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Executive Compensation and Performance of Companies in the Brazilian Capital Market: Evidence of Negative Relationship with Focus on the Interests of the Controlling Shareholder

Remuneração Executiva e Desempenho de Companhias no Mercado de Capitais Brasileiro: Evidências de Relação Negativa com Foco nos Interesses do Acionista Controlador

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Abstract: This study aims to analyze the relationship between executive compensation and performance in public companies listed on the Brazilian capital market – [B]^3 Brasil Bolsa Balcão. Theoretically, the study is based on the agency theory focusing on the principal-principal perspective of agency conflict. The sample comprised the 100 companies with the highest liquidity in the trading of shares listed on the [B]^3 during the 2010-2015 period, totaling 488 observations. Six hypotheses were developed, and several variables were measured to test the relationship between executive compensation and performance. For the selected sample, the results of the estimated econometric models indicate that executive compensation has a negative relationship with variables performance, presence of family on the board of directors, voting rights shares, and the duality of two share classes, voting and non-voting. The results also indicate a negative relationship between ownership concentration and performance and a nonsignificant relationship between executive compensation and family control. The synthesis of the results indicates that the corporate governance

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model adopted by Brazilian public companies prioritizes the interests of the controlling shareholder instead of executive compensation.
Keywords – Executive compensation; Corporate performance; Corporate governance; Brazilian capital market; Agency Theory.

Resumo: Este estudo tem como objetivo analisar o relacionamento entre a remuneração executiva e o desempenho de companhias abertas brasileiras listadas no mercado de capitais brasileiro – [B]^3 Brasil Bolsa Balcão. Do ponto de vista teórico, o estudo se baseia na teoria da agência com foco na perspectiva do conflito de agência do tipo principal-principal. A amostra foi composta pelas 100 companhias com maior liquidez em quantidade de negociações de ações listadas na [B]^3 no período de 2010-2015, totalizando 488 observações. Foram elaboradas seis hipóteses de pesquisas e mensuradas diversas variáveis para testar a relação entre a remuneração executiva e o desempenho. Os resultados dos modelos econométricos estimados demonstram que, na amostra selecionada, a remuneração de executivos possui relação negativa com as variáveis desempenho, presença de familiares no conselho de administração, ações com direito a voto e dualidade de classes de ações, com e sem direito a voto. Verificou-se ainda uma relação negativa entre concentração da propriedade e desempenho e uma relação não significante entre remuneração de executivos e controle familiar. A síntese dos resultados indica que o modelo de governança corporativa adotado pelas companhias abertas brasileiras prioriza os interesses dos acionistas controladores ao invés da remuneração de executivos.
Palavras-chave – Remuneração executiva; Desempenho corporativo; Governança corporativa; Mercado de capitais brasileiro; Teoria de Agência.

Introduction

In this paper, we investigated the relationship between executive compensation and performance in Brazilian public companies listed on the [B]^3 – Brasil Bolsa Balcão. For that, we articulated two main topics, corporate governance (Blair, 1995) and executive compensation (Conyon & He, 2011; Conyon & Murphy, 2000), based on agency theory (Baixauli-Soler & Sanches-Marin, 2015; Young et al., 2008; Jensen & Mekling, 1976).

The analysis of specialized literature on executive compensation and performance indicates a predominance of studies related to the Anglo-Saxon context anchored in agency theory (Braga & Pimentel, 2017; Ntim et al., 2015; Pukthuanthong et al., 2004; Bebchuk & Fried, 2003; Rao & Lee-Sing, 1995). In this context, corporate governance is characterized by the separation of ownership and control,

and executive compensation is configured as an alignment mechanism between ownership and control and the reduction of type I agency conflict between principal and agent (Konraht et al., 2018; Souza et al., 2017; Baixauli-Soler & Sanches-Marin, 2015; Young et al., 2008; Jensen & Murphy, 1990; Smith & Watts, 1982).

Unlike what occurs in the context of developed countries such as the United States of America (USA) and the United Kingdom (UK), the context of the Brazilian capital market is characterized as small, underdeveloped, and lacking transparency in its institutional relations (Bortolon & Silva Junior, 2015; Sarlo Neto et al., 2005; Nóbrega et al., 2000) with companies typically characterized by the presence of ownership concentration (Carvalhal, 2014; Leal & Bortolon, 2009; Sarlo Neto et al., 2005), the presence of family relationships on the board of directors (KPMG, 2015; Velloso and Grisci, 2014; Costa et al., 2014), and a lack of transparency regarding the disclosure of information on executive compensation (Pinto & Leal, 2012). In this context, the agency conflict assumes the type II configuration involving the principal-principal conflict (Baixauli-Soler & Sanches-Marin, 2015; Young et al., 2008), and the executive compensation can be used by the majority shareholder to expropriate the minority, whereas the absence of transparency may draw attention to the weak sensitivity of executive compensation to organizational performance (La Porta et al., 1999; Silva & Leal, 2006).

Despite these characteristics of the Brazilian capital market, it is observed in the national literature the presence of studies that investigate the relationship between executive compensation and performance based on the type I agency problem involving the relationship between the principal and the agent (Konraht et al., 2018; Braga & Pimentel, 2017; Souza et al., 2017), a typical aspect of capital markets of Anglo-Saxon countries (Baixauli-Soler & Sanches-Marin, 2015; Young et al., 2008). As a way of differentiating, the present research was conducted considering the characteristics of the Brazilian capital market having as a foundation the type II agency problem that involves the relationship between majority and minority shareholders, the concentration of ownership, and the presence of family control in companies present in the [B][3] (Bortolon & Silva Junior, 2015; Baixauli-Soler & Sanches-Marin, 2015; KPMG, 2015; Velloso & Grisci, 2014; Costa et al., 2014; Carvalhal, 2014; Pinto & Leal, 2012; Leal & Bortolon, 2009; Young et al., 2008; Sarlo Neto et al., 2005; Nóbrega et al., 2000). This

theoretical approach represents an innovation in researches on executive compensation and performance of Brazilian listed companies, thus extolling the relevance of the study

To explore these themes in the context of the Brazilian capital market, this study seeks to ascertain the factors that explain compensation in the context of corporate governance, ownership structure, and the performance indicators and characteristics of the company to determine whether these factors are linked to incentive contracts. In short, this study seeks to answer the following research question: **What is the relationship between executive compensation and performance in Brazilian public companies listed on the [B]^3 – Brasil Bolsa Balcão?** In other words, this study aims to analyze the determinants of executive compensation in Brazilian public companies listed on the [B]^3.

