

# Determinants of Board Size: A Longitudinal Analysis with 194 Firms Listed on the B3 S/A

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## Abstract

The research aims to analyze determinants of board size (BD) of companies listed on B3 S/A, from 2014 to 2019, with data collected by the Com.dinheiro.com platform. The hypotheses “firm size is positively related to board size” (H1); “firm ownership structure is negatively related to board size” (H2); and, “firm performance is positively related to board size” (H3), were quantitatively analyzed by multiple linear regression, heteroscedasticity and multicollinearity tests and F-statistics, based on the variables: company size (TAMA); ownership structure; type of control; performance (EBITDA), and control variable, gender of the board of directors and the year. The results indicate that board size was explained by company size, ownership structure, and performance, confirming the three proposed hypotheses. For future research we suggest the use of other dependent variables that portray the board structure.

**Keywords:** performance, governance, agency conflict

## 1. Introduction

The board of directors is considered one of the most important dimensions of Corporate Governance (CG) for two specific functions: they advise managers on the company's business (Fama & Jensen, 1983); and, they monitor managers' performance (Fama, 1980). The implementation of the Board of Directors (BoD), therefore, contributes to the business dynamics, with increased efficiency and risk management, contributing to the market and investors' perception of the company (Sousa, 2014), while accounting for organizational effectiveness (Daily, Dalton, & Cannella, 2003) and sustainable value generation (Huse, 2005).

For Campbell et al. (2011), the AC acts as a monitoring agent in corporate events in function of the interests of managers, with a long-term perspective, and shareholders, who favor the long term. Thus, ACs must align business strategy with the interests of shareholders (Brenes et al., 2011).

The full operation of the BD is linked to good CG practices, such as the composition of the board, integrating independent directors, as well as varied training and experience of members (Parente & Machado Filho, 2020); as opposed to the duality of the CEO, which is a practice less and less common in Brazilian companies, and the power of the CEO, when he occupies the position of chairman of the board (Brandão et al., 2017).

About CAs one can consider endogenous variables, size and structure (Adams & Ferreira, 2003), firms' characteristics, such as: firm age (Sánchez, Bravo, & Alvarado, 2019), the level of financial leverage and ownership structure, and context and type (Matolcsy et al., 2009; ALI, 2018; Zattoni et al., 2017) as determinants for functioning CAs. Changes related to CAs involve the structural stage of firms (life cycle) such as from IPO (Sánchez, Bravo, & Alvarado, 2018). For Andreas et al. (2012) there are four types of determinants: firm characteristics, corporate performance, ownership structure, and board characteristics. The structure of CAs varies between firms and is potentially influenced by a number of variables in the firm itself (Boone et al., 2007;

Larcker et al., 2007; Linck et al., 2008; Ali, 2018; Uhlener et al., 2007).

Research on the topic emphasizes the identification of variables explaining the size of ACs within Brazil (Holtz et al., 2013), as well as accounting determinants related to board size in Jordan (Al-Naif, 2014). Considering developing countries, studies on size and structure of ACs advance in explaining the structure of SMEs' ACs upon IPO (Sánchez, Bravo, & Alvarado, 2018). However, there are suggestions for research to advance in explaining the formation of listed firms' boards through their accounting determinants, as suggested by Holtz et al. (2013) and Al-Naif (2014).

Thus, the research aims to analyze determinants of the size of the BoD of companies listed on B3 S/A; and, specifically, to identify the characteristics of the BoD and the relationship of the size of the BoDs with their accounting determinants.

It appears in the managerial context, an opportunity for strategic decisions that minimize possible agency conflicts, aligned with changes in the structure and characteristics of the boards of directors to model better corporate governance practices in the perspective of the global financial scenario (capital markets), since they establish good quality as parameters for future investments.

