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# Do corporate governance and managerial power induce abnormal CEO compensation contracts? an analysis of the Brazilian market

## *¿El gobierno corporativo y el poder gerencial inducen contratos anormales de compensación de los CEO? un análisis del mercado brasileño*

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**Abstract**

This research investigates the effect of corporate governance and managerial power in determining abnormal CEO´s compensation contracts. For this, we used a regression model with equations that measure the fair compensation of companies for each sector based on the CEO's ability, effort and performance characteristics, and we calculate the compensation, overpayment and underpayment from the residual of the equations. Subsequently, we analyzed the effect of governance practices and managerial power using overpayment and underpayment as dependent variables, over ten years (2011-2020), analysing companies from Brazil Stock Exchange - B3. We found that governance mechanisms and practices which reduce CEO´s power can be effective in obtaining fairer compensation packages regarding the overpayment. However, by analyzing insufficient compensation, we realized that such mechanisms and practices are not capable of adjusting compensation contracts, indicating that CEOs tend to influence compensation contracts to increase their gains, but they do not do so to reduce them to insufficient values.

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**Resumen**

Esta investigación investiga el efecto del gobierno corporativo y el poder gerencial en la determinación de contratos de compensación anormales de los CEO. Para ello utilizamos un modelo de regresión con ecuaciones que miden la compensación justa de las empresas para cada sector en función de la capacidad, el esfuerzo y las características de desempeño del CEO, y calculamos la compensación, sobrepago y insuficiente pago a partir del residual de las ecuaciones. Posteriormente, analizamos el efecto de las prácticas de gobernanza y el poder de gestión utilizando pagos excesivos y pagos insuficientes como variables dependientes, durante diez años (2011-2020), analizando empresas de la Bolsa de Valores de Brasil - B3. Descubrimos que los mecanismos y prácticas de gobernanza que reducen el poder de los directores ejecutivos pueden ser eficaces para obtener paquetes de compensación más justos en relación con el pago excesivo. Sin embargo, al analizar la compensación insuficiente, nos dimos cuenta de que tales mecanismos y prácticas no son capaces de ajustar los contratos de compensación, lo que indica que los directores ejecutivos tienden a influir en los contratos de compensación para aumentar sus ganancias, pero no lo hacen para reducirlas a valores insuficientes.

*Código JEL:* M12, M41, G34
*Palabras clave:* compensación anormal; poder gerencial; prácticas de gobierno corporativo; director ejecutivo (CEO)

## Introduction

Compensation contracts are mechanisms used to align interests (Coughlan & Schmidt, 1985), however, when managers abuse managerial power and use their privileges within organizations, they end up acting opportunistically and reducing the effectiveness of such contracts, for example: executives can receive large amounts of compensation without necessarily being linked to any organizational performance (Bebchuk & Fried, 2006; Ntim et al., 2019; Raithatha & Komera, 2016), so there are companies with excessive compensation (Brick, 2006; Core et al., 2008), as well as there may also be situations in which there are companies with insufficient compensation to adequately motivate the manager (Aguinis et al., 2018; Hitt & Haynes, 2018).

Bebchuk and Fried (2003) consider that managerial incentives, when not properly monitored, carry high costs imposed on shareholders caused by the influence of managers in defining their own salaries. In this sense, due to the excessive power of managers, executive compensation, which is considered one of the main interest alignment mechanisms, may, on some occasions, not be able to align interests effectively.

It is still not clearly resolved whether executive compensation has been economically reasonable for the executive's ability, effort required, and performance-based risk premium (Hill et al., 2016) as well as wheter the governance and managerial power structure (Elmagrhi et al., 2018; Ntim et al., 2019; Van

Essen et al., 2012) attenuates the unfair part of compensation, because the studies do not specifically address the aspects associated with the abnormal part of the compensation, which can be positive (overpayment) or negative (underpayment) (He & Fang, 2016). In fact, few executives are adequately remunerated, most of them are usually being excessively or insufficiently paid (Aguinis et al., 2018).

Compensation is made up of the fair part, as a product of the executive's ability, cost of effort and performance, in addition to the unfair part (Core & Gay, 2010). In this perspective, Core and Guay (2010) present abnormal compensation as the receiving of incentives above or below the understandable and fair levels by factors related to ability, effort required and performance achieved.

So, this paper proposes to seek an answer to the following question: What is the effect of corporate governance and managerial power in abnormal Chief Executive Officer - CEO compensation contracts?