To that end, six hypotheses on the conditions of executive compensation are developed, considering the characteristics of the Brazilian capital market (Carvalhal, 2014; Leal & Bortolon, 2009; Sarlo Neto et al., 2005; KPMG, 2015; Pinto & Leal, 2012) and the potential conflict of interest from the perspective of the "principal-principal" type of agency problem (Young et al., 2008), more specifically concerning the relationship between majority and minority shareholders in family-run business groups (KPMG, 2015; Pinto & Leal, 2012; Black et al., 2008). Also, two econometric models were used. In the first econometric model, the accounting performance indicators and the analyzed companies' market were adopted as dependent variables, and the average individual executive compensation and ownership concentration were adopted as independent variables. In the second econometric model, executive compensation was adopted as the dependent variables and the ownership concentration and family firm control were adopted as independent variables.

The article is structured into five sections in addition to the introduction presented here. The theoretical framework and research hypotheses are presented in the next section. Section 3 presents the methodology that guided the procedures for collecting and analyzing the data. Section 4 presents the research results. Section 5 presents the discussion, and the sixth and final section presents the research conclusions.

Theoretical Framework and Research Hypotheses

In this section, we present the theoretical framework that supports the formulation of six research hypotheses on the conditions of executive compensation. For that, we take into account the characteristics of the Brazilian capital market (Carvalhal, 2014; Leal & Bortolon, 2009; Sarlo Neto et al., 2005; KPMG, 2015; Pinto & Leal, 2012) and the potential conflict of interest between the majority and minority shareholders in family business groups (KPMG, 2015; Costa et al., 2014; Pinto & Leal, 2012; Black et al., 2008; Young et al., 2008).

In the context of uncertainties, information asymmetry, and limited transparency (as occurs in the Brazilian capital market), from the principal-principal perspective of agency problem (Baixauli-Soler & Sanches-Marin, 2015; Young et al., 2008), the interest in the determinants of executive compensation is to test the existence of a negative relationship between executive compensation and company performance, motivated by such factors as manager cronyism and cooptation by the majority shareholder (Duffhues & Kabir, 2008). To test the relationship, six research hypotheses were developed and will be presented below.

Hypothesis 1*: Ceteris paribus, there is a negative relationship between executive compensation and company performance.*

This first hypothesis was formulated based on the perspective that in emerging countries such as Brazil with a nascent capital market, the controlling shareholder (in most cases, in family companies) has the responsibility to hire and to decide executive compensation. Thus, the pay system can be used only to satisfy the majority shareholder interest, to the detriment of the minority shareholder (La Porta et al., 1999; Silva & Leal, 2006; Barontini & Bozi, 2009).

In this case, the majority shareholder establishes a form of collusion and enforcement with the executive to make decisions only in favor of the majority shareholder and not in favor of company performance, thus expropriating the resources of the minority shareholders (Young et al., 2008). La Porta et al. (1999) and Faccio et al. (2001) note that expropriation can be legal, illegal, or hybrid. Some examples are (1) the hire of a non-qualified family member to the managerial team; (2) the purchase of supplies and services above market prices or selling products and services below market prices in

dealing with companies owned by a controlling shareholder; and (3) the shareholder expropriation can take place via tax-shifting from the board to outside shareholders.

In their study on companies in the Netherlands, Duffhues and Kabir (2008) found evidence that executive compensation has a negative relationship with company performance. One possible explanation for this result, in the authors' opinions, is collusion between the majority shareholders and the managers. This collusion may be beneficial for both: the majority shareholder may obtain advantages such as receiving a high dividend pay-out or remaining a special supplier or client of the firm, and the managers may have other interests than compensation, such as maintaining access to decision-making power and the resources of the company and continuing their employment (Duffhues and Kabir, 2008).

Complementarily, the findings of Barontini and Bozzi (2011) in an investigation of Italian companies listed on the Milan Stock Exchange indicate that in family firms, the executive compensation is negatively correlated with company performance. According to the authors, the presence of the family firm's founder on the board of directors is an inducer of an inefficient compensation policy.

In Brazil, Silva and Chien (2013) found no significant evidence that companies that compensate their executives the most have better operating performance and higher value. Souza et al. (2017) and Konraht et al. (2018) also demonstrate the absence of statistical significance between executive compensation and market performance. Considering that Brazilian public companies are predominantly family firms, a negative relationship is expected between executive compensation and company performance.

Hypothesis 2*: Ceteris paribus, there is a negative relationship between ownership concentration and company market value.*

The formulation of the second hypothesis is based on the contributions of Marques et al. (2015), Pinto and Leal (2013), Claessens et al. (2002), and Faccio et al. (2001). For these authors, the ownership concentration has as a consequence, among other issues, the expropriation of minority shareholder resources by the majority shareholder through the entrenchment effect.

Marques et al. (2015) report that high ownership concentration can induce the controlling

shareholder to expropriate minority shareholder resources, trying to extract the private benefits of control, which implies both a higher cost required for agency monitoring and a lower value of the firm, causing the entrenchment effect. In other words, the heightened concentration of control rights under the controlling shareholder and the separation between control rights and cash flow increases the agency conflict between majority and minority shareholders and penalizes the company market value.

This postulation of Marques et al. (2015) is consistent with the findings of Claessens et al. (2002). As a result, they "also find a negative entrenchment effect with large controlling shareholders: increases in control rights by the largest shareholder are accompanied by declines in firm values. This negative effect is particularly severe for large deviations between control and ownership rights" (Claessens et al., 2002, p. 2770).

Hypothesis 3*: Ceteris paribus, there is a negative relationship between variable executive compensation and family company control.*

As emphasized above, in the Brazilian capital market, most companies are family-controlled firms (Oliva & Alburqueque, 2007). According to Zellweger and Astrachan (2008) and Memili et al. (2013), family firms are characterized by a long-term orientation, in the sense of the maintenance and perpetuation of the family's wealth over the generations. In this case, Hiebl (2013) and Memili et al. (2013) indicate a tendency that in a family firm, the executives receive lower compensation than in a non-family company.

These considerations are consistent with the perspective of the principal-principal agency conflict and divergent from the perspective of the principal-agency conflict. In the first type of agency conflict, the majority shareholder has the power to supervise the executive actions with pressure to expropriate the company's wealth in his/her own interest (La Porta et al., 1999; Silva & Leal, 2006). In this case, the orientation is towards the long-term corporate objectives and goals. In the second type of agency conflict, which is characteristic of the Anglo-Saxon context, the possible divergence of interest between shareholder and manager is treated by the mechanism of executive compensation as a means to enforce the manager's actions in favor of the shareholder (Galdi & Carvalho, 2006). For this purpose, the

strategy used by the principal is to harness the executive compensation to company performance with an orientation towards the short term (Jensen & Meckling, 1976; Rao & Lee-Sing, 1995).