## **2. Corporate Governance: History, Concept, Principles and Mechanisms**

Corporate Governance (CG) emerges as a conception within the agency conflict, arising from the separation of power between the executive management of publicly traded companies and the shareholders. The book 'The Wealth of Nations' by Adam Smith in 1776, published more than two centuries ago, portrays attention to the performance of managers in the search for maximizing the results of companies, suggesting that they could be more vigilant when managing their own resources, compared to the values of third parties (Sant'ana et al., 2016). With this foundation, we have the basis for CG (Alvares, Giacometti, & Gusso, 2008).

With Berle and Means (1932) in *The Modern Corporation and Private Property*, the discussion on KM gains greater emphasis, although it is a work still little explored (Tricker, 2000; Silveira, 2010). The study by Jensen and Meckling (1976), in turn, is more recognized within the scope of CG, which configures the theoretical contributions as more recent (Ocasio & Joseph, 2005), including due to events since the 1970s in what required studies favorable to competitive gains (Becht, Bolton, & Roell, 2002; Rossoni & Machado-da-Silva, 2010; Silveira, 2010; Parente & Machado, 2020), such as growth and greater activism of institutional investors; hostile takeover wave in the United States of America (USA) in the 1980s; privatizations in European and developing countries; deregulation and global integration of capital markets; crises in emerging markets at the end of the 20th century; series of corporate scandals in the USA and Europe; and, finally, the 2008 global financial crisis.

Due to the relevance of CG, several definitions related to good CG practices have emerged worldwide, such as: Cadbury Report (1992), Principles of Corporate Governance of the Organization for Economic Cooperation and Development (OECD) (1999), Code of Best CG Practices of the Brazilian Institute of Corporate Governance (IBGC) (1999), among others.

It is considered, therefore, that CG arises from the perspective of the agency conflict, resulting from the separation of power between the executive management of publicly traded companies and shareholders, and is now seen as a set of internal and external incentive and control mechanisms, aimed at minimizing the costs arising from this conflict (Jensen & Meckling, 1976). It is also defined as a set of practices (control, monitoring and incentive mechanisms) that aim to benefit the parties with legal rights over the company, minimizing possible managerial opportunism (Berthelot, Morris, & Morrill, 2010; Lee & Lin, 2010).

From the agency theory perspective, the goal of CG is to create efficient means, with monitoring and incentive systems, to ensure the alignment of managers' actions with that of shareholders (Berthelot, Morris, & Morrill, 2010). Thus, benefits can be acquired by the possession of asymmetric information, for agents, who seek to maximize their own welfare, expropriating the wealth of company owners (Jensen & Meckling, 1976).

Silveira (2010, p. 3) also defines CG as a "set of mechanisms (internal or external, incentive or control) that aims to ensure that decisions are made to maximize the long-term value of the business and the return for all shareholders". Thus, CG contributes to the direction and influence of the actions of decision makers (Brickley & Zimmerman, 2010), through internal and external mechanisms (Silveira, Barros, & Famá 2003) and guiding principles: transparency, accountability, fairness, and corporate responsibility (IBGC, 2015; OECD, 2004; Steinberg, 2003; Malacrida & Yamamoto, 2006; Terra & Lima, 2006).

The principles and practices of CG apply to organizations, regardless of size, legal nature or control category. About the principles, one can consider some definitions, according to Table 1.

Table 1. Corporate Governance (CG) guiding principles

CG Principles	Definition
Transparency (disclosure)	It consists of the desire to make available to interested parties the information that is of interest to them, and not only that imposed by the provisions of laws or regulations. It should not be restricted to economic-financial performance, but should also include the other factors (including intangible ones) that guide managerial action and lead to the preservation and optimization of the organization's value.
Fairness	It is characterized by fair and isonomic treatment of all partners and other stakeholders, considering their rights, duties, needs, interests, and expectations.
Accountability	To render accounts of their actions in a clear, concise, understandable, and timely manner, fully assuming the consequences of their acts and omissions, and acting with diligence and responsibility within the scope of their roles.
Corporate Responsibility (compliance)	Ensure the economic and financial viability of organizations, reduce the negative externalities of their business and operations and increase the positive ones, considering, in their business model, the various capitals (financial, manufactured, intellectual, human, social, environmental, reputational, etc.) in the short, medium and long term.