Our research adds contributions in relation to Brick et al. (2006), Carter et al. (2016), Chung et al. (2015) Core et al. (2008), Hill et al. (2016), Wang (2018), for not only investigating excessive CEO compensation, but abnormal compensation (overpayment and underpayment). The contributions of our study are still perceived in relation to the studies by Aguinis et al. (2018), Dah and Frye (2017), Gyapong et al. (2020), Hitt and Haynes (2018), Ntim et al. (2019), Wang and Jiang (2017) who studied abnormal compensation, but considered the use of all the influential factors of normal compensation together, without observing what represents characteristics of fair compensation based on skill, effort and performance, as defined by Core and Guay (2010). Thus, our research has contributions for analyzing abnormal compensation according to representative characteristics of the ability, effort and performance of executives as representatives of the fair part of payments, taking into account the limitations of data availability in Brazil´s context. Finally, we investigate the effect of corporate governance and managerial power in determining economically unjustified CEO compensation packages in companies listed on the country's stock exchange.

## Literature review

### *Fair compensation*

We realize that both excessive and insufficient compensation can cause problems for an organization, either by expropriation or by inability to motivate the manager properly. From the point of view of justification, studies use the determinants of total executive compensation to identify abnormal compensation, whether excessive or insufficient.

Brick et al. (2006) used the regressions residual of a model that applies compensation as a dependent variable and as independent variables the characteristics of the firm and of the CEO, of the governance and time and industry dummies, based on the literature about determinants of compensation. Wade et al. (2006) used an equation with CEO salary, as the dependent variable, being the impacted by CEO duality, tenure, international responsibility, formal education time, company stability, logarithm of sales and return on assets.

Core et al. (2008) used a model with actual compensation minus expected compensation to identify overpayments. The study only looked for positive differences between actual and expected payments, resulting in an overpayment.

Our reserach goes beyond the factors of Brick et al. (2006), Core et al. (2008) and Schulz and Flickinger (2018) because it considers the distributive justice of compensation, as presented by Aguinis et al. (2018), which observes whether the executive receives payments proportionally to his contributions to the company. In this sense, the surplus and deficit of the standard economic determinants are used as representatives of abnormal executive compensation (Core et al., 2008), considering the determinants that reflect the fair part (Carter et al., 2016; Core & Guay, 2010).

From the perspective of fair values of synchronization between how much the executive is paid and how good his/her performance is, Core and Guay (2010) established an economic framework for determining the limits of sufficient incentives. The composition of the compensation is based on four items: (a) compensation for the executive's ability, referring to the minimum amount necessary to attract and retain the executive; (b) payment for the level of effort required by the executive; (c) performance-based incentive risk premium; and (d) any payment that represents the part that is unexplained by the other three components and that is likely resulting from agency conflicts and governance problems.

## *Ability as a determinant of fair CEO compensation*

First, as a determinant of compensation, there is the ability dimension. As the most talented people preside larger companies (Rosen, 1982), the company size can prove to be effective in predicting ability and, consequently, in justifying compensation derived from talent for taking the lead in the largest companies. Demerjian et al. (2012) state that managers of larger companies are more effective, which demonstrates the ability of those executives.

The CEO previous experience was used by Murphy and Zabojnik (2007) to reflect the importance of managerial ability. Additionally, Falato et al. (2015) used these proxies to measure executive ability: reputation (Press), career growth (Fast-Track Career) and university selectivity (Selective College), which are factors related to the CEOs´ experience. In the same sense, Custódio et al.

(2013) used the CEOs´ resumé experiences before their current position to build an index of general abilities.

The theory that deals with human capital denotes that the inclination to deal with a specific sector can be considered in the definition of ability (Becker, 1962) and, consequently, in the justification of salary levels. However, generic abilities seem to be relevant in the execution of management functions, especially in the work market with more talented managers (Murphy and Zabojnik, 2004).

The diversification of the company's operating segments is also accepted by Rose and Shepard (1994) for the definition of talent and managerial effort, which they claimed to be one of the factors that increase the CEOs' salary as it requires greater ability and effort. Executives who are responsible for companies operating in different segments must be equipped with greater ability to properly perform their functions in different activities fields.

Thus, the size of the company, the CEO's previous experience and the diversification of operating segments may be representative of the fair dimension of ability to determine the CEO's compensation.

## *Effort as a determinant of fair CEO compensation*

Second, related to the cost of the effort required from executives in their jobs as a fair form of compensation determinants, Barris (1992) states that payment must be visibly related to the actual responsibility that the executive carries in his/her functions. Company size can also be used to justify an amount of payments to executives because larger companies require a higher level of human capital, greater responsibility for the assets and are characterized as more complex (Aguinis et al., 2018).

In the same perspective, Conyon et al. (2009) demonstrated that a larger company size can be used to justify executive salaries, due to greater human capital requirements, operational complexity and greater responsibility. Albuquerque et al. (2018) identified the firm size as representative of business complexity because larger companies are likely to be more difficult to manage as they have a greater amount of resources on which executives must make decisions.