Hypothesis 4*: Ceteris paribus, there is a positive relationship between variable executive compensation and the presence of family in company management (Chief Executive Officer - CEO, board of director, directors, and chairman).*

The formulation of the fourth hypothesis was based on the considerations of Barontini and Bozzi (2011), Cohen and Lauterbach (2008), Pinto and Leal (2013), and Haid and Yurtoglu (2014). These authors conducted studies in Italy, Israel, Brazil, and Germany, respectively, and found a positive relationship between executive compensation and the presence of family on the board of directors. In general, the main argument is that the executive compensation in a family firm is a consequence of a family strategy to hire family members at the top of the control chain (Barontini & Bozzi, 2011). Cohen and Lauterbach (2008) found that a CEO who belongs to the family receives significantly higher compensation than a CEO who does not belong to the controlling family group. For Abraham and Singh (2016), this behavior of executive pay is more rooted in the individual company pay culture or some other institutional company characteristic.

As described by Abraham and Singh (2016, p. 97) for "the corporate governance prevalent within this variation of Brazil capitalism, it is not uncommon for family-controlled companies to combine the position of Chairman of the Board and Corporate Executive Officer (CEO) in a single person". This phenomenon is known as CEO duality and characteristically places the CEO in a powerful position of managing the firm operations and also overseeing the direction the firm will take in the future. In most Brazilian public companies, the single person who acts in a position of CEO duality is the majority shareholder himself or somebody hired by him that acts to expropriate the company's wealth and the resources of the minority shareholder. These considerations are consistent with the expropriation thesis, in which the majority shareholder appropriates the company's wealth via paying higher compensation to a family CEO.

Hypothesis 5*: Ceteris paribus, there is a negative relationship between variable executive*

compensation and the percentage of majority voting right shares.

This fifth hypothesis was formulated based on the contributions of Crisostomo and Brandão (2019) and Crisostomo et al. (2020) and the conclusions of Pinto and Leal (2013) regarding the investigation of a sample of 315 Brazilian public companies between the years of 2009 and 2010. The authors found a negative relationship between executive compensation and share concentration, suggesting that the lower the ownership concentration, the higher the executive compensation. In other words, firms with a lower degree of ownership concentration pay more to their top managers and directors.

These findings are consistent with the postulation that the controlling shareholder can contain executive compensation easily, but the difficulty increases when the company has no relevant majority shareholder and the dispersed shareholders have little incentive to effectively monitor executive compensation, so the top managers can determine their own compensation (Pinto & Leal, 2013; Bebchuk & Fried, 2003).

Hypothesis 6*: Ceteris paribus, there is a negative relationship between variable executive compensation and the presence of dual share classes, voting, and non-voting.*

Silveira et al. (2004), Claessens et al. (2002), and Marques et al. (2015) reported that dual-class shares (voting and non-voting, in Brazilian terms, "ordinária" and "preferencial", respectively) affect the control maintained by the majority shareholders. Silveira et al. (2004) add that in the Brazilian capital market, the use of non-voting shares ("preferenciais" shares) represents the main severing mechanism between cash-flow rights (participation in the company's total capital) and control rights (decision-making power), which is most pronounced in family-controlled firms, as noted by Claessens et al. (2002). Based on Silveira el al. (2004), Claessens et al. (2002), and Marques et al. (2015), this study assumes that, with increasing access difference between the majority and minority shareholders to control rights and cash-flow rights, the expropriation potential of the minority increases, and consequently executive compensation decreases.

Having explained the six hypotheses, it is relevant to present the variables used in the research and the operationalization of the testing the hypotheses. The hypotheses were tested based on independent variables in the regression models. The Return on Assets (ROA) and Return on Equity (ROE) were used as variables related to accounting performance, as in the studies conducted by Canarella and Gasparyan (2008), Conyon and He (2011), and Chang et al. (2012). To implement the variables concerning the company's value, Tobin's Q and the market value were used, according to the studies by Pukthuanthong et al. (2004) and Silva and Chien (2013).

Also, some independent variables such as ownership concentration and corporate governance were adopted. For ownership concentration, Marques et al. (2015) maintain that high ownership concentration is related to the expropriation of the minority shareholder resources by the controlling shareholder. In this case, the majority shareholder can extract the private benefits of control, which implies both higher cost requirements for agency monitoring and, a lower value of the firm, causing the entrenchment effect. Conyon and He (2011), Pinto and Leal (2013), and Silva and Chien (2013) also found evidence for a negative relationship between ownership concentration and company market value.

Regarding the adoption of corporate governance and executive compensation best practices, previous studies have noted that companies with a weak governance structure tend to compensate their executives better (Silva et al., 2012) because good governance practices reduce the need for high compensation, as there are other types of incentives and monitoring and a lower tendency to expropriate the agent. Corporate governance was measured using the [B][3]'s differential levels.

Concerning the relationship between company size and executive compensation, Jensen and Meckling (1976) note that larger companies hire the best executives to maximize their performance. Bootsma (2010) adds that larger companies are more difficult to manage and therefore seek to attract the best executives by offering above-average compensation. Previous studies have presented strong empirical evidence that compensation increases with firm size (Canarella and Gasparyan, 2008; Ali Shah et al., 2009; Banghoj et al., 2010). Also, studies suggest a positive relationship between executive pay and the size of the executive board because a larger executive board is more difficult to monitor, resulting in higher salary levels (Banghoj et al., 2010).

Furthermore, control variables related to the companies' characteristics were included in the model, including ownership control and the structure of variable compensation such as bonuses and stock options. Previous studies suggest that private equity-controlled companies have a higher level of compensation (Pinto & Leal 2013) and that sectoral specificities can influence executive compensation. Table 1 lists the operational definitions of the explanatory variables and the expected relationships with executive compensation.

Table 1

Variables used in the research

Dependent Variable *		**Measurement Mode**		
Return on Assets (ROA)		Net income on total assets		
Return on Equity (ROE)		Net income on equity		
Tobin's Q (TQ)		Tobin's Q of the i-th company in the t-th year. A simple approximation of Tobin's Q is expressed by the following formulation (Chung and Pruitt, 1994): Tobin's Q = (MVE + PS + DEBT) / TA, where MVE is the product of a firm's share price and the number of common stock shares outstanding; PS is the liquidation value of the firm's outstanding preferred stock; DEBT is the value of the firm's short-term liabilities set against its short-term assets, plus the book value of the firm's long-term debt, and TA is the book value of the total assets of the firm.		
Variable Compensation (VAR PAY)		Average percentage of variable compensation		
Independent Variables		**Measurement Mode**	**Relationship ****	**Hypothesis *****
Characteristics of the Companies and Boards of Directors	Number of executives	Total number of the company's executives	+	CV
	Size	Total value of the company's assets	+	CV
	Sector	Dummy variable for each sector of activity of the company.	+/-	CV
	Nature of the controlling interest (CONTROL)	Dummy variable: 1 if the controlling interest is state-owned, 0 if it belongs to the private sector	-	CV
	Stock options plan	Dummy variable: 1 if the company has a stock options plan, 0 otherwise	+	CV
	Variable compensation plan	Dummy variable: 1 if the firm has a variable compensation plan, 0 otherwise	+	CV
Corporate Governance	Differential level of [B]^3 (GOV)	Dummy variable for each [B]^3 level: Level 1, Level 2, and the Novo Mercado (New Market)	+	CV
Executive Compensation	Individual average compensation; Total executive compensation	Years 2010, 2011, 2012, 2013, 2014, and 2015: Average individual compensation value (fixed and variable compensation); Composition of the incentive package.	-	H1

