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Independence of the Board of Directors Reduces the Debt Financing Cost?

ABSTRACT

Objective: Check the influence of board of directors independence on the cost of debt financing of companies listed in B3.

Method: The cost of the debt was analyzed by calculating the ratio between the financial expenses and costly liability. For board independence, three variables were used: 1) percentage of independent members; 2) dummy who received 1 value when most board members were independent; and, 3) dummy that captured the existence of duality in the position of CEO and chairman of the board.

Originality/relevance: In the literature, the results of previous studies are still divergent. Thus, this issue still presents shortcomings which require investigation. Furthermore, the investigations occurred, mainly, in North American companies, so the matter deserves attention in countries such as the Brazil.

Results: The average cost of debt increased from 2012 to 2016. The average percentage of independent members did not exceed 25%, in less than 17% of the companies, independent members were the majority, and there was a reduction in the number of companies with duality in CEO and chairman positions. It was also found that only the percentage of independent members influenced to reduce the cost of debt. It is believed that the pressure exerted by the controlling shareholder and other internal directors may be reducing the positive impact of the independent directors.

Theoretical/methodological contributions: The research contributes to strengthen the understanding of the theme in Brazilian scenario and broadens the existing discussion in the literature by addressing a factor influencing the cost of debt financing still little explored in Brazil.

Keywords: Board of directors independence; Debt cost; Publicly traded companies; Debt to equity; Indebtedness.

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1 INTRODUCTION

Corporate governance values the principles of probity, clarity and ethics. It is a system which controls, directs the companies and has as a central mechanism the board of directors (Moura & Beuren, 2011; Vieira, Velasquez, Losekann & Ceretta, 2011). The board of directors assists in decision-making and plays an important role in the mitigation of managerial failures and effective supervision of the company operations (Chancharat, Krishnamurti & Tian, 2012).

Then, the board is one of the most important mechanisms of governance. However, for its performance to occur effectively, the independence of this body regarding the controller and the management itself is crucial. (Muniandy & Hillier, 2015). Therefore, according to Fuzi, Halim and Julizaerma (2016), a combination of internal executive directors and independent directors is required. Independent directors are less susceptible to the problems of self interest and less subject to the influence of controllers and managers. Therefore, they tend to be more effective monitors of managers and may even serve as substitutes for protecting the rights of minority shareholders and creditors in weak institutional environments (Fields, Fraser & Subrahmanyam, 2012; Bradley & Chen, 2015).

Corporate governance and, more specifically, the independence of the board of directors, are important issues. Therefore, several researchers have sought to relate them to performance (Dai, Fu, Kang & Lee, 2016; Detthamronga et al., 2017), earnings management (Luthan, Satria & Ilmainir, 2016; Riwayati, Markonah & Siladjaja, 2016).), tax planning (Armstrong, Blouin, Jagolinzer &), 2015; mulyadi & Anwar, 2015) executive compensation (Dimick & Rao, 2016; Al-Najjar, 2017), social and environmental responsibility (Liu & Zhang, 2017; Wang & Sarkis, 2017), stock value (Nadarajah, Ali, Liu & Huang, 2018; Prommin, Jumreornvong , Jiraporn & Tong, 2016), and also the financing cost of debt.

Among the international studies that investigated the influence of board independence on the cost of debt, Anderson, Mansi and Reeb (2004), Ashbaugh-Skaife, Collins and LaFond (2006), Piot and Missonier-Piera (2009), Bradley and Chen (2011), Chen (2012), Fields et al. (2012), Aman and Nguyen (2013), Tanaka (2014), Bradley and Chen (2015) and Ghouma, Ben-Nasr and Yan (2018) can be cited. It should be emphasized that the majority of these authors researched, mainly, North American companies. Therefore, this issue deserves attention in other countries, such as in the case of Brazil.

In Brazil, some studies have linked governance to the cost of debt: Caroprezo (2011) used the Carvalhal da Silva and Leal index (2005), the different levels of governance of BM&FBovespa (current B3) and the listing of ADRs in the United States of America; Barros, Silva and Voese (2015) measured governance through the Carvalhal da Silva and Leal index (2005) and differentiated levels of governance; Fonseca and Silveira (2016) related the fact that companies are listed under different levels of governance with the cost of debt.

In general, national surveys seek to investigate other governance variables, but no research has been identified that specifically analyzed the influence of the independence of the board of directors on the cost of debt. Furthermore, the results of international surveys show divergences, because, while some researchers found that there was influence of the board of directors independence on the cost of debt, as Anderson, Mansi and Reeb (2004), Ashbaugh-Skaife, Collins and LaFond (2006), Fields, Fraser and Subrahmanyam (2012), Bradley and Chen (2015) and Ghouma, Bem-Nasr and Yan (2018). Others, such as Bradley and Chen (2011), Chen (2012), Aman and Nguyen (2013) and Tanaka (2014) found that the board independence did not influence the debt cost.