Demerjian et al. (2012) used both operational and geographic diversification as a measure of efficiency, showing that the greater the diversification, the more challenging the work for the team in efficiently allocating capital and, consequently, more ability will be required. The number of segments in which the company operates is used by Dah and Frye (2017) as a proxy for the complexity of the business. This demonstrates that working in several segments is a characteristic that raises the level of effort required from executives because it requires a greater breadth of knowledge, given the greatest challenge to be faced in business management.

Albuquerque et al. (2018) also used the number of company segments to represent the complexity of the company because companies with more business segments and with operations abroad operate in potentially more complex environments, being representative of managerial effort. Choi (2020) considers the diversification of the company's operations in several segments as an important characteristic of the company that reflects the general marginal productivity of the CEO's efforts.

Thus, both size and performance in diversified market segments can be determinants of the effort required as fair factors for the expected compensation of executives.

## *Performance as a determinant of fair CEO compensation*

Third and lastly, the performance is used as a characteristic of the justified portion of compensation. Murphy (1999) believes that bonuses should be paid to executives upon reaching some performance standard. Murphy (1999) also demonstrates that it is necessary to use some accounting measure such as revenue/sales ratio, Return on Assets (ROA) or Return on Equity (ROE). Such measures are representative of the organizational performance that take part of the performance achieved by the organization's management.

Tobin's Q measures and Market to Book are used to obtain the market performance of companies, while ROE and ROA are used as measures that represent the accounting performance (Zeitun & Tian, 2014). In the same vein, Rashid (2020) considers that both accounting measures such as ROA and ROE and market measuressuch as Tobin's Q and market-to-book can be used.

Both financial performance measures and market performance measures are considered fair factors in executive compensation, because they represent the good performance of management in the face of the challenges faced by the organization in the market. When the executive is remunerated and manages to provide higher levels of performance for the company, it must be considered that the compensation packages come from the performance achieved. Thus, representative measures of accounting and market performance can be proxies used as representative of the fair part of the determinants of expected executive compensation.

It is possible to perceive representative factors of ability and effort as similar, considering that the literature treats, in some cases, as representative factors of both. Methodologically, only one variable of each factor is used, being shown as representatives of both ability and effort.

## Development of hypotheses

### *Corporate governance and managerial power*

### *Board size*

According to the seminal study of Shleifer and Vishny (1997), corporate governance can be understood as the set of practices employed as a way of ensuring that capital providers are protected in terms of the return on their investments, ensuring management control to avoid expropriation and inappropriate projects that do not maximize the utility of capital providers.

Since CEO´s actions are monitored and evaluated by corporate boards (Jensen and Murphy, 1990), inadequate amounts of executive compensation are associated with weaker board monitoring (Dah & Frye, 2017). To adjust compensation contracts, the board can be perceived as an alternative of governance, which plays part of the supervisory role in preventing the expropriation of shareholder wealth (Chung et al., 2015). Boards that adequately perform the monitoring role increase the tendency to define an optimal compensation contract, in other words, with less tendency to abnormal compensation.

Board size and independence are the two most most widely studied characteristics of governance (Rashid, 2020). In this sense, Lo and Wu (2016) indicate that the less members there are in the boards, the better monitors they are, in addition, independent boards are more efficient in the management supervision and monitoring. Ali and Teulon (2017) found that the board size positively affects compensation packages.

Recently, Kalbuana et al. (2022) demonstrated that organizations with large boards are less able to monitor and make better decisions when compared to firms that have smaller boards. In the same vein, Githaiga et al. (2022) consider that large boards are ineffective in preventing managerial opportunism. For the authors, controlling the board size is part of an important set of attributes to mitigate managerial opportunism.

This can be attributed to the fact that larger boards face more conflicts of opinion, making board control less efficient. The improvement of corporate governance practices may be able to mitigate agency problems, such as the adoption of smaller boards. Boards with fewer members are more effective in monitoring, causing compensation contracts to be more adjusted in order to motivate the manager and reduce the chances of expropriation of shareholders. Thus, the size of the board may be able to positively influence abnormal compensation.

“H1. Board size is effective in reducing abnormal CEO compensation”

## *Gender diversity on the board of directors*

The study by Sarhan (2018) showed that pay for performance is more sensitive due to greater gender diversity measured by the member´s gender, ethnicity and nationality. Ullah et al. (2019) presented results that support the hypothesis of efficiency in the monitoring of managers by boards with female participation, which tends to reduce agency problems.

Increasing diversity in management can have beneficial effects for companies where good external governance does not exist, because companies with a higher percentage of female employees have lower agency costs (Ain et al., 2020). Guizani and Abdalkrim (2023) consider that gender diversity increases board's efficacy.