Ownership Structure	Ownership concentration (OWC)	Percentage of stock ownership of the three largest shareholders	-	H2
Family Company Control	Presence of family in company control (DUMMY FAM)	Dummy variable: 1 if the family is involved in company control, 0 otherwise	-	H3
	Percentage of family control with voting shares (%FAM)	Percentage of the presence of family members in the company control	-	
Presence of Family in company management (CEO, board of director, directors, and chairman)	Family member as company CEO (CEOFAM)	Dummy variable: 1 if the family member is the CEO, 0 otherwise	+	H4
	Presence of family members on board of directors (BOARDFAM)	Dummy variable: 1 if the family member is on the board of directors, 0 otherwise	+	
	Family member as company director (DIRFAM)	Dummy variable: 1 if the family member is company director, 0 otherwise	+	
	Family member as chairman (CHAIRMANFAM)	Dummy variable: 1 if the family member is chairman, 0 otherwise	+	
Percentage of Majority Voting Rights Shares	Percentage of majority voting shares (MAJORON)	Percentage of voting rights shares of the majority shareholders	-	H5
Presence of Dual Share Classes: Voting and Non-voting	(DUAL CLASS)	Dummy variable: 1 if the company has dual shares classes, 0 otherwise	-	H6

Source: Research data.
Note: (i) * Dependent variable of the general research model; ** Expected Value: "+" in the case of a positive relationship; "-" in the case of a negative relationship; *** Related hypothesis according to section 2.2, whereas control variables do not have specific hypotheses. (ii) CV: control variable.

Research Method

Data and Research Sample

A quantitative approach with an empirical-analytical focus was employed in this study. The research universe comprises Brazilian public companies listed on the Stock Exchange of São Paulo in

the years 2010, 2011, 2012. 2013, 2014, and 2015 (six years). The choice of this period was based on the advent of normative instruction CVM 480/2009, which required companies to disclosure reference forms with compensation data beginning in the year 2010.

The sample was selected based on the liquidity of shares of non-financial listed companies, i.e., the greater amount of settlement negotiations according to the Economatica database. The sample selection by the liquidity criterion was based on the assumption that low-liquidity companies have a lower probability of having adequate prices compared to their real market value (Silveira et al., 2003). Because there is no accepted standard in the literature to determine a satisfactory degree of liquidity, the number of companies established for the sample was based on the concern for the sample size to conduct valid inferences and meet the assumptions of the econometric model. It is worth noting that, considering the nature of documentary research, the lack of data and the low quality of the disclosure imposed limitations on the analysis for the entire stock market. In this sense, executive compensation studies on the Brazilian capital market have undertaken analyses that consider the most representative companies based on their liquidity volumes and presence in stock market indices (Carvalho & Devidé Junior, 2012; Araújo & Ribeiro, 2017; Oliveira & Silva Junior, 2018; Konraht et al., 2018; Brandão et al., 2019), being relevant for corporate governance research because it comprises companies with greater visibility and market presence in Brazil (Crisóstomo & Brandão, 2020).

Based on the above criteria, 100 companies for each year of the analytical period were selected; however, four observations were excluded due to a lack of data, creating a model that features an unbalanced panel. Only the action class of the company, as the largest volume for each year, was considered. Thus, 488 observations for the years 2010 to 2015 were generated. These are significant numbers for the number of listed companies relative to the turnover and trading volume of the selected companies, in addition to being relevant compared to other studies undertaken on executive compensation in Brazil.

The information refers to secondary data from the Economática software, the Thomson Reuters software, and section 13 of the References Forms of the companies available on the website of the Brazilian Securities Commission (Comissão de Valores Mobiliários - CVM). Appendix “A” lists the data

source for each variable of the sample. Appendix "B" presents the number of companies by sector, showing that, except for financial, all 10 market sectors, as classified by the [B][3], are represented in the sample.

Empirical Models

In the domestic and international literature, there is no consensus on modeling the relationship between executive compensation and performance. However, executive compensation is typically explained based on a set of conditions that normally correspond to the characteristics of the companies and their executives and performance indicators from a time series (Carvalho & Devidé Junior, 2012).

Thus, the models used in the study were proposed by the authors, based on previous studies (Young et al., 2008; Renders & Gaeremynck, 2012; Baixauli-Soler & Sanches-Marin, 2015; Konraht, 2018) to measure the sensitivity of performance and corporate value to the executive compensation package and other company characteristics, including variables that have been ignored, or have been poorly tested in studies on executive compensation in the Brazilian capital market (Aguiar & Pimentel, 2017; Souza et al., 2017; Brandão et al., 2019), such as degree of ownership concentration, degree of the presence of family members in the company, degree of majority voting rights shares, and the presence of dual share classes (voting and non-voting). All these company characteristics were considered to test the research hypothesis.

The data used were submitted to multivariate linear regression analysis, which consisted of a regression model that employed a statistical technique to analyze the relationship among a dependent variable and several explanatory variables (Hair et al., 2009). Quantitative variables were used to represent the values of the attributes that can be counted or measured in each sample element and that are dichotomous, taking only two values and commonly used to express the absence (or otherwise) of element attributes.

The panel data technique was used in estimating the models, combining sectional and temporal data. The use of the panel data technique enables the analysis of the same companies in different periods, providing a dynamic analysis of the relationships among variables. The use of this technique is

highly appropriate for this study, while also allowing improvement in the estimators, control of the unobserved differences, and a reduction in multicollinearity problems and the magnitude of the bias of omitted variables (Wooldridge, 2010), thus ensuring greater reliability in the econometric modeling.