So, there is a gap in the national literature on this topic, therefore, it is relevant the investigation of this issue. Thus, the research question guiding this study is: what is the

influence of the board of directors independence on the cost of debt financing of companies listed in B3? With this, the study aims to verify the influence of board of directors independence on the cost of debt financing of companies listed in B3.

Formal financing is an important source that companies, mainly from emerging countries, have to obtain resources, as in these countries the stock market tends to be underdeveloped (Shailer & Wang, 2015; Lanzarin, 2018), which indicates the importance of analyze the issues involving the cost of debt, to control and reduce the risks of capital suppliers and, thus, to increase investment capacity. Therefore, the research becomes relevant by providing new evidence from the Brazilian scenario, which still lacks research on the topic.

2 BOARD OF DIRECTORS INDEPENDENCE AND COST OF DEBT FINANCING

Good governance practices may restrict opportunistic behavior of managers and controllers, which would lower, of course, the prize required due to the risk by capital providers (Aman & Nguyen, 2013). With regard to governance practices, the central internal control mechanism to monitor managers is the board of directors, whose performance will depend on their level of independence, which is associated with greater or lesser influence from controlling shareholders (Moura & Beuren, 2011; Bradley & Chen, 2015).

The lower the influence of controlling shareholders on board members, the lower the chances of directors acting only for the benefit of the controlling shareholders. (Anderson *et al.*, 2004; Aman & Nguyen, 2013; Tanaka, 2014). Thus, companies that have a higher proportion of independent board members also tend to have better monitoring of management actions.

In this way, bondholders will face less risk in relation to the company's management, which may lead to a reduction in the cost of debt (Bhojraj & Sengupta, 2003). In this regard, Anderson *et al.* (2004), Fields *et al.* (2012), Tanaka (2014) and Ghouma *et al.* (2018) pointed out that independent directors perform better monitoring of management and, therefore, restrict self-interest activities.

Another important responsibility of the boards, according to Anderson *et al.* (2004), Chen (2012) and Bradley and Chen (2015), under the perspective of creditors, is to supervise and ensure the quality of financial statements. Given that debt lenders depend on the accounting information presented to assess the possibility of financing granting and interest that will be charged, it is natural that companies with more independent boards will give creditors greater credibility regarding their accounting information.

As Anderson *et al.* point out (2004), from the creditor's point of view, one of the most important factors that can influence the greater integrity and quality of accounting information is the board independence, so that the cost of debt can be sensitive to the independence of that body. However, the board monitoring power, as warned by Ashbaugh-Skaife *et al.* (2006) can be severely compromised if the CEO also serves as chairman of the board. This is because the chairman of the board often sets the board's agenda and therefore controls the issues that will be addressed at meetings. Then, when the same individual occupies both positions, certain subjects may be left out of the meeting agendas.

In this sense, Ashbaugh-Skaife *et al.* (2006) mention that because the chairman has significant influence in the selection of candidates for other board seats, with the duality of office, the risk increases that new board members will not be independent.

Furthermore, according to Bradley and Chen (2015) and Ghouma *et al.* (2018), the power of the chief executive officer on the board of directors is further expanded and the

board's power to discipline management is likely to be limited. Thus, it is possible that duality in the position of CEO and Chairman, which limits independence, is associated with higher debt financing costs (Anderson et al., 2004; Bradley & Chen, 2015).

In the literature, the results regarding the influence of the board's independence on the cost of corporate debt are still divergent, which can be verified in more detail in previous studies, which will be described in the next section, however, most studies showed a negative relationship. Therefore, the following research hypothesis was formulated:

H₁: There is a negative relationship between board independence and the cost of debt financing.

Therefore, companies with more independent boards of directors are expected to have lower debt financing costs, as in the studies by Anderson, Mansi and Reeb (2004), Ashbaugh-Skaife, Collins and LaFond (2006), Fields, Fraser and Subrahmanyam (2012), Bradley and Chen (2015) and Ghouma, Bem-Nasr and Yan (2018).

3 PREVIOUS STUDIES ON INDEPENDENCE OF THE BOARD OF DIRECTORS AND THE COST OF DEBT FINANCING

For the selection of articles in this subsection, international accounting journals were consulted, classified with high impact index by the Journal Citation Reports (JCR), in the 2016 edition. National journals listed in the Webqualis of the Coordination for the Improvement of Higher Education Personnel (CAPES) (Quadriennium 2013-2016) were consulted, in strata A1 to B5, in the area of Public and Business Administration, Accounting and Tourism. To identify the articles, combinations were made with the following keywords: board independence; board characteristics; cost of debt; debt financing; cost of debt financing. In national journals, the respective words in Portuguese were used.

Importantly, this section contains only studies that specifically investigated the influence of board independence on the cost of debt, or that investigated other governance characteristics, but which also complemented the influence of board independence. However, studies that addressed other governance issues, without involving the independence of the board, were not described, since they would not be directly related to the main objective of this research.