Source: IBGC (2015, pp. 20-21).

The principles, as per Table 1, direct organizations to equity considering the non-discrimination of minority shareholders; greater transparency, to make information available to society; accountability, reflecting greater accountability by decision makers; and compliance, before the fulfillment of laws, rules, regulations and other requirements (Assaf, 2012). The fundamental principles that govern CG, therefore, when aligned with the strategies and culture of organizations, tend to contribute to minimize agency conflicts, as well as favor sustainable management (OECD, 2004).

For Assaf (2012), furthermore, the principles reflect in effectiveness value (effectiveness), due to the adoption of management models and instruments in favor of business continuity; ability to generate profits and create wealth. Thus, CG should emphasize the creation of shareholder value, regarding the relationship with stakeholders.

Shleifer and Vishny (1997) define CG as a set of mechanisms that regulate the relationships of the decision makers in the company to ensure the return on the investment undertaken. Leal, Silva, and Ferreira (2002) and Correia and Amaral (2006), in turn, reinforce that it is a system that encompasses a set of practices and formal monitoring processes of the management body, to preserve the interests of shareholders and mitigate conflicts of interest among stakeholders.

The primary concern of governance, then, lies in the mechanisms that encourage agents to prioritize organizational interests, ensuring return on investments (Child & Rodrigues, 2003). These mechanisms aim to reduce the effects of informational asymmetry among stakeholders, which can also generate conflicts of agency (Mazzioni et al., 2015). Costs arising from conflicts of interest can be minimized by ex-ante control, with the alignment of these interests, reducing ex-post costs and favoring the consolidation of the CG process (Rogers & Ribeiro, 2006). Thus, KM represents internal and external monitoring mechanism with impact on the agents decisions (Donker & Saif, 2008), because it enables the management of decision processes in benefit of one or more stakeholders (Morck, 2007).

CG mechanisms add up to a set of standards that aim to align stakeholders' interests, internally developed and defined by the ownership and control structure, capital structure, AC, executive compensation system, shared monitoring and multidivisional business structure (Ferreira, 2012, Rogers & Ribeiro, 2006); and, externally, represented by the legal and regulatory environment, required accounting standards, control by the capital market, competitive market pressures, institutional investors' activism and shareholders' activism (Ferreira, 2012, Rogers & Ribeiro, 2006). According to Smith and Bushman (2005) these mechanisms aim to: (i) motivate managers to make decisions that maximize the value of the firm; (ii) ensure that minority shareholders receive reliable information about the value of the firm; (iii) that managers and majority shareholders of the company do not misappropriate the resources provided by the investments.

CG mechanisms, therefore, should reduce the gap between the interests of shareholders and managers, in addition to having a significant and positive impact on the performance and value of companies (Denis & Kruse, 2001). Thus, CG structures arise from the need to regulate the relationship between agents and owners, to ensure the interests of stakeholders are met (Jensen & Meckling, 1976, Scott, 2009).

### 2.1 Board of Directors

The board of directors (BoD) represents one of the governance mechanisms (Bennett & Robson, 2004; Uhlaner et al., 2007; Jonsson, 2013). In general, the role of boards involves a mix of monitoring and advisory tasks, essential functions from the perspective of agency theory and resource dependency theory (Hillman & Dalziel,

2003; Pugliese et al., 2009).

From the agency perspective, boards focus on function oversight and accountability (Fama & Jensen, 1983), behaving as a CG mechanism capable of mitigating agency conflict (Jensen & Meckling, 1976). On the other hand, resource dependency theory argues that the main tasks of boards are strategy formulation and organizational guidance, as they are in a position to contribute to strategic decisions (Pfeffer & Salancik, 1978). The balance between these two roles varies continuously throughout the life cycle of the firm (Filatotchev et al., 2006; Huse & Zattoni, 2008).