To conduct data analysis, multiple approaches were used, including the following: pooled ordinary least squares, random effects, pooled ordinary least squares with cluster-robust standard errors, and random effects with cluster-robust standard errors. Considering econometric aspects, the possible endogeneity effect, and reverse causality, the Generalised Method of Moments (GMM-Sys) was used, as it has proven more effective than other approaches. For succinctness, only the general models GMM-Sys Equations 1 and 2 were used in this research.

$$performance = \alpha + \beta_1 compensation_{it} + \beta_2 ownership_{it} + \sum_{j=1}^{k} \delta_j Control_{ji} + \varepsilon_i \quad (1)$$

$$v.compensation = \alpha + \beta_1 majoron_{it} + \beta_2\, family_{it} + \sum_{j=1}^{k} \delta_j Control_{ji} + \varepsilon_i \quad (2)$$

Note:
Performance is the financial or operational performance of the ith company, as represented by the following indicators: *ROAit* (net income divided by the total assets of the ith company), *ROEit* (net income divided by the equity capital of the ith company), and *Q(TB)it* (value of the ith company, as represented by de Tobin's Q of the ith company and the market value);
$\beta_1 compensation$ is the dependent variable represented by the total individual average compensation of the ith company;
$\beta_2 ownership$ is the percentage of shares owned by the three largest shareholders of the ith company;
v.compensation is the total variable compensation;
α is the intercept, i.e., the average value of the variable compensation, considering the nonexistence of values for the explanatory variables;
$\beta_1 majoron$ is the percentage of voting shares ("ordinárias" shares) of the majority shareholders;
$\beta_2 family$ is a set of variables related to the presence of family on the company control;
$x\delta\, Control$ is the reduced form for several other explanatory variables, exercising a control function in the model and described in Table 1; and
ϵi is an error term that captures the unsystematic component, the share of variables not explained by the model.

The Winsorising procedure was used to treat the outliers of the sample to avoid issues due to a lack

of normality. The extreme values were eliminated using a proportion p of 0.02, i.e., 2% of each part of the tail, top, and bottom.

The low correlation in the explanatory variables is important for the model because a high correlation would result in low efficiency, given that the variables would present an exact linear combination. Table 2 shows the correlation matrix of the variables employed in the research. The highest correlation was not observed among the variables, except for the ROA and ROE variables, which were used in different models.

Table 2

Matrix of correlations between variables

Vars	ROA	ROE	TQ	COMPENSATION	VAR PAY	DIRECTOR NUMBER	BOARD SIZE	FIRM SIZE	OWC	MAJORON	%FAM
ROA	1.000										
ROE	**0.809**	1.000									
TQ	0.560	0.480	1.000								
VARPAY	0.187	0.118	0.094	1.000							
COMPENSATION	-0.016	-0.008	0.096	0.047	1.000						
DIRECTOR SIZE	0.054	-0.096	-0.226	0.058	0.274	1.000					
BOARD SIZE	-0.134	0.008	0.168	0.031	0.218	0.054	1.000				
FIRM SIZE	0.090	-0.060	-0.177	0.065	0.144	0.120	0.031	1.000			
OWC	-0.143	-0.006	-0.064	-0.166	-0.210	0.024	-0.046	-0.082	1.000		
MAJORON	-0.014	-0.028	-0.081	-0.070	-0.110	0.209	-0.169	0.084	0.480	1.000	
%FAM	-0.016	-0.046	0.057	-0.180	-0.118	-0.258	-0.196	-0.180	0.160	0.465	1.000

Source: Research data.

Note: (i) Correlations below an acceptable level (0.80) are highlighted in bold, according to the classification of Gujarati (2006). (ii) Definitions of the variables: ROA: Return on assets; ROE: Return on equity; TQ: Tobin's Q; VARPAY: Variable

compensation; Compensation: Average individual compensation; DIRECTOR NUMBER: Number of executive directors; BOARD SIZE: Size of the board of directors; FIRM SIZE: Total assets; OWC: Ownership concentration degree measured by the percentage of shares owned by the three largest shareholders; MAJORON: Percentage of voting rights shares of the majority shareholders; %FAM: Percentage of the presence of family members on the company control.

Analysis and Discussion of the Results

To synthesize and describe the data, descriptive statistics are used. Appendix C summarises the general data relating to executive compensation, the size of the board of directors, and other quantitative variables. The results show that the annual executive compensation in the companies selected by the sample ranges from R$ 518.172,00 to R$ 201.989.886,00 leading to an average of R$ R$ 20.092.069,96 and a high value of standard deviation. These results show that companies have different compensation systems. Some companies have larger boards of directors than others; the variable of the size of the board of directors evidences this factor with broad dispersion, ranging from 2 to 31 executives. It is also observed that companies have an average stock concentration of 51.2%. In Appendix D the descriptive statistics of the categorical variables show that most companies that comprise the sample are private equity-controlled companies and belong to the New Market segment of the [B][3].

Concerning the econometric analysis, Table 3 presents the results of the linear regression model related to the first econometric model with Tobin's Q (company value), ROA (company performance), and ROE (company performance) as dependent variables. We used the dynamic model from panel data by the GMM-Sys method, which has the advantage of eliminating no observed effects in regressions and provides a more reliable estimated parameter controlling the endogenous effects and omitted variables (Arellano & Bond, 1991).

Table 3

Regression results

$$performance = \alpha + \beta_1 compensation_{it} + \beta_2 ownership_{it} + \sum_{j=1}^{k} \delta_j Control_{ji} + \varepsilon_i$$

		QT (1)	ROA (2)	ROE (3)
Intercept	β	10.680***	16.766***	17.264***
	se	(1.249)	(7.084)	(15.1955)
TQ (*t*-1)	β	0.6605***		
	se	(0.066)		
ROA (*t*-1)	β		0.521***	
	se		(0.0501)	
ROE (*t*-1)	β			0.4993***
	se			(0.0650)
COMPENSATION	β	0.0268	-.9664***	-1.413*
	se	0.0776	(.4367)	(0.8850)
OWC	β	-0.4631*	-0.0165* (0.0184)	-0.0561**
	se	(0.246)		(0.038)
%FAM	β	-0.5086*	0.0196	0.3805
	se	(0.002)	(0.0167)	(0.0363)
FIRM SIZE	B	0.0767 ***	0.2298**	1.037**
	se	(0.0369)	(.2079)	(0.391)
GOV	β	0.3073***	2.68***	2.956**
	se	(0.017)	(1.223)	(2.336)
BOARD_FAM	β	-0.5324*	-4.579**	-10.540***
	se	(0.121)	(2.392)	(4.442)
CHAIRMAN_FAM	β	0.1245	0.801	1.4415
	se	(0.1507)	(0.8562)	(1.884)
DIR_FAM	β	0.2649	3.70	6.079
	se	(0.546)	(0.103)	(7.308)
CEO_FAM	β	-0.3611**	-1.835*	-3.040 *
	se	(0.1159)	1.217	(2.870)
CONTROL	β	-0.0398*	-2.917***	-6.705***
	se	(0.0644)	(1.394)	(2.692)
N.obs.		488	488	488
R^2		0.4815	0.4036	0.4476
AR1		0.029	0.023	0.016
AR2		0.189	0.340	0.171
Hansen (J)		0.498	0.542	0.521
Diff-Hansen (C)		0.396	0.341	0.492
VIF Mean		1,55	1,99	1,44

Source: Research data.

