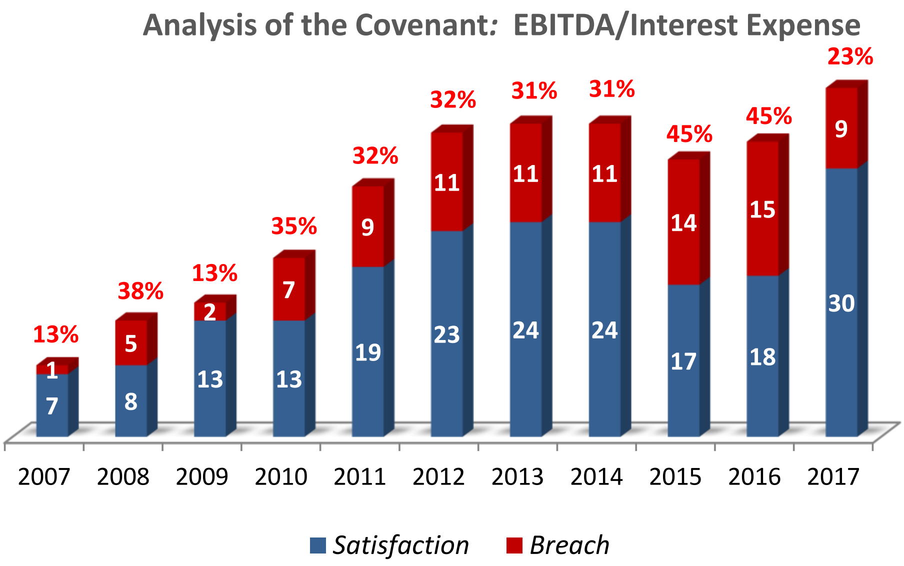


Figure 4: Breach of the covenant *EBITDA/ Interest Expense* over the years - Firms listed on the B3 that disclosed the covenant limits established – The figure presents the number of observations of covenants satisfied (in blue) and not satisfied (in red) each year. The percentages denote the ratios between the number of violated covenants and the total observations in each year. The number of observations with covenant limit disclosed is substantially lower than the number of firms that reported having covenants.

Covenant: Net Debt/EBITDA				
Sector	***Satisfaction* Obs.**	***Breach* Obs.**	***Total* Obs.**	***Breach* Freq. (%)**
Foods and Beverages	26	10	36	**6%**
Commerce	31	20	51	**11%**
Electricity	80	36	116	**21%**
Non-metallic Minerals	3	3	6	**2%**
Mining	7	1	8	**1%**
Others	139	44	183	**25%**
Pulp and Paper	9	13	22	**7%**
Oil and Gas	5	0	5	**0%**
Chemicals	12	0	12	**0%**
Steelmaking & Metallurgy	5	12	17	**7%**
Software and Data Processing	8	0	8	**0%**
Textiles	18	10	28	**6%**
Transport and Services	53	21	74	**12%**
Vehicles and Parts	2	4	6	**2%**
Total	**398**	**174**	**572**	**100%**

Table 7: Frequency of breach of the covenant *Net Debt/EBITDA* by sector – Sector classification of Economatica.

Covenant: EBITDA/Interest Expense				
Sector	***Satisfaction* Obs.**	***Breach* Obs.**	***Total* Obs.**	***Breach* Freq.**
Food and Beverages	0	1	1	**1%**
Commerce	7	7	14	**7%**
Construction	2	8	10	**8%**
Electricity	42	3	45	**3%**
Non-metallic Minerals	0	2	2	**2%**
Mining	2	7	9	**7%**
Others	98	20	118	**21%**
Pulp and Paper	3	4	7	**4%**
Oil and Gas	0	1	1	**1%**
Chemicals	8	2	10	**2%**
Steelmaking & Metallurgy	13	9	22	**9%**
Textiles	3	18	21	**19%**
Transport and Services	18	8	26	**8%**
Vehicles and Parts	0	5	5	**5%**
Total	**196**	**95**	**291**	**100%**

Table 8: Frequency of breach of the covenant *EBITDA/Interest Expense* by sector – Sector classification of Economatica.