ACs are represented by; size, composition, active and independent participation, presence of external and independent directors, share ownership by directors, existence of audit committees, separation of positions between the CEO and the chairman of the board (Ferreira, 2012). For Iyengar, Land, and Zampelli (2010), Silveira (2002), Silveira et al. (2004) and Thomsen (2005), the BoD is one of the main mechanisms of CG in driving the alignment of interests with reflection on the management of agency problems.

The effectiveness of governance practices, thus, cannot be seen only cumulatively, of the type “the more, the better”, one should consider the study of the interrelationship of these practices with the joint effectiveness in relation to agency conflicts (Parente & Machado, 2020), whose problems are prevalent in Brazil, particularly in the relationship between controlling shareholder, overlapping management, and minority shareholders (Brandao & Crisóstomo, 2015; Claessens & Yurtoglu, 2013). According to Brandão et al. (2017), the presence of independent members on the board of directors reduces these conflicts, and the associated costs, from monitoring expenses and incentives, expenses with granting contractual guarantees; and residual costs resulting from managers' actions.

For Denis and Mcconnell (2003) and Silveira (2010) researches on CG can be gathered into three major generations of studies, considering objectives of: (i) evaluating the impact of certain isolated mechanisms on corporate performance and decisions made; (ii) impact of the legal and investor protection system on corporate decisions and the companies' value; (iii) impact of the quality of CG on the companies' value or performance, considering the integrated form of different governance mechanisms, by governance indexes or ratings.

Considering the first generation, Brazilian and international studies seek to relate the effect of CAs on performance (Correia, Amaral, & Louvet, 2014; Johl, Kaaur, & Cooper 2015; Cunha & Piccoli, 2017; Chiu et al., 2013; Toigo, Hen, & Wubrel, 2018; Dani, Pamplona, & Cunha, 2019; Palhares et al., 2019). Other research aims to explain the structure of CAs by characteristics of the firms themselves, for example Holtz et al. (2013), whose study concludes that variables related to firm size, intangible assets, debt, participation in the new market or level 2 of Corporate Governance of B3 S&A and operating cash flow can explain the size of the board of directors of firms listed on B3 S&A, corroborating with results obtained by Boone et al. (2007), Link, Netter and Yang (2008), Guest (2008), Chen and Najjar (2012) for other markets.

Chen and Najjar (2012), for example, when studying on Chinese firms, positive and significant relationship between board size and supervisory bodies, firm size, firm value and financial performance, while negatively associated with ownership concentration. Al-Naif (2014), further, examined associations between board size and firm characteristic, i.e., size, age, leverage, and profitability in ASE industrial share in the recent period from 2005 to 2012. The multiple regression results provide empirical evidence that the all four variables are significant determinants of board size.

## 2.2 Study Hypotheses

Holtz et al. (2013) and Al-Naif (2014), suggest in their researches the need for further studies on variables that explain the Boards of Directors. Thus, this study aims to contribute to the literature by empirically and longitudinally testing the influence of potential determinants on the size of the boards of directors of companies listed on B3 S/A.

In relation to the determinant ‘company size’, larger companies are more complex and tend to engage in more diverse activities, which are likely to result in monitoring and advising of a more intense nature (Linck et al., 2008). From an agency perspective, larger firms are generally subject to higher monitoring costs and information asymmetries (Leuz & Verrecchia, 2000). In addition, resource dependence theory proposes that market environmental analysis increases as a direct function of firm size (Neupane & Neupane, 2017). It is thus expected that larger firms will need larger and more independent boards, as they can potentially bring greater experience and knowledge to offer them better advice (Boone et al., 2007; Lehn et al., 2009). Thus, hypothesis 1 is proposed: firm size is positively related to board size.