Note: (i) ***, **, and * represent significance at 1%, 5%, and 10%, respectively. (ii) Standard errors are reported in parentheses. (iii) For the sector dummies according to the Economática classification, *yes* means that at least one was significant, and *no* means otherwise. (iv) Definitions of the variables: TQ: Tobin's Q; ROA: Return on assets; ROE: Return on equity; COMPENSATION: Average individual compensation; OWC: Ownership concentration degree measured by the

percentage of shares owned by the three largest shareholders; %FAM: Percentage of the presence of family members in the company control; FIRM SIZE: Total company assets; GOV: Dummy variable = 1 if the company belongs to Level 1, 2 or the Novo Mercado (New Market) according to the [B][3] classification; BOARD FAM: Dummy variable = 1 if the family member is on the board of directors and 0 otherwise; CHAIRMAN FAM: Dummy variable = 1 if the chairman belongs to the family with control of the company and 0 otherwise; DIR FAM: Dummy variable = 1 if the CEO belongs to the family with control of the company and 0 otherwise; CEO FAM: Dummy variable = 1 if the CEO belongs to the family with control of the company and 0 otherwise and CONTROL: dummy variable = 1 if the nature of the controlling interest is state owned.

The results of the linear regression model related to the first econometric model verified that the variable executive compensation presented a negative relationship with both performance variables, ROA (0.01 significance) and ROE (0.10 significance). The relationship between executive compensation and company market value (Tobin's Q) was not statically significant. These results indicate that the first hypothesis (H1) cannot be refuted.

As reported by La Porta et al. (1999), Silva and Leal (2006), Young et al. (2008), and Barontini and Bozi (2009), in emerging countries such as Brazil, it is not uncommon for public companies to be controlled by majority shareholders, in most cases in the context of a family firm. In this type of company, the majority shareholder has the power to hire and to fire the executive as well as to determine the compensation package. Furthermore, the majority shareholder can establish a form of enforcement with the executive to expropriate the company's wealth in his own favor and to the detriment of the minority shareholder interests.

The result of this first hypothesis is consistent with the results of the studies conducted in Brazil by Silva and Chien (2013), Souza et al. (2017), and Konraht et al. (2018) who found no significant evidence between executive compensation and performance. They are also consistent with international studies such as those by Duffhues and Kabir (2008) and Barontini and Bozzi (2011), who found a negative relationship between executive compensation and company performance. As these authors explain, the collusion between the majority shareholders and managers may be beneficial for both and detrimental to the minority shareholders and the company's performance. In this case, the majority shareholder can materialize his own interests, such as by receiving a high dividend pay-out, and managers may have other interests than compensation, such as maintaining employment and access to the decision-making process, at the expense of possible losses to the minority shareholders and the company, suggesting that

compensation plans do not represent the alignment of interests as advocated by the traditional agency theory proposed by Jensen and Mekling (1976).

The regression results indicate that the variable ownership concentration presented a negative and statistically significant relationship with company value (measured by Tobin's Q) and company performance (measured by ROA and ROE). Thus, the second hypothesis (H2) cannot be refuted. This negative relationship suggests that higher ownership concentration is associated with lower company performance and value.

These results are similar to the findings of Claessens et al. (2002), and Faccio et al. (2001) and to the studies on the Brazilian context conducted by Pinto and Leal (2013) and Marques et al. (2015). According to these authors, the consequences of ownership concentration include the expropriation of minority shareholder resources by majority shareholders through the entrenchment effect. As noted by Marques et al. (2015), the highest concentration of company control in the hands of one or two majority shareholders allows the majority shareholder to exercise control rights and access the cash flow to maximize his own interests, penalizing the minority shareholders and the company market value.

Concerning the control variables, it was verified that the variables company size and a differentiated corporate governance level according to [B][3] have a positive relationship with company market value and performance. On the other hand, public control of the ownership structure was found to have a negative relationship with company market value and performance. These results are expected, as noted in Table 1.

The analysis of the variables related to the presence of family in the company control showed pertinent results, with the expected signal presented in Table 1. The percentage of family control with voting rights (%FAM) has a negative and statistically significant relationship with company market value and no significant relationship with company performance. The presence of family members on the board of directors (BOARD FAM) has a negative and statistically significant relationship with company performance and no significant relationship with company market value. The presence of a family member occupying the CEO position of the company has a negative and statistically significant relationship with company performance and market value.

These results are consistent with the postulates of Zellweger and Astrachan (2008) and Memili et al. (2013). For these authors, family firms are characterized by a long-term orientation, that is, these companies implement strategies to maintain and perpetuate the family's wealth over the generations. For this reason, the company performance and market value are treated as long-term objectives and goals, so that in general, a negative relationship is expected between the presence of family in control of the company and the company performance and market value.

The second econometric model tested the other four hypotheses of the research (H3, H4, H5, and H6). This model has the variable compensation as a dependent variable. Regression numbers 4 and 5 considered the explanatory variables of ownership structure and the degree of family control, respectively. Regression number 6 considers all explanatory variables, representing the general model. The results of the estimates and the validation testing of the model are presented in Table 4.

Table 4

Regression results

$$v.compensation = \alpha + \beta_1 majoron_{it} + \beta_2\, family_{it} + \sum_{j=1}^{k} \delta_j Control_{ji} + \varepsilon_i$$

		VAR PAY (4)	VAR PAY (5)	VAR PAY (6)
Intercept	β	11.156***	9.180***	9.5060***
	se	(1.039)	(.8900)	(0.8803)
VAR PAY (*t*-1)	β	0.4680***	0.3754***	0.3452***
	se	(0.0581)	(0.0579)	(0.0565)
FIRM SIZE	β	4.8509***	7.480***	9.6109***
	se	(3.3608)	(3.2309)	(3.0209)
DIRECTOR SIZE	β	0.0677***	0.0579***	0.0521***
	se	(0.0116)	(0.0121)	(0.0134)
BOARD SIZE	β	0.0683***	0.0549***	0.0490***
	se	(0.0169)	(0.0284)	(0.0187)
GOV	β	-0.572***	-0.105	-0.0270***
	se	(0.2432)	(0.093)	(0.0084)
MAJORON	β	-0.0025*		-0.0070 **
	se	(0.003)		(0.0025)
DUAL CLASS	B	-0.3961**		-0.2380***
	se	(0.262)		(0.1189)
CONTROL	β	-0.965***	-0.965***	-0.934***
	se	(0.1320)	(0.1320)	(0.130)
DUMMYFAM	β		0.199	0.1828

	se		(0.126)	(0.1311)
%FAM	β		-3.76	0.0024
	se		(0.002)	(0.002)
BOARD_FAM	β		-0.596***	82713***
	se		(0.2657)	(0.275)
CHAIRMAN_FAM	β		0.0526	0.0250
	se		(0.0924)	(0.0934)
DIR_FAM	β		0.0239	-0.2644
	se		(0.355)	(0.3457)
CEO_FAM	β		-0.246**	2614**
	se		(0.1497)	(0.077)
N.obs.		488	488	488
R^2		0.4494	0.4496	0.4382
AR1		0.018	0.032	0.033
AR2		0.190	0.170	0.171
Hansen (J)		0.630	0.592	0.598
Diff-Sargan/Hansen (C)		0.498	0.386	0.394
VIF Mean		1.44	1.44	1.44

Source: Research data.