Table 9 presents a detailed analysis of the violation of the main covenants. For the ratio *Net Debt/EBITDA* (Panel A), unlike exhibited in Table 6, where the firms that disclosed the calculated ratios were distant from the general average of the firms, in the Total column note that the average (3.37) is very near the average of the clause (3.44), which can also be seen in the columns that show the distance of the average observed value from the value established in the covenants (in absolute value and percentage). This occurs because the average of the firms that breached a covenant (6.64) is nearly twice that of the established clause (3.46). In contrast, the firms that did not breach a covenant (the majority of the sample) are distant from the clause value on average, presenting mean covenant slack of approximately -45% (i.e., in this group of firms, the observed ratio was on average 45% lower than the required level).

As can be seen in Panel B of Table 9, for the ratio *EBITDA/Interest Expense*, on average the firms are distant from breaching covenants, with an average calculated ratio of 2.99 versus an average covenant value of 1.78. For this ratio, the greater the value, the higher the firm's financial slack. Also regarding this indicator, only a small portion of the firms present covenant violation (95 of 291 observations), and the average distance from covenant breach (or covenant slack) is even greater than in the case of the *Net Debt/EBITDA* ratio for firms that did not breach a covenant, at approximately 150%.

Table 10 presents the frequency distribution of the firms that breached the two main covenants at intervals of 20%, for a total of 174 observations for the covenant *Net Debt/EBITDA* and 95 observations for the covenant *EBITDA/Interest Expense*. The table also shows the covenant slack of the firms that did not breach a covenant, i.e., the distance to breach, also in intervals of 20%.

For the covenant *Net Debt/EBITDA*, 37% of the observations exceed the established covenant by up to 20%, while in the case of the firms that did not breach the referred covenant, the largest proportion (49% of the total) presented slack of up to 40%.

For the covenant *EBITDA/Interest Expense*, 31% of the observations exceed the established covenant by more than 80%. On the other hand, 57% of the firms not breaching the referred covenant present slack greater than 80%, as was expected due to the averages of the statistics presented in Table 9.

Panel A - Analysis of the Covenant: Net Debt/EBITDA												
	Dummy Breach = 0				Dummy Breach				Total			
	Covenant Limit	*Observed Ratio*	*Difference*	*Distance*	*Covenant Limit*	*Observed Ratio*	*Difference*	*Distance*	*Covenant Limit*	*Observed Ratio*	*Difference*	*Distance*
Mean	3.43	1.94	-1.50	-45%	3.46	6.64	3.09	86%	3.44	3.37	-0.10	-5%
Median	3.50	1.94	-1.38	-41%	3.50	4.59	1.08	32%	3.50	2.49	-0.80	-24%
Standard Deviation	0.81	1.19	0.98	30%	0.81	6.45	5.91	163%	0.81	4.28	3.96	111%
Minimum	2.00	-0.70	-4.33	-135%	2.00	1.95	0.03	1%	2.00	-0.70	-4.33	-135%
Maximum	6.53	5.76	-0.02	-1%	6.53	3.27	2.73	809%	6.53	32.69	27.30	809%
Observations	398	398	398	398	174	174	174	174	572	572	572	572

Panel B - Analysis of the Covenant: EBITDA/Interest Expense												
	Dummy Breach = 0				Dummy Breach = 1				Total			
	Covenant Limit	*Observed Ratio*	*Difference*	*Distance*	*Covenant Limit*	*Observed Ratio*	*Difference*	*Distance*	*Covenant Limit*	*Observed Ratio*	*Difference*	*Distance*
Mean	1.77	4.27	2.51	150%	1.81	0.37	-1.45	-79%	1.78	2.99	1.22	75%
Median	1.75	3.81	1.75	100%	2.00	0.95	-0.92	-48%	1.75	2.47	0.79	47%
Standard Deviation	0.47	2.40	2.38	154%	0.43	1.74	1.79	89%	0.46	2.87	2.88	173%
Minimum	1.00	1.37	0.03	2%	1.00	-6.50	-8.50	-425%	1.00	-6.50	-8.50	-425%
Maximum	3.50	13.51	12.31	764%	3.00	2.66	-0.01	-1%	3.50	13.51	12.31	764%
Observations	196	196	196	196	95	95	95	95	291	291	291	291