About ownership structure, as measured by the determinants percentage of total shares (common and preferred)

and percentage of common shares with the largest shareholder, it is estimated that voting concentration is a factor that influences board structure and also functions as a corporate governance mechanism (Uhlener et al., 2007). Agency theory has predominantly been used to explain the relationship between ownership structure and board structure (Bekiris, 2013). In this regard, a larger board structure leads to alignment of interests, preventing opportunistic actions (Raheja, 2005; Linck et al., 2008). A consistent board structure, furthermore, is decided when related to the entrenchment of executive directors to maintain their power on the board (Plastow et al., 2012). Therefore, hypothesis 2 is proposed: firm ownership structure is negatively related to board size.

Regarding the determinant ‘performance’, it follows the alignment advocated by Chen and Najjar (2012), in which board size is positively associated with firm value and financial performance, corroborating the findings of Mak and Li (2001), Adams and Mehran (2005), and Dalton and Dalton (2005). Thus, we have hypothesis 3: firm performance is positively related to board size.

### 3. Methodology

The research follows a quantitative approach, as it uses statistical techniques to verify the relationship between study variables (Oliveira, 1997). It has a descriptive nature, given the search for information about the board structure, in particular, the size, as well as other characteristics of the companies listed on the B3 S/A. In this sense, Prodanov and Freitas (2013) the descriptive research follows the record and writing of the facts observed without interfering in them, taking the form of survey, for seeking characteristics of a given population, phenomenon or the establishment of relationships between variables.

Secondary data from the Com.dinheiro.com database are used, by paid access contracted with the aforementioned base. The population of this study comprises the companies listed on B3 S/A, and the collection is restricted to the period from 2014 to 2019, making a total of 194 companies. The final year, 2019, was defined due to the context of the crisis derived in the pandemic of the new coronavirus, mid-2020, which could result in a major change in the data, due to the economic crisis resulting from the pandemic.

The study variables are: company size (TAMA), as a dependent variable, represented by the number of effective directors. As independent variables, the size of the company (related to the lg of the company’s assets); ownership structure (related to the percentage of common and preferred shares by the majority shareholder), in addition to the control category (representing a specific type of controlling shareholder); and, performance (measured by profitability through the EBITDA margin). And, of control, the gender of the board of directors and the year were used. In the first phase, the descriptive statistics technique was used, by means of the mean, standard deviation, asymmetry and kurtosis to present the profile of the study sample and the secondary data of the indicators extracted to carry out the next stage of the analysis.

Subsequently, the data analysis technique was used through multiple linear regression, which, according to Fávoro et al. (2009), studies the linear relationship between two or more explanatory variables and a metric dependent variable. To this end, the heteroscedasticity and multicollinearity tests of the data were performed, as well as the F statistic was performed to verify the significance of the model at the 1% level, so that the variables used could explain the dependent variable, in this case, the size of the board of directors.

### 4. Results

From the criteria defined for selection, the final sample of the study was set at 194 publicly traded companies listed on the Brazilian Market. The descriptive statistics of these companies, results of the data analysis, based on the years 2014 to 2019, are presented in Table 2.

Table 2. Descriptive statistics of the collected samples

	N	M ímo	M áimo	M édia	Assimetria		Curtose	
	Estat ítica	Estat ítica	Estat ítica	Estat ítica	Estat ítica	Std. Erro	Estat ítica	Std. Erro
SUBSETOR	1068	0,00	1,00	,2996	,876	,075	-1,235	,150
ADETAMCADM	1068	0,00	1,00	,7734	-1,308	,075	-,290	,150
DUALCADM	1068	0,00	1,00	,8558	-2,029	,075	2,119	,150
INDECADM	1068	0,00	1,00	,5272	-,109	,075	-1,992	,150
TIPOCONTROL	1068	1,00	6,00	1,7584	1,329	,075	,211	,150
QMTADM	1063	0,00	20,00	6,5748	1,078	,075	2,587	,150
GENERO CEO	1056	0,00	1,00	,9858	-8,222	,075	65,731	,150
GÊNERO DO PRESIDADM	1051	0,00	1,00	,9363	-3,576	,075	10,812	,151
ACIONISTATOTAL	925	5,11	100,00	42,1881	,742	,080	-,304	,161
ACIONISTAON	925	5,11	100,00	49,4511	,336	,080	-,923	,161

TAMANHO	1068	0,00	26,64	14,2080	,294	,075	-1,381	,150
IDADE	1062	3,00	145,00	43,5132	,771	,075	-,035	,150
SEGMENTO	1056	0,00	1,00	,4517	,194	,075	-1,966	,150
MEBITDA	1062	-21688,92	55946,32	7,3905	20,905	,075	646,715	,150
ANO	1062	1,00	6,00	3,4901	,009	,075	-1,173	,150

Source: Output do software.