It begins with the research by Anderson et al. (2004) which investigated the association between independence of the board and cost of debt financing. The analysis occurred in a sample of 252 North American companies, which had available data in the period from 1993 to 1998. The results showed that companies with larger and more independent boards had a lower cost of debt financing, suggesting that the boards of directors were an important element in the accounting and financial process.

Ashbaugh-Skaife *et al.* (2006) investigated whether companies that had strong governance benefited from higher credit ratings and lower debt costs. The sample consisted of 894 US publicly-held companies, which had data for the year 2002. The results showed that the independence, financial knowledge and shareholding of the board members were negatively associated with the cost of debt, with the conclusion of that companies with weak governance were less likely to receive an investment grade credit rating.

Piot and Missonier-Piera (2009) investigated the effects of corporate governance on the debt financing costs of open French companies. The analysis took place from 1999 to 2001, and the results revealed a negative relationship between the cost of debt and the

independence of the board, the existence of a compensation committee composed of non-executive directors and the presence of institutional shareholders.

Bradley and Chen (2011) analyzed the influence of the board's independence on the cost of debt financing, using a sample consisting of 430 publicly traded companies listed in the Standard & Poor's (S&P) 1500 index, from 2002 to 2007, whose results showed that the independence of the board did not influence the cost of debt.

Chen (2012) examined, in 388 US public companies that had data available from 2002 to 2007, the effect of board characteristics on the cost of debt, and found that higher percentages of independent members, the majority of independent members in the board and non-duality in the position of CEO and chairman of the board were characteristics that influenced the lower cost of debt.

Fields *et al.* (2012) investigated the relationship between the quality of the board with the cost of debt in 1054 North American companies that had data from 2002 to 2005. The results showed that the cost of borrowing, including contractual restrictions, was lower in companies with larger, more independent boards of directors.

Tanaka (2014) explored the relationship between corporate governance mechanisms and the cost of debt in a sample of 196 Japanese companies in the period from 2005 to 2008. The analysis revealed that the effect of governance on cost depended on the characteristics of the systems corporate governance, that is, companies with large corporate shareholders had lower debt costs, which indicated that debt creditors considered the monitoring activities of large shareholders favorable.

Bradley and Chen (2015) investigated whether the independence of the board reduced the cost of debt, by analyzing 1,610 North American companies in the period from 2002 to 2006, and realized that independence positively influenced the cost of debt when there were situations of conflict or risk serious. However, in the event of minor conflicts, the impact on the cost of debt was negative.

Ghouma *et al.* (2018) investigated the relationship between governance and financing cost of debt in a sample of 169 Canadian companies in the period from 1986 to 2014. The results showed that Globe and Mail overall governance index presented a negative and significant coefficient, indicating that corporate governance influenced the cost of debt. The board composition and independence presented greater weight in the final index.

It appears from the articles presented, that the results are still divergent, as some authors have identified a relationship between board independence and debt cost, while others have found no relationship. Thus, this topic still has gaps that require investigation. It is also noted that the investigations occurred, mainly, in North American companies, therefore the theme deserves attention in other countries, as is the case of Brazil.

4 METHODOLOGICAL PROCEDURES

To meet the proposed objective, a descriptive, documentary and quantitative research was conducted. Due to the peculiarities of the sector, each year, companies that engaged in financial activities were excluded, as well as those that did not have information to calculate all the variables used in the research. Thus, the selected sample totaled 209 companies in 2012, 213 in 2013, 221 in 2014, 215 in 2015 and 221 in 2016.

To identify the cost of debt financing, similarly to previous studies of Caroprezo (2011), Fields *et al.* (2012), Bradley and Chen (2015), Barros *et al.* (2015) and Fonseca and Silveira (2016), it was calculated, for each year, for each company in the sample, the ratio between financial expenses and the average onerous liability of the year. The onerous liability

was represented by short and long term loans and financing, including issued debentures. The data were collected from Economatica® database and refer to the period from 2012 to 2016.

To investigate the independence of corporate boards, similar to the studies by Anderson et al. (2004), Ashbaugh-Skaife *et al.* (2006), Fields *et al.* (2012), Bradley and Chen (2015) and Ghouma *et al.* (2018), three variables were used: a) percentage of independent board members (PercIndep_BD), b) dummy that received a value of 1 when the majority (50% + 1) of the board members were independent (MajorMemberBD_Indep), and c) dummy that captured the existence of duality in the position of chairman of the board and chief executive officer (Dual_CEO&ChairmBD). Data were collected manually each year for each sample company in the Reference Forms in Section 12.6.

A descriptive analysis of the debt cost variable and the board's independence variables was performed. Afterwards, multiple linear regressions was used to analyze the influence of board independence on the cost of debt. Normality assumptions were observed using the Kolmogorov-Smirnov test; multicollinearity, through the variance inflation factor - VIF and Tolerance, and absence of serial autocorrelation by the Durbin-Watson test. To examine the existence of homoscedasticity in waste behavior, the Pesarán-Pesarán test was applied.