More recently, studies such as Alves (2023) and Ssekiboobo et al. (2023) demonstrated that gender diversity on the board is useful in reducing managerial opportunism. Furthermore, Tarkovska et al. (2023) results indicate that the presence of women on the board may influence salary justice, reducing inequalities. Given this, it's possibe to recognize the benefits of gender diversity on boards and it can be considered that the existence of more diverse boards reduces managerial opportunism, resulting in a abnormal compensation reduction.

More diverse boards are more likely to make decisions that serve the interests of the investor because women tend to be more risk averse. Thus, it is suggested that abnormal compensation is negatively influenced by gender diversity on the board of directors.

"H2. Gender diversity on the board is effective in reducing CEO abnormal compensation".

## *Independence of the board of directors*

Board independence can be considered an effective governance mechanism for aligning interests between agent and principal. Recently, Brandão et al. (2019) showed a negative association between the proportion of independent board members and the sensitivity of compensation to performance, which is consistent with more effective contracts in the presence of independent boards.

As the performance of CEOs is monitored, there is greater pressure for them to have their power to act reduced, generating a greater tendency for company decisions to be made in the interests of the investor. Therefore, it is preferable for the CEO to have his/her performance more effectively monitored by boards that are composed of external members, since they tend not to be close to the managers, not being led to decisions that seek to reach the agent´s interests rather than the principal´s interests.

In this circumstance, the proximity of non-external members to executives can generate a propensity for compensation contracts not to be prepared in a way that meets the shareholder's objectives, but rather, so that they reflect the managerial power derived from the close relationships between executives and members of the board of directors (Bebchuk et al., 2002), since one of the main problems related to managerial power is the influence of the CEO in setting the compensation packages.

Joura et al. (2023) use the managerial power theory, suggesting that executives can influence business decisions by affecting, among other factors, the definition of their own remuneration. The research results revealed that board independence has impact on managerial power and a consequent reduction in abnormal compensation.

In the same way, Lee (2023) considers that the size and independence of the board are effective in the performance of cooperative sustainability and, consequently, in its monitoring effectiveness. Given this, it can be considered that more independent boards tend to be more effective in monitoring, reducing the risk of managerial opportunism to avoid remuneration that exceeds acceptable limits.

What happens is that external directors generally do not have a relationship of familiarity with the company and the members who receive compensation, which may not occur when the directors have some other association with the company, in other words, they are not considered as external members. Therefore, to try to inhibit the excessive power of the CEO, it is necessary that his/her relationship with the board of directors be reduced. Compensation contracts, which should, in their entirety, meet the objectives of investors, can be designed to meet personal interests of executives who hold excessive power, generating ineffectiveness in compensation packages. In this way, the presence of external members on the board negatively influences abnormal compensation.

“H3. Board independence is effective in reducing CEO abnormal compensation”.

## *Advisory committees to the board of directors*

According to the Brazilian Institute Corporate Governance - IBGC (2015), committees can be considered as advisory bodies in organizations, where the existence of an audit committee represents a good corporate governance practice, so it is a supporting body for the board. In addition to the audit committee, some others advisory committees to the board such as governance, risk or finance committees may exist in companies.

Support bodies are responsible for advising specific functions from the board and, when related to the characteristics of good governance, are included to present information and to suggest actions that can be taken by the boards, aiming serve the shareholders.

Al-Ahdal et al. (2020) showed benefits of the audit committee for companies, considering it as corporate governance practices. Sharma et al. (2020) use the audit committee as an internal governance mechanism, so the committees are advisory bodies to the board. Despite that, the committees should not replace the functions of the boards, but serve as a support to such body so that, among other tasks, the tendency of contracts with abnormal compensation is reduced.

For Kolev et al. (2019), board support committees are responsible for performing functions related to more specific details such as defining compensation packages, identifying potential members and overseeing reports.

Using a sample of American companies, Hsu (2023) showed that companies with a high-quality compensation committee are more likely to design compensation agreements that limit executives' ability to receive excessive compensation.

Joura et al. (2023) also found that the presence of independent committees, such as the remuneration committee, is considered an effective governance mechanism in reducing abnormal compensation. Van Zyl and Mans-Kemp (2023) also found similar results, indicating that the presence of an independent remuneration committee is relevant to guarantee fair remuneration and, consequently, a reduction in abnormal compensation.

As information transparency increases, there is a greater tendency for shareholder pressures for boards and executives to act in the interests of the principal, increasing the chances of obtaining more effective contracts and compensation. Despite the importance of committees, one should focus on points that converge towards good governance practices, such as the independent composition and diversity of the committees, which makes them more effective in advising the board. Thus, it is suggested that abnormal compensation is negatively influenced by the presence of a governance or risk committee, as well as by the presence of an audit committee.