As for the profile indicators of the listed companies, the variable ‘subsector’ presented a mean (0.2996), with positive asymmetry or to the right of (0.876), which shows that most companies in the study are part of medium and low complexity sectors. The negative kurtosis value of (-1.235) corresponds to a platykurtic distribution, that is, with observations relatively dispersed around the mean.

Another profile variable is ‘asset size’ in this variable the mean was (14.2080), with positive or right skewness of (0.294), indicating that most are small and medium-sized companies. Combined with the negative kurtosis value of (-1.381), this corresponds to a platykurtic distribution, that is, with observations relatively dispersed around the mean.

The ‘age’, in average of (43.51), in the business maturity path indicated by the positive asymmetry of (0.771), with negative kurtosis value (-0.035) corresponding to observations dispersed around the mean.

Regarding the latest data obtained on the profile of the companies analyzed, 45.71% are not listed on the Novo Mercado or Level 2 segment of the B3 S/A for corporate governance quality standards. And regarding the year, the period between 2016 and 2017 is possibly the best results expected by these companies.

Regarding the indicators of the ‘BD’ dimension, the ‘adequacy of the board’ presented a mean (0.7734), with observations that presented a negative asymmetric distribution or to the left (-1.308), where most of the listed companies presented a BD adequate to the IBGC requirements (in this case, between 5 and 11 members). The negative kurtosis value of (-0.290) corresponds to a platykurtic distribution, that is, with observations relatively dispersed around the mean.

To the “functions exercised by the CEO (chief executive officer) and chairman of the board”, the mean of (0.8558) and negative or left asymmetry of (-2.029), it was concluded that, most companies showed that the functions of the board are exercised by different people. The positive kurtosis (2.119) indicates a high and concentrated distribution around the mean. Therefore, there is an adequate Board of Directors, in accordance with the appropriate recommendations for an efficient internal mechanism for CG. As for ‘board Independence’, the analysis of the mean (0.5272) and negative skewness (-0.109) shows that there is a higher concentration of listed companies with at least one independent board member. The negative kurtosis (-1.992) corresponds to a platykurtic distribution, i.e., with observations relatively dispersed around the mean. Most have at least one independent board member. As for the ‘number of board members’, it presented a mean (6.5748), with observations that presented a positive or right-symmetric distribution (1.078). The positive kurtosis with a value of (2.578) indicates a high and concentrated distribution around the mean.

And about ‘gender of the CEO’, the mean of 0.9858 and negative or left asymmetry of (-8.22). The positive kurtosis (0.6553) indicates a high and concentrated distribution around the mean. And, the ‘gender of the board chairman’ showed a mean of (0.9363) and negative or leftward asymmetry of (-3.576). The positive kurtosis value (10.812) indicates a leptokurtic distribution, that is, with a higher distribution and relatively concentrated around the mean. In both cases, it was concluded that most of the CEOs and the Chairman of the Board of the listed companies are male.

For the determinant of ‘Ownership Structure’, it was evidenced that, considering the average of (49.4511) and positive asymmetry of (0.336) of the ‘percentage of common shares with the largest shareholder’, there is a higher concentration of listed companies with a low total percentage of voting shares in the hands of the controlling shareholder. This fact is congruent with the mean (42.1881) and positive asymmetry of (0.742) of the “percentage of total shares (common and preferred) held by the largest shareholder”, thus reinforcing a concentration of listed companies, also with a low quantity of shares held by their controlling shareholders. The negative kurtosis of both, (-0.922) and (-0.304), respectively, leads to a relative dispersion around the averages.