In the regressions, the variable cost of debt was classified as dependent (predicted). The variables that capture the independence of the board, as well as of control, were classified as independent (predictive). The control variables used were:

a) Size_Board (total number of members): Larger boards can increase the level of management monitoring and improve the financial process, thereby contributing to debt cost reduction (Anderson et al., 2004; Fields et al., 2012; Aman & Nguyen, 2013).

b) Age_Company (years that have elapsed since the date of its founding in the CVM register): companies that have been in the market for a longer period have greater financial solidity and better management mechanisms that help to achieve competitiveness. In addition, they usually establish good relationships with various stakeholders, including debt lenders. So, older companies tend to have lower costs of debt (Chen, 2012; Fields *et al.*, 2012; Tanaka, 2014; Bradley & Chen, 2015).

c) Governance (dummy that received a value of 1 when the company was listed at some differentiated B3 governance level): good governance practices help to reduce agency problems, information asymmetry and help to protect the interests of shareholders and of debt lenders. Therefore, companies that have better corporate governance practices tend to have lower costs of financing debt (Chen, 2012; Fields *et al.*, 2012; Aman & Nguyen, 2013).

d) Indebtedness ((Current Liabilities + Non-Current Liabilities)/Total Assets): Companies with higher levels of indebtedness increase the prospect of bankruptcy and therefore tend to pay higher interest because they are seen as riskier (Anderson et al., 2004; Tanaka, 2014; Bradley & Chen, 2015; Ghouma et al., 2018).

e) Size_Company (log of total assets): Larger companies tend to benefit through economies of scale and stable performance. They also have greater capacity to withstand difficulties arising from negative cash flow and, therefore, are less prone to default. Thus, they are viewed as less risky by lenders and tend to have lower debt costs (Fields et al., 2012; Tanaka, 2014; Ghouma et al., 2018).

f) ROA (Ebitda / Total Assets): More profitable companies will have less difficulty in paying debt and, therefore, tend to have lower cost of debt (Tanaka, 2014; Bradley & Chen, 2015; Ghouma et al., 2018).

g) Growth (percentage growth of assets): Companies that are constantly growing are subject to greater risk and therefore tend to have a higher cost of debt (Tanaka, 2014; Bradley & Chen, 2015).

The data of the variable “Size_Board” were collected manually in the Reference Forms: Section 12.5/6, the data of the variable “Age_Company” also was collected manually in Reference Forms Cadastral data - General data. The data for the variables “indebtedness”, “Size_Company”, “ROA” and “Growth” variables were collected in the Economática® database. The data on “Governance” were collected manually on the B3 website.

5 DESCRIPTION AND DATA ANALYSIS

This section contains description and data analysis. Table 1 presents the descriptive statistics of debt financing cost.

Table 1
Descriptive statistics of debt financing cost for the period from 2012 to 2016

B3 Economic sector	2012 Mean	2013 Mean	2014 Mean	2015 Mean	2016 Mean	2012 to 2016 Mean
Industrial goods	0.36	0.43	0.40	0.55	0.79	0.51
Cyclical consumption	0.33	0.36	0.50	0.45	0.63	0.45
Non-cyclical consumption	0.38	0.52	0.47	1.19	0.47	0.60
Basic Materials	0.27	0.32	0.31	0.61	0.34	0.37
Petroleum, Gas and biofuels.	0.55	0.52	0.67	1.26	0.98	0.82
Health	0.44	0.63	0.32	0.73	0.78	0.59
Information technology	0.22	0.18	0.23	0.50	0.70	0.37
Telecommunications	0.21	0.22	0.29	0.38	0.35	0.30
Public Utilities	0.29	0.27	0.35	0.47	0.42	0.36
Mean	0.33	0.37	0.41	0.59	0.59	0.46

As can also be observed, the economic sector of petroleum, gas and biofuels stood out negatively, as companies in this sector had the highest average debt cost indicator of the period, equivalent to 0.82. In this sector, in the year 2012, the first year of analysis, the average indicator corresponded to 0.55, which increased to 0.98 in the year 2016, the last year of the analysis. It is important to emphasize that this increase was 78% in the period, with higher elevation from the year 2014. Also noteworthy were the companies in the non-cyclical consumer sector and the health sector with higher indicators, with average indicators of 0.60 and 0.59, respectively.

Table 1 also shows that Telecommunications sector had companies with the lowest debt cost indicators, given that the average indicator for the period was 0.30. In 2012, in this sector, the average indicator corresponded to 0.21, rising to 0.30 in 2016, ie, an increase of 43%. Companies in the basic materials, information technology and public utilities sectors also stood out with lower average indicators in the period.

Table 2 presents the descriptive statistics of the percentage of independent board members.

Table 2 shows the average percentage of each year that the majority of board members were not independent, since in the period from 2012 to 2016, the average percentage did not exceed 22%. In 2012, the average percentage corresponded to only 20%, and 100% of independent members were not identified in any of the companies. It can also be seen that the average percentage increased to 21% in 2013, to 22% in 2014 and 2015 and to 24% in 2016.