"H4. The presence of advisory committees to the board is effective in reducing abnormal CEO compensation".

## *CEO duality*

Companies that have the CEO occupying the role of chairman of the board of directors end up delegating two functions related to the company's general decision- making process to a single manager, who then holds power over the other members. The theory of managerial power demonstrates that, when the manager has excessive power within the organization, he/she tends to abuse his/her prerogatives and make decisions that aim at his/her private interests, rather than the owner's interests.

Ali et al. (2022) demonstrated that the separation of powers between the chairman of the board and the CEO is important to ensure transparency and greater independence within decision-making meetings in the organization. The CEO's dual position makes him more powerful, generating greater possibility of managerial opportunism.

Jatana's results (2022) showed that the CEO's duality positively impacts executives' remuneration levels, in line with the theory of managerial power, which addresses duality as a factor that attributes a lot of power to the CEO for occupying the two main functions of the company's decision. Then, it can be considered that CEOs with greater power arising from occupying the positions of chief executive officer and chairman of the board tend to direct the company towards abnormal compensation contracts.

Despite this, in Brazil, Brandão et al. (2019) did not find a statistically significant association when Brazilian companies participating in the Brazil 100 Index were analyzed. Another evidence in the national context was the study by Dutra and Ceretta (2020), which showed that CEO duality is not associated with compensation, not supporting the hypothesis that the separation (or non-separation) of the chairs of chief executive officer and chairman of the board of directors is a governance mechanism (or failure) capable of influencing the determination of compensation.

The results in Brazil are still inconclusive compared to the international literature about CEO duality and effectiveness of compensation contracts, requiring further investigation into CEO duality when it comes to defining compensation packages. These arguments suggest that abnormal compensation is positively influenced by CEO duality.

"H5. The CEO non-duality is effective in reducing the CEO abnormal compensation"

## *CEO tenure*

According to Ziyatkhanli (2022), the CEO's mandate is associated with managerial power, and CEOs with more power may be more prone to opotunistic practices to the detriment of shareholders' interests. In the same line of thinking, Herawaty and Solihah (2019) proved that the CEO's tenure tends to generate opportunistic practices by managers, because it is related to the power of the CEO in influence the allocation of resources.

In a recent study, Darouichi et al. (2021) presented the vision of the CEO's tenure, which can be used as a representative of managerial power characteristic and strengthening of the director within the company. The authors reveal that such power over the internal individuals from the organization can generate, among other factors, expropriation through compensation packages, suggesting the need for better monitoring.

Park et al. (2018) showed that the most powerful CEOs are the ones with the longest tenures. Thus, it is possible to perceive that power tends to influence decisions for individual and not collective attitudes seeking to achieve the interests of the organization, and the literature approaches the CEO tenure as a characteristic that increases managerial power, given that it would be more conducive to carry out actions of their interest during their long period of work in the company without interference from a change of position.

Shorters tenures may be more appropriate, given that CEOs with large tenures are more powerful and tend to act in their personal interest rather than the interests of investors (Darouichi et al., 2021). Thus, the CEO's tenure can be characterized as a form of arrangement that provides power to the company's general manager, considering that the longer the period in which they hold the general decision-making power in the company, the greater their power in front of board members and other company members.

"H6. Reducing CEO power through shorter tenures is effective in reducing abnormal CEO compensation"

## *Relationship between the CEO and the controlling shareholder*

Another factor to be considered is the CEO's close relationships with other members from the organization. From this perspective, the theory of managerial power establishes that relationships among people who set the compensation packages and the remunerated members of such contracts generate social connections, which distance the compensation contracts from meeting the primary interests of the firm (Bebchuk et al., 2002).

Inadequacy of monitoring by boards may also occur (Chung et al., 2015), given that, in a scenario where governance mechanisms are not efficient, there is a tendency for monitoring failures and incentive contracts are formulated ineffectively (Ntim et al., 2019). Despite this, when the CEO is a member of or associated with the family that is the main shareholder, there may also be consistency in the hypothesis of alignment of interests (Ali & Teulon, 2017).

In view of this, relationships between the CEO and the main shareholder may be characteristic of connections between them, which provides greater managerial power and induces compensation contracts designed in a way that does not maximize the others shareholder interest. As the main shareholder has a greater number of directors who are willing to meet his/her objectives, the relationships between the CEO and the main shareholder can lead to greater proximity to the board. Despite this, the main shareholder, through the board that serves him/her, tends to pressure more intensely the CEO for actions in his/her interest.

"H7. The lack of a relationship between the CEO and the main shareholder is effective in reducing the CEO abnormal compensation".