Table 9: Analysis of the position of firms listed on the B3 with respect to the main covenants – *Covenant limit* refers to the limit established in the contract and disclosed by the firm in financial statement notes; *Observed ratio* refers to the value presented by the firm in a determined year in financial statement notes (or calculated in the case firms that did not disclose the ratio, but only the clause established in a contract); *Difference* refers to the difference between the observed (or calculated) ratio and the limit established in the covenant; and *Distance* refers to the percentage difference, i.e., difference over the established covenant limit.

	Covenant Breach: Net Debt/EBITDA					
Cov. Breach	**up to 20%**	**20% to 40%**	**40% to 60%**	**60% to 80%**	**above 80%**	**TOTAL**
Obs.	65	36	20	9	44	**174**
Freq. (%)	37%	21%	11%	5%	25%	**100%**
	Covenant Slack: Net Debt/EBITDA					
Cov. Slack	**up to 20%**	**20% to 40%**	**40% to 60%**	**60% to 80%**	**above 80%**	**TOTAL**
Obs.	94	100	91	53	60	**398**
Freq. (%)	24%	25%	23%	13%	15%	**100%**

	Covenant Breach: EBITDA/Interest Expense					
Cov. Breach	**up to 20%**	**20% to 40%**	**40% to 60%**	**60% to 80%**	**above 80%**	**TOTAL**
Obs.	19	22	12	13	29	**95**
Freq. (%)	20%	23%	13%	14%	31%	**100%**
	Covenant Slack: EBITDA/Interest Expense					
Cov. Slack	**up to 20%**	**20% to 40%**	**40% to 60%**	**60% to 80%**	**above 80%**	**TOTAL**
Obs.	24	19	20	22	111	**196**
Freq. (%)	12%	10%	10%	11%	57%	**100%**

Table 10: Analysis of the magnitude of covenant breach and covenant slack – *Covenant slack* refers to the difference between the calculated (or observed) value and the covenant limit.

Based on the results obtained, we stress the importance of more deeply analyzing the financial statement notes of the firms to find information on renegotiation of clauses restricting debt, often called granting of waivers.

The international literature indicates a high frequency of waivers. Denis and Wang (2014) found that even without having violated covenants, companies often renegotiate clauses with creditors. They stated that this renegotiation relaxes the restrictions, resulting in substantial changes in the existing limits. Evidence in this sense was also obtained by Roberts (2015), who noted that a typical debt agreement is renegotiated five times during its existence, or once every nine months, with substantial changes in the contractual characteristics (e.g., pricing, maturity, amount and covenants) with each renegotiation.

It remains to be seen to what extent Brazilian firms renegotiate their debt agreements or adjust their capital structure before nearing the limits established in covenants, thus avoiding the penalties set for violation of restrictive clauses (in particular, acceleration of the debt), a fertile theme for future investigations.

4 – Final considerations

The objective of this article was to paint a panorama of the presence of covenants in debt contracts of Brazilian companies listed on the B3, and to present the position of these firms in relation to such clauses, in the period from 2007 to 2017.

We identified 15 types of covenants by examining the notes to the financial statements related to loans and financing, bond issues and financial leasing of these firms. With respect to the characteristics of the firms, as expected, larger size, higher leverage, greater profitability and listing in enhanced governance segments of the B3 were positively associated with the existence of covenants. Among the 15 ratios found, two stood out: *Net Debt/EBITDA* and *EBITDA/Interest Expense*, which together accounted for nearly 60% of the observations of covenants.

On average, the limits established for the Brazilian firms listed on the B3 were 3.4 for *Net Debt/EBITDA* and 1.8 for *EBITDA/Interest Expense*. For the firms that presented their position with respect to both ratios, the averages were 2.4 for the first and 3.6 for the second. Therefore, on average these firms were far from exceeding the thresholds established for violating the covenants. When we calculated the indicator for all the firms that presented covenants, but not their position, the average distance from covenant breach (or covenant slack) declined substantially, to an average of 3.37, very near the average of the contractual clauses, of 3.44. The greatest breach frequencies occurred in 2015 and 2016 (years of recession), and the sectors negatively affected the most were electric power and textiles. Finally, we found that 30% of the total observations exceeded the limits set by creditors.