Table 2

Descriptive statistics of the percentage of independent members on the board of directors from 2012 to 2016

B3 Economic sector	2012 Mean	2013 Mean	2014 Mean	2015 Mean	2016 Mean	2012 to 2016 Mean
Industrial goods	21%	23%	23%	24%	22%	23%
Cyclical consumption	25%	26%	30%	30%	31%	28%
Non-cyclical consumption	22%	26%	27%	23%	24%	24%
Basic Materials	14%	16%	14%	17%	17%	16%
Petroleum, Gas and biofuels	26%	32%	28%	25%	28%	28%
Health	20%	21%	19%	21%	25%	21%
Information technology	37%	21%	35%	36%	28%	32%
Telecommunications	6%	6%	8%	8%	4%	6%
Public Utilities	12%	13%	13%	14%	19%	14%
Mean	20%	21%	22%	22%	24%	22%

It is also noticed that companies in the economic sector of information technology have more independent boards, compared to companies in other sectors, as the average percentage corresponds to 32%. In this sector, in 2012, the first year of the analysis, the average percentage of independence was 37%, which fluctuated in the period and decreased to 28% in 2016, the last year of the analysis. Also noteworthy were companies in the cyclical consumption sector and in the oil, gas and biofuels sector, both with an average percentage of 28%.

On the contrary, negatively, with less independent boards, companies in the telecommunications sector stood out, in which the average percentage of independence in the period was only 6%, and the percentage of 6% in 2012 decreased to 4% in 2016. Companies in the sectors of public utility and basic materials, too, had less independent boards in the period under investigation, with average indicators of 14% and 16%, respectively.

Table 3 shows the percentages of sample companies where independent members were the majority on the boards.

Table 3

Descriptive statistics of the percentage of companies in which independent members were the majority on the board of directors from 2012 to 2016

B3 Economic sector	2012 Mean	2013 Mean	2014 Mean	2015 Mean	2016 Mean	2012 to 2016 Mean
Industrial goods	13%	15%	17%	23%	11%	16%
Cyclical consumption	20%	22%	20%	24%	25%	22%
Non-cyclical consumption	6%	27%	19%	13%	21%	17%
Basic Materials	0%	0%	0%	8%	8%	3%
Petroleum, Gas and biofuels	20%	38%	25%	25%	25%	27%
Health	0%	0%	10%	10%	18%	8%
Information technology	50%	20%	29%	29%	17%	29%
Telecommunications	0%	0%	0%	0%	0%	0%
Public Utilities	4%	4%	4%	10%	7%	6%
Mean	11%	14%	13%	17%	15%	14%

Table 3 shows that the percentage of companies in which independent members were the majority on the board of directors did not exceed 17% of the total sample. In 2012, only 11% of the companies had a board made up of the majority of independent members, which rose to 14% in 2013, with a reduction to 13% in 2014, an increase to 17% in 2015 and a further reduction to 15% in 2016.

It is also observed that the economic sector of information technology again stood out positively, presenting a higher average percentage of companies in which independent members were the majority on the boards (29%). However, it is noteworthy that the percentage of companies decreased considerably over the period. The sector of petroleum, natural gas and biofuels and the sector of cyclical consumption also stood out positively.

Negatively, the telecommunications sector stood out, where, in none of the companies, independent members were the majority. It was also found that the sectors of basic materials and utilities also had a low average percentage of companies in the period, with only 3% and 6%, respectively. In the basic materials sector, in the years 2012, 2013 and 2014, in none of the companies, independent members were the majority on the board, but in 2015 and 2016, 8% of the companies already had the majority of independent members on the boards.

Table 4 shows the percentages of companies in which the chief executive officer (CEO) was also the chairman of the board of directors.

Table 4
Percentage of sample companies where CEO was also Chairman of the Board of Directors from 2012 to 2016

B3 Economic sector	2012 Mean	2013 Mean	2014 Mean	2015 Mean	2016 Mean	2012 to 2016 Mean
Industrial goods	13%	10%	14%	15%	18%	14%
Cyclical consumption	30%	18%	16%	15%	16%	19%
Non-cyclical consumption	25%	20%	13%	7%	7%	14%
Basic Materials	18%	13%	12%	8%	8%	12%
Petroleum, Gas and biofuels	0%	13%	13%	0%	0%	5%
Health	10%	0%	10%	0%	0%	4%
Information technology	0%	0%	14%	29%	33%	16%
Telecommunications	25%	25%	25%	0%	20%	19%
Public Utilities	11%	10%	8%	8%	7%	9%
Mean	18%	13%	13%	11%	12%	14%

Table 4 shows that the percentage of companies in which there was duality in the position of chairman and chief executive officer decreased in the period from 2012 to 2015. The health sector and the economic sector of oil, gas and biofuels stood out positively, since only in two years out of the five analyzed, for each one, companies were identified in which the CEO was also the chairman of the board, that is, in the first sector, in the years 2012 and 2014, and, in the another sector, only in the years 2013 and 2014.