### *Other related factors*

Other factors are also demonstrated as determinants of compensation in previous researches. Salimi (2017) presents results in which long-term compensation arrangements are positively related to corporate sustainability. In view of this, the possibility of efficient hiring arises, where the executive would be remunerated in a way that is more adjusted to his/her competencies, considering that long-term compensation is aimed at aligning interests between managers and owners.

Along the same lines, Ikram et al. (2019) showed that companies link part of their executive compensation to sustainability metrics, in addition to other factors related to the environment and safety. It is a feature that is becoming increasingly evident in large companies. This is consistent with the Stakeholder Theory, which determines that the organization must serve the various stakeholders that are directly or indirectly related to it.

Ntim et al. (2019) used industry dummies and demonstrated an association with abnormal compensation. Other studies also used the companies' sectors of activity as a control variable to analyze the abnormal CEO compensation, such as Gyapong et al. (2020) and Merino et al. (2020).

Park et al. (2023) revealed that corporate social responsibility performance is negatively associated with abnormal or inadequate executive compensation. For the authors, when the company meets social responsibility standards, there is a tendency to reduce abnormal compensation.

In the Brazilian context, it is possible to perceive one of the main indexes that classifies large companies according to their sustainability performance, the Corporate Sustainability Index - ISE. According B3, the ISE is a performance indicator of companies committed to corporate sustainability. The IBGC (2015) also considers the concern with the sphere of sustainability as a good practice to be adopted by public companies. Thus, sustainability measures such as participation in the ISE and the company's sector of activity can be decisive in the existence of more adjusted compensation packages.

## Data and research project

### *Method for determining abnormal compensation*

While previous researches in Brazil analyzed the total compensation of executives (Aguiar & Pimentel, 2017; Anjos et al., 2019; Beuren et al., 2020; Benini et al., 2017; Lopes et al., 2017), our study measures, separately, the unfair part of the compensation, in other words, the part unrepresented by the factors that justify the payment packages to CEOs from companies listed on the stock exchange.

First, to detect CEO abnormal compensation, we performed regressions that use base variables to determine fair compensation, according to Equation (1). The existing models in the literature use variables to determine the estimated compensation and obtain the abnormal compensation by the difference of the estimated values with the amounts paid as compensation (Brick et al., 2006; Core et al., 2008). Thus, we followed the same methodology, adding the adoption of fair compensation factors (Core & Guay, 2010).

In view of this, we used the characteristic factors of ability, effort and performance that justifiably explain the compensation, following the following steps: i) identification of the actual compensation from the natural logarithm of the CEO's total compensation; ii) identification of the expected compensation from regressions that consider the fair factors (ability, effort and performance) as independent variables and the natural logarithm of the CEO's total compensation as a dependent variable; iii) calculation of abnormal, excessive or insufficient compensation by the difference between actual compensation (amount of actual payments to executives) and expected compensation (derived from the regression model that calculates expected compensation).

In Brazil, CEO compensation is not shown by companies separately of the other executives. Despite this, previous studies (Costa et al., 2016; Oliveira et al., 2021; Sprenger et al., 2017) established a metric to determine the calculation of CEO compensation using the compensation of the highest paid executive in the company, also known as maximum compensation, encompassing all types of payments, considering the fixed part (fixed salary, fixed benefits, fixed participations and others) and the variable part (bonus, profit sharing, participation in meetings, commissions, post-employment benefits, termination of employment, share-based and others). Thus, the proxy used was maximum compensation, given the absence of information separately from the CEO and following the methodology already established on CEOs compensation in the Brazilian context (Costa et al., 2016; Oliveira et al., 2021; Sprenger et al., 2017; Sprenger et al., 2020).

Equation 1 was estimated for each industry as definied by B3 itself, using variables representative of ability, effort and performance as exposed by Core and Guay (2010), according to Table 1, following the same methodology and model of previous studies to find abnormal compensation (Brick et al., 2006; Chung et al., 2015; Core et al., 2008).

$$CEO.Pay = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 MB_{it} + \beta_4 B.SEG.\mathrm{Dummy}_{it} + \beta_5 CEO.EXP.\mathrm{Dummy}_{it} + \varepsilon_{it} \tag{1}$$

Table 1
CEO expected compensation regression model

| Dependent variable | | |
|---|---|---|
| Variable | Operationalization | Data source |
| CEO compensation (CEO.Pay) | Natural Logarithm (LN) of the maximum individual compensation. | FR* (item 13.11) |
| Independent variables | | |
| Ability | | |
| Company size (SIZE) | Approximate company size by total assets LN | Economática® |
| CEO experience (CEO.EXP.Dummy) | Dummy variable that assumes “1” if the CEO has already worked as chief executive officer in another company, and “0” otherwise. | FR* (item 12.5/6) |
| Effort | | |
| Business segment (B.SEG.Dummy) | Dummy variable that assumes “1” if the company operates in more than one business segment and “0” otherwise. | FR* (item 7.2 b) |
| Performance | | |
| Return On Assets (ROA) | Return on Assets approximated by the ratio of earnings before interest and taxes to total assets. | Economática® |
| Market-to-Book (MB) | Ratio between the company's market value and shareholders' equity. | Economática® |