Note: (i) ***, **, and * represent significance at 1%, 5%, and 10%, respectively. (ii) Standard errors are reported in parentheses. (iii) For the sector dummies according to the Economática classification, *yes* means that at least one was significant, and *no* means otherwise. (iv) Definitions of the variables: VAR PAY: Average percentage of variable compensation; FIRM SIZE: Total assets; DIRECTOR SIZE: Size of the board of management (management structure); BOARD SIZE; Size of the board of directors (ownership structure); GOV: Dummy variable = 1 if the company belongs to Level 1, 2 or the Novo Mercado (New Market) according to the [B][3] classification; MAJORON: Percentage of voting rights shares of the majority shareholders; DUAL CLASS: Dummy variable = 1 for voting shares ("ordinarias" shares) and 0 for non-voting shares ("preferenciais" shares); CONTROL: Dummy variable = 1 if the controlling interest is state owned and 0 if it belongs to the private sector; DUMMYFAM: Dummy variable = 1 if the family is in the company control and 0 otherwise; %FAM: Percentage of the presence of family members in the company control; BOARD FAM: Dummy variable = 1 if the family member is on the board of directors and 0 otherwise;; CHAIRMAN FAM: Dummy variable = 1 if the chairman belongs to the family with control of the company and 0 otherwise; DIR FAM: Dummy variable = 1 if the family member is company director and 0 otherwise; CEO FAM: Dummy variable = 1 if the CEO belongs to the family with control of the company and 0 otherwise.

Regarding the robustness and validation of the econometric models, the Arellano and Bond (1991) test for detection of first and second-order autocorrelation (AR1 and AR2) in waste rejected and accepted respectively the hypothesis of absence of serial correlation in all specifications of the models, as indicated by Arellano and Bond (1991). In turn, the Hansen over-identifying test (J) and the difference-in-Sargan/Hansen test (C) did not reject the null hypothesis that the instruments used with lagged variables are valid.

The analysis of the second econometric model via linear regression model allowed the testing of the third research hypothesis (H3). As previously observed, the DUMMYFAM and %FAM variables

showed no statistically significant relationship between variable executive compensation and family company control. In this case, hypothesis H3 was refuted as not statically significant.

These results are not congruent with the theoretical framework that justified the hypothesis formulation. Thus, as expected, the long-term orientation that characterizes family firms (Zellweger and Astrachan, 2008; Memili et al., 2013; Hiebl, 2013) and the possibility that the majority shareholder expropriates the minority shareholder resources and the company's wealth (La Porta et al., 1999; Silva & Leal, 2006; Young et al., 2008; Barontini & Bozi, 2009) do not influence the relationship between executive compensation and family company control. These issues may be explained by the conclusion of Abraham and Singh (2016, p. 112) in a study of Brazilian companies that the "behaviour of executive pay is more rooted in the individual company pay culture or some other company characteristic". In this case, these results must be understood through the Brazilian capital market characteristics and the organizational culture of the Brazilian public company.

In the analysis of the fourth hypothesis (H4) involving the relationship between variable executive compensation and the presence of family on the board of directors, the variables BOARD FAM and CEO FAM presented a negative and statically significant relation with VAR PAY. These results allow the rejection of hypothesis H4.

As it expected based on the theoretical framework that justified the formulation of hypothesis H4, the relationship between executive compensation and the presence of family on the board of directors should be positive. These results differ from the findings of Barontini and Bozzi (2011), Cohen and Lauterbach (2008), Pinto and Leal (2013), and Haid and Yurtoglu (2014), in studies conducted in Italy, Israel, Brazil, and Germany, respectively, which found a positive relationship between executive compensation and the presence of family on the board of directors. These authors justified their results via the argument that the executive compensation in a family firm is a consequence of a family strategy to hire family members at the top of the control chain to maximize the family interest and to expropriate the company's wealth (Young et al., 2008; Faccio et al., 2001).

A possible explanation for the rejection of hypothesis H4 can be related to the same explanation as hypothesis H3, that is, company pay culture and/or some other company characteristic (Abraham and

Singh, 2016) and/or the Brazilian capital market characteristics and/or the organizational culture of the Brazilian public company. The comprehension of all these issues depends on future investigations, which may be conducted via qualitative or quantitative research methods or a combination.

The analysis of the fifth and the sixth hypotheses (H5 and H6, respectively) indicates, in both cases, a negative relationship between variable executive compensation and the percentage of majority voting rights shares (H5) and between variable executive compensation and the presence of dual share classes (voting and non-voting). In both cases, hypotheses H5 and H6 cannot be rejected.

The results regarding hypothesis H5 are consistent with the findings of Bebchuk and Fried (2003) and the results of Pinto and Leal (2013) for the Brazilian context. For these authors, the negative relationship between executive compensation and shares concentration is justified by the fact that the majority shareholder can easily monitor executive action and compensation. Apparently, in the Brazilian public company, the majority shareholder exercises his ability to monitor and to maintain the executive compensation at a lower level. In this sense, Crisostomo and Brandão (2019), analyzing the Brazilian market from the perspective of agency theory, point out that high ownership concentration makes the holders of the controlling block powerful enough to use private benefits of control and able to shape corporate governance mechanisms, including compensation plans, to favor their own interests.

The results regarding hypothesis H6 are consistent with the findings of Claessens et al. (2002) and the results of Silveira et al. (2004) and Marques et al. (2015) in the Brazilian context. For them, the dual-class shares (voting and non-voting) enforce the majority shareholder control. The dual-class shares represent a severing mechanism between cash-flow rights and control rights that increases the expropriation potential of the company's wealth and decreases the executive compensation. Crisostomo et al. (2020) argue about the relevance of the type II agency problem (principal-principal) characteristic of the Brazilian capital market since minority shareholders are unable to challenge the power exercised by the majority and controlling shareholders.