When considering the average percentage of the period, the health sector had a percentage of only 4%, while the oil, gas and biofuels sector had an average percentage of 5%. In the years 2015 and 2016, in both sectors, none of the companies had dual positions. The public utility sector also stood out positively, as the average percentage corresponds to 9%, with a gradual reduction in the percentages from 2012 to 2016.

It can also be seen in Table 4 that the economic sectors of cyclical consumption and telecommunications stood out negatively. In these two sectors, on average, in 19% of companies the CEO was also the chairman of the board. However, there was a reduction in the percentage over the period, in both sectors. In the consumer discretionary sector, the percentage of 30% in 2012, fell to 16% in 2016. In the telecommunications sector, the percentage fell from 25% to 20% over the same period. Note that the information technology sector also had a higher average percentage in the period, equivalent to 16%.

Table 5 presents the regression coefficients that allow us to verify the influence of board independence on the cost of debt.

Table 5
Coefficients of the regression of board independence influence on the cost of debt in the period 2012-2016

Independent variables	Dependent variable: Cost_Div			
	Model 1	Model 2	Model 3	Model 4
(Constant)	1.30***	1.28***	1.28***	1.30***
PercIndep_BD	-0.01**			-0.01**
MajorMembrBD_Indep		-0.02		-0,11
Dual_CEO&ChairmBD			0.04	0.03
Size_Board	-0.02**	-0.02**	-0.02**	-0.02**
Age_Company	0.00	0.01	0.00	0.00
Governance	-0.13***	-0.10***	-0.09***	-0.15***
Indebtedness	0.05	0.05	0.04	0.04
Size_Company	-0.12***	-0.12***	-0.12***	-0.12***
ROA	-0.01**	-0.01**	-0.01**	-0.01**
Growth	0.01*	0.01*	0.01*	0.01*
Adjusted R-square	0.14	0.13	0.13	0.14
F-Anova	5.27***	5.05***	4.55***	8.63***
VIF/Tolerance	<5	<5	<5	<5
Durbin Watson	1.94	1.93	1.92	1.92

Note: *** significant at 1%; ** significant at 5%; * Significant to 10%

Table 5 shows that the adjusted R² were 13% and 14%, similar to those registered in other studies, such as those by Bradley and Chen (2011), which presented regressions with an R² of 11%, 13% and 15%, Aman and Nguyen (2013), who had R² of 12% and 13%, and Bradley and Chen (2015), with R² between 10% and 13%. Thus, the percentage explained by the independent variables can be considered acceptable.

The F-ANOVA tests were significant (0.01), which indicates that the models explain the dependent variable. The Durbin-Watson statistics (between 1.92 and 1.94) show that there are no problems of autocorrelation of the residuals, since the values were close to 2. The variance inflation factors (VIF and Tolerance) show that there are no there is a problem of multicollinearity between the independent variables.

Table 5 also shows that the variable "PercIndep_BD", which captures the percentage of independent members in relation to the total number of board members, as well as the "MajorMembrBD_Indep" variable, which check if the majority of the board members were independent, showed negative coefficients, either when analyzed individually, in models 1 and 2, or, in Model 4, when analyzed together. However, the coefficients are statistically significant only for PercIndep_BD variable. Due to the lack of significance of the MajorMembrBD_Indep variable, the negative coefficients give only evidence of influence of this variable for a lower debt cost.

It is also possible to verify that the variable "Dual_CEO & ChairmBD", which captures whether the positions of CEO and Chairman of the Board are held by the same individual, presented positive coefficients, either when analyzed individually, in Model 3, or, when analyzed together with the other variables. However, the coefficients are not statistically significant. It is therefore not possible to affirm that the duality influences for a higher cost of debt.

Among the control variables, five presented statistically significant coefficients. These are the variables "Size_Board", "Governance", "Size_Company", "ROA" and "Growth", being that only the variable "Growth" showed a positive coefficient. Otherwise, the variables "Age_Company" and "Indebtedness" did not show statistically significant coefficients.

6 DISCUSSION OF RESULTS

In relation to the cost of debt financing, whose average indicator was 0.46 in the period, compared to that of Caroprezio (2011), who investigated the cost of debt of 658 publicly traded companies from 2003 to 2009 and found an average indicator of 0.38, with that Barros' et al. (2015) who analyzed 83 companies in the period from 2008 to 2010 and identified an average indicator of 0.26 and with those Fonseca and Silveira's (2016) that investigated 230 publicly traded companies in the period from 2010 to 2014 and found an average indicator of 0.20, it can be seen that companies in the current sample showed a higher average indicator, indicating a higher cost of debt.

The differences may be related to the sample formation criteria. However, the increase in indicators, too, may reflect the financial crisis that occurred from 2010, as, as the Brazilian Association of Banks (ABBC, 2016) points out, from that year on, the country has been going through great periods financial crisis and, even, there was a devaluation of the dollar and an increase in the level of indebtedness of publicly-held companies.