Source: own elaboration
* The FR acronym refers to the Reference Form wich is na compulsory form presented by all firms listed in B3

After calculating the expected compensation values for each company, the abnormal compensation value was measured throught Equation 2.

$$\text{Abnormal compensation} = \text{Actual compensation} - \text{Expected compensation} \tag{2}$$

Since abnormal compensation can result in values both higher and lower than expected, we divided the sample between those who received abnormal compensation above the expected (overpayment) and those who received abnormal compensation below the expected (underpayment).

This separation is based on the fact that both positive abnormal compensation can represent an environment that is more conducive to motivation or exorbitant amounts as a form of expropriation of shareholders, and negative abnormal compensation can represent an environment that does not adequately motivate executives (Brick et al., 2006), justifying the use of these measures. Thus, the three measures of compensation were obtained, considered here as dependent variables: Abnormal compensation, Overpayment and Underpayment.

It is possible to notice that low values of abnormal compensation, whether positive or negative, may not have representation in the analyses, suggesting that such values should not be considered as abnormal. This means that CEOs who receive compensation slightly higher than expected compensation can be considered normally compensated rather than overpaid. Likewise, executives and CEOs who are compensated slightly less than expected compensation may also be considered normally compensated rather than insufficiently compensated.

Therefore, the measure of executive and CEO remuneration was splited according to Dah and Frye (2017), into subcategories, through a confidence interval using values below the 95th percentile (Underpayment), above the 5th percentile (Overpayment) and values of negative abnormal compensation above the 95th percentile and positive abnormal compensation below the 5th percentile (normal compensation, i.e. not Overpayment and not Underpayment).

## Data and sample

The collection of data about financial information was performed using information from the Economática® database, which presents data from companies on important stock exchanges in the world, including the Brazilian stock exchange, (Brasil, Bolsa, Balcão - B3). Economática® had a total of 375 companies in Brazil during the research period , year 2021. On the other hand, the Reference Forms (FR) were obtained from the Brazilian Exchange Comission (CVM) website and when not found a search was carried out on the B3 website. All data collected refer to annual information since the FR with compensation packages are published at this frequency. We present the description of the samples used in Table 2, using data for the years 2011-2020.

The sample was defined based on the selection of companies from the Brazilian stock exchange, B3, which in the period had 375 companies, of which 54 were excluded because they were in the financial sector, 83 were excluded due to lack of data necessary to calculate the variables and 36 were excluded for not disclosing data on maximum remuneration, a metric used to remunerate the CEO (the company's highest-paid executive), resulting in a total of 200 companies.

Of these companies, 11 presented normal compensation, considering the confidence interval used, according to Dah and Frye (2017), resulting in a final sample of 189 companies for a general analysis of abnormal compensation. Of this total, 114 companies presented overpayment and 75 companies presented undepayment, characterizing the final sample of the research for the three groups analyzed, all through an unbalanced panel over the 10 years of the study.

Table 2
Description of study samples

| Basis of determination | Analysis | No. companies in the sample | No. observations in the sample |
|---|---|---|---|
| CEO compensation | Abnormal compensation | 189 | 1,530 |
| | Overpayment | 114 | 810 |
| | Underpayment | 75 | 720 |

Source: own elaboration

## Empirical method

The equations 3 to 5 were analyzed using panel data using RStudio software and are presented in a way that demonstrates that each one uses a dependent variable, either Abnormal Compensation, Overpayment and Underpayment of the CEO. Thus, equations 3, 4 and 5 are described:

$$\text{Model I: CEO.AB.Pay} = \beta_0 + \beta_1\text{CONS.SIZE}_{it} + \beta_2\text{GENDER.CONS}_{it} + \beta_3\text{IND.CONS}_{it} + \beta_4\text{GOV.COM.Dummy}_{it} + \beta_5\text{AUDIT.GOV.Dummy}_{it} + \beta_6\text{CEODUAL.Dummy}_{it} + \beta_7\text{CEO.TENURE}_{it} + \beta_8\text{CEO.CONTR.Dummy}_{it} + \beta_9\text{ISE.Dummy}_{it} + \beta_{10}\text{INDS.Dummy}_{it} + \varepsilon_{it} \quad (3)$$