Based on the estimation of coefficients and statistical significance shown, Table 5 summarises the signs and results obtained for the research hypotheses, wherein hypotheses H3 and H4 are refuted while H1, H2, H5, and H6 cannot be refuted.

Table 5

Summary of the results

Hypotheses	Methodology	Expected Relationship	Relationship Found	Sig.
H1: there is a negative relationship between executive compensation and company performance.	GMM-Sys	-	-	Not refuted *
H2: there is a negative relationship between ownership concentration and company market value.	GMM-Sys	-	-	Not refuted *
H3: there is a negative relationship between variable executive compensation and family company control.	GMM-Sys	-	-	Not statistically significant
H4: there is a positive relationship between variable executive compensation and the presence of family in company management (CEO, board of director, directors and chairman).	GMM-Sys	+	-	Refuted *
H5: there is a negative relationship between variable executive compensation and percentage of majority voting rights shares.	GMM-Sys	-	-	Not refuted *
H6: there is a negative relationship between variable executive compensation and the presence of dual share classes: voting and non-voting.	GMM-Sys	-	-	Not refuted *

Note: (i) * A significance level of 1%, 5%, or 10% was obtained in at least one of the estimated models.

Conclusions

This research contributes to the field by expanding the findings regarding executive compensation and studies related to company performance, corporate governance, and capital markets. The results highlight the explanation potential of agency theory on executive compensation in emerging economies such as Brazil. In this case, the explanation of the phenomenon was possible via an alternative perspective of agency conflict – the "principal-principal" conflict.

The synthesis of the results indicates that for the Brazilian public companies listed in [B][3], the executive compensation has a negative relationship with variables performance, presence of family on

the board of directors, voting rights shares, and the duality of two share classes, voting and non-voting. The results also indicate a negative relationship between ownership concentration and performance and a nonsignificant relationship between executive compensation and family control. So, the results signalize that the corporate governance model adopted by Brazilian public companies prioritizes the interests of the controlling shareholder instead of executive compensation.

From a practical perspective, the study contributes to the discussion about the need to pay special attention to the compensation model as an internal corporate governance mechanism in the Brazilian capital market context. In this context, the conflict of interests between the "majority shareholder and executive representing him/her" and the "minority shareholder", the agency problem may imply either an increase or decrease in information asymmetry. The increase or reduction depends on how the majority shareholder uses his/her power and the incentive to act in his/her own interests.

The study has certain limitations regarding the research and the methods used, which encourages the performance of further studies to overcome them. Namely, it is noteworthy that only the different levels of [B][3] were used as proxies for governance, given the difficulty in collecting such data in Brazil. Furthermore, the study lacks an analysis of the effect of the determinants on the compensation of the CEO, which is still unfeasible in Brazil because of the non-disclosure of information regarding compensation per executive (as occurs in the international scene). Such an analysis would be interesting because the CEO tends to obtain greater gains from the share of total executive compensation disclosed by the company. Another limiting factor results from the impossibility of performing widely longitudinal studies, as occurs in more developed countries, given the lack of information preceding the approval of CVM Normative Instruction (Instrução Normativa - IN) 480/2009. Nevertheless, information asymmetry and the characteristics inherent to the structure and ownership in emerging countries may affect the actual monitoring of executive compensation.

Building on the approach employed here, further research could adopt new variables to measure corporate governance issues (for example, the corporate governance index), accounting performance, company value, and ownership structure, in addition to the use of statistical tests of new factors using a larger time horizon. Another interesting approach would be to increase the sample size or to verify the

relationship between compensation and performance in private capital companies, an area that remains underexplored due to a lack of data. Benefits and non-financial compensation could also be explored in the Brazilian context or to broaden the understanding of the effect of performance on other types of variable compensation, such as profit sharing and other financial incentives. From another methodological perspective, it might be relevant to conduct qualitative studies to deepen the discussions on the principal-principal perspective of agency conflict, particularly investigating the Brazilian institutional context and organizational culture of public Brazilian companies, in most cases family firms. The family influence in family firms in the Brazilian capital market may have a strong influence on executive compensation, and these issues cannot be wholly captured by quantitative approaches.

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Appendix

Appendix A – Research data sources

Variable	Source of data	Year
Companies	Economática	2012
Sector	Economática	2012
Public Capital/Private Capital	Economática	2012
Company size (Total assets)	Economática	2010 - 2015
Company size (Net revenue)	Economática	2010 - 2015
Ownership concentration	References Form	2010 - 2015
Number of directors	References Form	2010 - 2015
Total director's compensation	References Form	2010 - 2015
Stock options	References Form	2010 - 2015
Variable compensation	References Form and Comdinheiro	2010 - 2015
ROA	Economática	2010 - 2015

ROE	Economática	2010 - 2015
Tobin's q	Economática	2010 - 2015
DummyFam	Economática	2010 - 2015
%FAM	Comdinheiro	2010 - 2015
CEOFAM	Comdinheiro	2010 - 2015
BOARDFAM	Comdinheiro	2010 - 2015
DIRFAM	Comdinheiro	2010 - 2015
CHAIRMAMFAM	Comdinheiro	2010 - 2015
MAJORONFAM	Comdinheiro	2010 - 2015
DUALCLASS	Comdinheiro	2010 - 2015

Appendix B – Company sectors

Companies	Economic Sector
15	Noncyclic consumption
16	Cyclic consumption
19	Public interest
2	Industrial goods
11	Basic materials
4	Oil and gas
2	Information technology
3	Telecommunications
28	Construction and transport

Appendix C – Descriptive statistics of the numeric variables

Variable	Average	Standard Deviation	Minimum	Maximum
Total compensation	R$ 20.092.069,96	22.095.859.96	R$ 518.172,00	R$ 201.989.886,00
Board of directors	6.7	2.58	2	12
Ownership concentration	51.2	20.112	15.06	86.12
Total assets	1.460	1.520	993.25	5.930
Market value	13.880	0.940	14.201	17.476
Return on assets	5.98	5.106	-4	18.9
Return on equity	12.56	11.989	-8.6	40.1
Tobin's q	1.371	1.21	0.12	4.31
Majoron	46.088	28.61	0	100
%Fam	31.019	27.40	0	100

Note: Number of observations: 488

Appendix D – Descriptive statistics of the categorical variables			
	Ownership Control		
1	Public Capital	48	9.84%
0	Private Capital	440	90.16%
	ADR Emission		
1	Emits ADR at levels II and III	98	20.08%
0	Does not emit ADR	237	79.92%
	Segment level of [B][3]		
	Traditional and level 1	120	24.59%
	Level 2	24	4.92%
	New Market	344	70.49%

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