Regarding the ‘type of control’, the average of (1.7584), with positive asymmetry (1.329) and positive kurtosis (0.211). It can be seen that, in the context of these companies studied, the multinational or group of investors of foreign origin is the largest shareholder of the company, followed by the State (Union, States or Municipalities).

To evaluate corporate performance, the MEBITDA was used, which measures the productivity and efficiency of

companies, known as operational cash flow, because “the greater the company’s ability to generate cash, the greater its value to the market and, consequently, the better the quality and effectiveness of management in relation to the resources that were invested” (Melo, Almeida, & Santana, 2012, p. 109). Considering the average of (0.7390) and positive asymmetry of (20.905), it is evident that, most of the listed companies of the study are with the index below the average, representing that the expectation of cash flow generated was positive, but not so high. The positive kurtosis (646.71) indicates a concentration of observations around the mean.

Generally, the companies in the study have been configured with acceptable standards of corporate governance, given their compliance with the recommended requirements, which, potentially, may have repercussions on efficient internal mechanisms in mitigating the agency conflicts of these companies.

Following the data analysis, table 3 reports the results obtained through multiple regression.

Table 3. Results achieved through multiple regression

VARIABLES	COEF.	ROBUT.STD.ERR.	T	P>T	[95% CONF.	INTERVALO
CONTROL TYPE	<b>0,10</b>	<b>0,06</b>	<b>1,81</b>	<b>0,07</b>	-0,01	0,21
EXISCOMREMU	-0,38	0,28	-1,35	0,18	-0,94	0,17
GENDER CEO	<b>-1,81</b>	<b>0,51</b>	<b>-3,57</b>	<b>0,00</b>	-2,81	-0,82
GNEROPRESCONS	<b>0,69</b>	<b>0,34</b>	<b>2,03</b>	<b>0,04</b>	0,02	1,35
CONCMAIORTT	<b>-0,03</b>	<b>0,01</b>	<b>-3,87</b>	<b>0,00</b>	-0,04	-0,01
CONCMAIORON	0,01	0,01	1,24	0,22	0,00	0,02
SIZE	<b>0,07</b>	<b>0,02</b>	<b>3,87</b>	<b>0,00</b>	0,03	0,11
AGE	0,00	0,00	-1,12	0,26	-0,01	0,00
SEGMENT	0,22	0,19	1,17	0,24	-0,15	0,58
ROE	0,00	0,00	0,50	0,62	0,00	0,00
ROA	0,41	0,27	1,53	0,13	-0,12	0,94
ROIC	0,00	0,00	-0,67	0,51	0,00	0,00
GIRODOATIVO	-40,53	26,95	-1,50	0,13	-93,41	12,35
MEBITDA	<b>0,00</b>	<b>0,00</b>	<b>-1,67</b>	<b>0,10</b>	0,00	0,00
YEAR	<b>-0,26</b>	<b>0,07</b>	<b>-3,69</b>	<b>0,00</b>	-0,40	-0,12
_CONS	8,25	0,61	13,48	0,00	7,05	9,45

Source: Prepared by the author.

Note.  $F(15, 1052) = 7,06$ , Prob > F = 0,0000, R-squared = 0,0883

Analyzing the F statistic of the regression, which tests whether there is a significant relationship between the dependent variable and the explanatory variables, the probability of finding F statistic equal to or greater, when the null hypothesis is true, corresponds to 0.000, so it can be stated that the proposed model is significant at a confidence level below 0.001, allowing the conclusion that at least one of the independent variables is significantly different from zero.

Regarding the model, it can be noted that the coefficient of determination  $R^2$ , which reports the degree of adjustment of the model’s straight line indicating the proportion of the dependent variable explained by the predictor variables is about 0.0883, i.e., about 8% of the total variation in the dependent variable (true score) can be explained by changes in the explanatory variables entered the model.