According to the ABBC report (2016, p. 2), "The Gross Debt / PL ratio more than doubles between 2010 and 2015, rising from 0.56 to 1.23". ABBC (2016) also informs that financial institutions, in general, concerned with the recessive scenario, subject to risks, started to adopt more restrictive criteria when releasing new loans to legal entities, to monitor current portfolios and demanding higher interest rates. This may be a justification for the increase in the cost of debt identified in this research.

Specifically in the case of the economic oil, gas and biofuels sector, which stood out negatively with the highest average debt cost indicators, especially from 2014, the period in question coincides with the start of the "Lava Jato" operation, conducted by the Federal Police of Brazil, which investigates crimes of corruption, involving administrative members of Petrobras, which is one of the most representative companies in the sector, a fact that may have influenced the increase in the cost of debt.

In the case of the non-cyclical consumer sector, which presented the second largest average indicator, including 1.19% in 2015, it should be noted that the increase may have been mainly influenced by the food and beverage subsector companies, which, according to Intelligence in Stock Shares (SABE, 2016), in the period from 2014 to 2015, showed an increase of 49% in net indebtedness.

As for the percentages of independent board members, it was found that they are lower than those identified in previous surveys in other countries, such as those by Anderson et al. (2004), who investigated American companies and found an average percentage of 57%, by Ashbaugh-Skaife et al. (2006), who analyzed 894 North American publicly-held companies in 2002 and found an average percentage of 70%, by Bradley and Chen (2011), who analyzed 430 North American companies in the period from 2002 to 2007 and found a percentage average of 68%, by Chen (2012), who verified 388 North American companies in the period from 2002 to 2007 and found an average percentage of 73%, by Fields et al. (2012), who investigated 1,054 American companies in the period from 2002 to 2005 and identified an average percentage of 72.62%, and Bradley and Chen (2015), who investigated 1,610

American companies from 2002 to 2006 and found an average percentage of independence of approximately 70%.

In general, the average percentage of independence, in this study, showed a low capacity of the boards to monitor the managers, since independence in relation to the controller and the own management seems to be impaired in most companies.

Regarding the totals of companies in which most directors are independent, again the average percentages are lower than those identified in previous surveys, such as that Rajpal's (2012) where 50% of the Indian companies in the sample had the board constituted by a majority of independent members, similarly to Chen (2012) and Bradley and Chen (2015) where more than 50% of US companies had boards consisting of the majority of independent members. Such differences in results may be due to the governance characteristics of countries.

In general, the percentages of companies in which the independent members were the majority and the percentages of independent members in the board showed a large number of companies susceptible to a low capacity to monitor the boards.

For the totals of companies in which there was duality in the position of chairman of the board of directors and chief executive officer, the percentages are higher than those found by Benkel et al. (2006), who found that only 6% of Australian companies investigated had duality of functions and Rajpal (2012) who identified, in his sample of Indian companies, only 7%. However, they are lower than the percentage of 24% found by Peasnell *et al.* (2005) in a sample of companies in the United Kingdom, and the percentages of 20% and 52% found by Epps and Ismail (2009) and Chen (2012), respectively, in samples of American companies.

No separation of functions, according to Bradley and Chen (2015) and Ghouma *et al.* (2018), results in power concentration, reduces the board independence and may contribute to the increase of debt financing cost. Then, in general, the results indicate an improvement in relation to this characteristic in the investigated period.

Finally, in the multivariate analysis, it was found that "PercIndep_BD" variable, which captures the percentage of independent members in relation to the total number of board members, was statistically significant. This result is in consonance with those of Anderson *et al.* (2004), Ashbaugh-Skaife *et al.* (2006), Fields *et al.* (2012), Bradley and Chen (2015) and Ghouma *et al.* (2018) and in line with the arguments that more independent boards provide superior oversight of the financial process and, therefore, debt lenders benefit directly from greater transparency and credibility of accounting reports, resulting in lower debt costs.

However, due to the lack of significance of the "MajorMembrBD_Indep" variable, which indicated whether the majority of board members were independent and the "Dual_CEO & ChairmBD" variable, which captured the existence of duality in the position of chairman and CEO, hypothesis H1 that there is a negative relationship between the independence of the board of directors and the cost of debt financing was rejected.

In this sense, it is possible that pressure exerted by the controlling shareholder and other internal directors may be reducing the positive impact of these two characteristics of the independent directors, ie, limiting the monitoring function. Another justification, in line with Bradley and Chen (2011) and Tanaka (2014), is that the independent directors may be hampered by the difficulty of access to information. Consequently lenders, aware of such a scenario and the risks involved, do not reduce the cost of debt.

Among the control variables, five presented statistically significant coefficients. These are the variables "Size_Board", "Governance", "Size_Company", "ROA" and "Growth", and only the variable "Growth" presented a positive coefficient. Regarding the size of the board of directors, it was confirmed that larger boards can increase the level of management monitoring and improve the financial process, thus contributing to debt cost reduction, as

pointed out by authors such as Anderson et al. (2004), Fields *et al.* (2012) and Aman and Nguyen (2013).