On the other hand, it is common for firms to renegotiate the debt contracts before violation of the restrictive clauses. Therefore, investigating the role of waivers obtained by renegotiation can bring relevant contributions regarding the impacts of covenants on the financing and investment policies of Brazilian firms.

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Appendix I – Additional descriptive statistics

	Group: Firms without Covenants Dummy Cov = 0								
	Debt_Assets	*Ln(Assets)*	*Ln(Sales)*	*Fix. Ass._Total Ass.*	*EBIT_Assets*	*ROI*	*M/B*	*Liquidity*	*Own_Conc*
Mean	0,24	7,09	6,41	0,27	0,07	0,08	1,36	2,11	70,93
Median	0,22	7,10	6,35	0,21	0,06	0,07	1,13	1,62	73,92
St. Dev.	0,17	1,79	1,88	0,24	0,10	0,14	0,76	1,70	22,78
Minimum	0,00	3,64	1,91	0,00	-0,22	-0,40	0,55	0,29	7,21
Maximum	0,70	12,06	11,35	0,87	0,36	0,48	4,51	9,05	100,00
Obs.	1129	1129	1097	1129	1129	1112	1020	1138	1095

	Group: Firms with Covenants Dummy Cov = 1								
	Debt_Assets	*Ln(Assets)*	*Ln(Sales)*	*Fix. Ass._Total Ass.*	*EBIT_Assets*	*ROI*	*M/B*	*Liquidity*	*Own_Conc*
Mean	0,34	8,46	7,72	0,27	0,07	0,07	1,36	1,69	67,85
Median	0,34	8,48	7,75	0,25	0,07	0,07	1,15	1,52	69,27
St. Dev.	0,15	1,37	1,49	0,24	0,07	0,10	0,67	0,97	23,44
Minimum	0,00	3,64	1,91	0,00	-0,22	-0,40	0,55	0,29	0,14
Maximum	0,70	12,06	11,35	0,87	0,36	0,48	4,51	9,05	100,00
Obs.	1403	1403	1395	1403	1403	1376	1276	1403	1353

	Total Sample								
	Debt_Assets	*Ln(Assets)*	*Ln(Sales)*	*Fix. Ass._Total Ass.*	*EBIT_Assets*	*ROI*	*M/B*	*Liquidity*	*Own_Conc*
Mean	0,30	7,85	7,14	0,27	0,07	0,08	1,36	1,88	69,23
Median	0,30	7,95	7,17	0,23	0,07	0,07	1,14	1,54	70,53
St. Dev.	0,16	1,71	1,80	0,24	0,09	0,12	0,71	1,36	23,19
Minimum	0,00	3,64	1,91	0,00	-0,22	-0,40	0,55	0,29	0,14
Maximum	0,70	12,06	11,35	0,87	0,36	0,48	4,51	9,05	100,00
Obs.	2532	2532	2492	2532	2532	2488	2296	2541	2448

Table A.1: Descriptive statistics – The variables are defined in Table 1.

Appendix II – Firms that disclosed covenants and ratios

Has Covenants	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Level 2 & NM	31	47	58	73	78	87	92	96	95	96	105
Other Segments	27	32	44	52	59	58	60	67	70	66	67
TOTAL	**58**	**79**	**102**	**125**	**137**	**145**	**152**	**163**	**165**	**162**	**172**
% Level 2 & NM	53%	59%	57%	58%	57%	60%	61%	59%	58%	59%	61%
Has Ratios	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Level 2 & NM	16	23	29	39	46	56	59	62	66	74	75
Other Segments	10	12	23	24	32	32	33	35	36	39	41
TOTAL	**26**	**35**	**52**	**63**	**78**	**88**	**92**	**97**	**102**	**113**	**116**
% Level 2 & NM	62%	66%	56%	62%	59%	64%	64%	64%	65%	65%	65%

Table A.2: Disclosure by trading segment of the B3