Initially, the variable ‘type of control’, the positive coefficient indicates that, keeping constant the other variables contained in the model, leads to an average addition of the ‘true score’ of 0.10. The variable ‘gender of the CEO’ had a negative and statistically significant coefficient indicating that, keeping constant the other variables in the model, it leads to an average increase of the ‘true score’ of -1.81. Whereas the variable ‘Gender of Chairman of the Board’ showed a positive and statistically significant coefficient indicating that the gender of the chairman, keeping constant the other variables contained in the model, leads to an average increase of the ‘true score’ of 0.69.

The variable ‘Percentage of total shares in the hands of majority shareholders’ presented a negative and statistically significant coefficient, indicating that, keeping constant the other variables contained in the model, it leads to an average increment of the ‘true score’ of 0.03. The variables ‘size’ and ‘MEBITDA’ showed positive and statistically significant coefficients indicating that both positively influence the size of the board and, holding constant, the other variables contained in the model. On the contrary, the variable ‘year’ showed a negative and statistically significant coefficient indicating that, keeping constant the other variables contained in the model, it leads to an average increase of the ‘true score’ of -0.26.

Based on the study hypothesis: H1- Company Size is Positively Related to Board Size, this was confirmed according to the studies of (Leuz & Verrecchia, 2000; Linck et al., 2008; Boone et al., 2007; Lehn et al., 2009; Neupane & Neupane, 2017). Whereas Board Size Showed Positive Coefficient.

In Hypothesis 2- The Ownership Structure Of The Company Is Negatively Related To Board Size, It Was Confirmed, Corroborating The Studies Of (Uhlener et al., 2007; Raheja, 2005; Linck et al., 2008; Plastow et al., 2012; Bekiris, 2013).

Hypothesis 3 - Company Performance is Positively Related to Board Size. It was also confirmed, as per the Studies Of (Chen & Najjar, 2012; Mak & Li, 2001; Adams & Mehran, 2005; Dalton & Dalton, 2005). It is important to explore the following result, despite the ownership structure negatively influencing board size, in line with the theoretical framework, the category of controller, in this case, control in the hands of a foreign shareholder, positively explains the size of the board, given that a more robust board of directors aims to ensure greater confidence to minority shareholders, given their foreign profile, in this case, operate in a different stock market from their origin.

And as for the Gender Explanation of Board Size, it is perceived that the CEO's Male Gender has a negative influence, while the same gender of the Chairman of the Board has a positive influence.

## 5. Concluding Remarks

Aiming to analyze the determinants of the BD size of companies listed on B3 S/A; and, specifically, to identify the characteristics of the BD and the relationship of the BD size with its accounting determinants, the research to verify the linear relationship between the dependent variable 'size of the board of directors' and the other independent variables, the multiple linear regression model was applied, which suggests that the size of the board was explained by the company size, ownership structure and performance, confirming the three proposed hypotheses.

Of the variables included in the model company size (TAMA), intangible assets (INTA), indebtedness (ENDI), and operating cash flow (FCOP) were statistically significant, since they had a positive sign, indicating that larger companies with higher intangible assets and more indebtedness have larger boards of directors.

One can perceive, through the reported results, how willing companies are (or will be) to make decisions in favor of better corporate governance practices, through internal mechanisms, in this case, the Boards of Directors, since they correspond to a relevant structure and should be analyzed when credited for minimizing agency problems arising from the relationship between the principal and the shareholder. At the same time, the image reported in the stock market about such structural constitutions of corporate governance are positive indications of valuation in the market where they operate.

As a limitation, it can be verified by the restricted choice of independent variables that explain size. While it is suggested for future studies the use of other dependent variables that portray the board structure, as well as the use of more characteristics of the companies, whether accounting or not, and by other more robust statistical techniques. In particular, broadening the understanding of the explanation of the structure of Boards of Directors in other contexts and stock markets will allow for the modeling of different boards of directors to understand best practices in corporate governance.

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