Regarding corporate governance, the results confirm that good practices can help to reduce agency problems, information asymmetry and help protect the interests of shareholders and debt lenders. Therefore, companies that have better corporate governance practices tend to have lower costs of debt, as described Chen (2012), Fields *et al.* (2012) and Aman and Nguyen (2013).

As for the size of the company, it was confirmed that because they are more able to withstand negative cash flow difficulties and are less prone to default, they are seen as less risky by lenders and tend to have lower debt costs, as suggested by Fields et al (2012), Tanaka (2014) and Ghouma *et al* (2018).

With regard to ROA, the results also confirmed that more profitable companies will have less difficulty paying off debt. Therefore, they tend to have a lower cost of debt, as reported by authors such as Aman and Nguyen (2013), Bradley and Chen (2015) and Ghouma *et al* (2018).

In the case of growth, it was also confirmed that companies that are in constant growth may be subject to greater risk and therefore tend to have a higher cost of debt, according to Tanaka (2014) and Bradley and Chen (2015).

7 FINAL CONSIDERATIONS

The objective of the study was to verify the influence of the board's independence on the debt financing cost of publicly-held companies listed on B3. In this sense, the results showed that the variable that captures the existence of duality in the positions of CEO and chairman of the board, as well as the variable that identifies whether the majority of the members were independent, did not prove to be statistically significant. It is noteworthy that Brazil still has a developing stock market, in which the majority of companies have highly concentrated ownership, and even many have deficient governance systems, contrary to what occurs in more developed markets, as the United States.

Therefore, the pressure exerted by the controlling shareholder and the other internal directors can reduce the positive impact of the independent directors, that is, it can limit the monitoring function. Another justification for the lack of significance is based on the arguments of Bradley and Chen (2011) and Tanaka (2014) that independent directors may be harmed by the difficulty of accessing information, which would cause creditors to increase the cost of debt, for being aware of the risks involved. This may be a justification for the lack of significance of these two variables.

However, the variable that captures the proportion of independent members on the board was statistically significant, in line with the results of Anderson et al. (2004), Ashbaugh-Skaife et al. (2006), Fields et al. (2012), Bradley and Chen (2015) and Ghouma et al. (2018). These authors argue that the greater the participation of independent members on the board, the greater will be the monitoring and follow-up of management and, therefore, there would be a restriction of self-interest activities. In addition, independent directors can more effectively oversee the accounting process and prevent fraud in the financial statements. Thus, debt creditors tend to value companies that have higher percentages of independent board members when determining financing conditions. In view of the results presented, it is concluded that the percentage of independent members on the board influences the reduction of the cost of debt.

The research contributes to strengthen the understanding of the theme in the Brazilian scenario and expands the existing discussion in the literature by addressing a factor that influences the cost of debt financing (board independence), still little explored in Brazil. It also increases the literature in the area with empirical evidence related to the Brazilian scenario, which still lacks research of this nature. For this reason, the theme deserves to be highlighted, due to the importance and growing discussion in the academic environment, as well as the need to strengthen the understanding of the analyzes and conclusions.

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Independência do Conselho de Administração Reduz o Custo de Financiamento da Dívida?

Objetivo: Verificar a influência da independência do conselho de administração no custo de financiamento da dívida de companhias abertas listadas na B3.


Método: O custo da dívida foi analisado pela razão entre as despesas financeiras e o passivo oneroso. Para independência do conselho, foram utilizadas três variáveis: 1) percentual de membros independentes; 2) dummy que recebeu valor 1 quando a maioria dos membros do conselho era independente; e 3) dummy que captou a existência de dualidade no cargo de CEO e de presidente do conselho.

Originalidade/relevância: Na literatura, os resultados de estudos anteriores ainda são divergentes. Assim, esse assunto ainda apresenta lacunas que requerem investigações. Além disso, as investigações ocorreram, principalmente, em empresas norte-americanas, logo o assunto merece atenção em países como o Brasil.


Resultados: O custo médio da dívida elevou-se de 2012 para 2016. O percentual médio de membros independentes não ultrapassou 25%, em menos de 17% das empresas, os membros independentes eram a maioria, e houve redução do número de empresas com dualidade nos cargos de CEO e de presidente do conselho. Constatou-se, também, que somente o percentual de membros independentes influenciava na redução do custo da dívida. Acredita-se que a pressão exercida pelo acionista controlador e por outros conselheiros internos pode estar reduzindo o impacto positivo dos conselheiros independentes.

Contribuições teóricas/metodológicas: A pesquisa contribui para fortalecer o entendimento da temática no cenário brasileiro e amplia a discussão existente na literatura ao abordar um fator influenciador do custo da dívida ainda pouco explorado no Brasil.

Palavras-chave: Independência do Conselho de Administração; Custo da Dívida; Capital de Terceiros; Endividamento.

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