$$\text{Model II: CEO.Overpay} = \beta_0 + \beta_1\text{CONS.SIZE}_{it} + \beta_2\text{GENDER.CONS}_{it} + \beta_3\text{IND.CONS}_{it} + \beta_4\text{GOV.COM.Dummy}_{it} + \beta_5\text{AUDIT.GOV.Dummy}_{it} + \beta_6\text{CEODUAL.Dummy}_{it} + \beta_7\text{CEO.TENURE}_{it} + \beta_8\text{CEO.CONTR.Dummy}_{it} + \beta_9\text{ISE.Dummy}_{it} + \beta_{10}\text{INDS.Dummy}_{it} + \varepsilon_{it} \quad (4)$$

$$\text{Model III: CEO.Underpay} = \beta_0 + \beta_1\text{CONS.SIZE}_{it} + \beta_2\text{GENDER.CONS}_{it} + \beta_3\text{IND.CONS}_{it} + \beta_4\text{GOV.COM.Dummy}_{it} + \beta_5\text{AUDIT.GOV.Dummy}_{it} + \beta_6\text{CEODUAL.Dummy}_{it} + \beta_7\text{CEO.TENURE}_{it} + \beta_8\text{CEO.CONTR.Dummy}_{it} + \beta_9\text{ISE.Dummy}_{it} + \beta_{10}\text{INDS.Dummy}_{it} + \varepsilon_{it} \quad (5)$$

Where, CEO.AB.Pay is the Abnormal CEO Compensation, including the Overpayment and Underpayment module; CEO.Overpay is the Positive Abnormal CEO Compensation (Overpayment), and CEO.Underpay is the Negative Abnormal CEO Compensation (Underpayment).

Table 3 presents a summary of the independent and control variables of the models for the analysis of abnormal compensation, since the dependent variables have already been presented.

Table 3
Model variables for analysis of Abnormal Compensation

| Independent variables | | | |
|---|---|---|---|
| Variable | Operationalization | Data source | Signal expected |
| Corporate Governance variables | | | |
| Board size (CONS.SIZE) | Number of effective members of the board *chairman of the board considered a effective member. | FR (item 12.5/6) | + |
| Gender diversity on the board of directors (GENDER.CONS) | Proportion of effective members of the board who are women. | FR (item 12.5/6) | - |
| External Board Proportion of effective members of the board of FR Members (IND.CONS) | Proportion of effective members of the board who declared that they only belong to this board. | FR (item 12.5/6) | - |
| Governance committee (GOV.COM.Dummy) | "1" in case of existence of a governance committee and, otherwise, "0". | FR (item 12.7/8) | - |
| Audit committee (AUDIT.GOV.Dummy) | "1" in case of existence of an audit committee and, otherwise, "0". | FR (item 12.7/8) | - |
| Managerial power variables | | | |
| CEO Duality (CEODUAL.Dummy) | "1" if the CEO also holds the chair of the board and, otherwise, "0". | FR (item 12.5/6) | + |
| CEO tenure (CEO.TENURE) | CEO tenure in years. | FR (item 12.5/6) | + |
| CEO´s relationship with the controlling shareholder (CEO.CONTR.Dummy) | "1" if the CEO has a relationship with the main shareholder (be nominated by him) and 0, otherwise. | FR (item 12.5/6) | + |
| Control Variables | | | |
| Variable | Operationalization | Data source | Signal expected |
| Listed in the Index of Corporate Sustainability (ISE.Dummy) | "1" if the company participates is listed in the ISE and "0" otherwise. | B3 | - |
| Industry in which the company operates (INDS.Dummy) | "1" if the company operates in the referred industry, "0" otherwise (Industrial Goods - sector considered dummy reference)<br><br>Economática®<br><br>+/- reference) | Economática® | +/- |

Source: own elaboration

Tests were carried out to verify the most suitable model for data analysis, with the Chow F test, the Lagrange multiplier test and the Hausman test, as shown in Table 4. It was found that, for models I and II, the random effects panel proved to be more suitable. For model III, the pooled model was more suitable.

It was also tested the presence of multicollinearity through the Variance Inflation Factor (VIF), and no problem was detected between the variables, since the VIF values were all below 10. The models use the White robust standard error to eliminate possible heteroscedasticity problems, resulting in in robust models and allowing greater security in the analyses (Fávero & Belfiore, 2017), considering the significance of the associations.

The residual independence test was also performed. The Breusch-Godfrey test for residual independence presented significance of 0.7694, 0.1501 and 0.7251 for the Model I, Model II and Model III, respectively, supporting the rejection of the alternative hypothesis and indicating that there is no violation of the residual independence assumption in any of the models, which reinforces the robustness of the results presented in all models.

## Results and discussions

### *Multivariate regression analysis*

As a result, it was noticed that all models (I, II and III) are significant at the 1% level, given the F tests presented in Table 4. We inform that model I used a sample of 189 companies over the 10 years of the research, generating 1,530 observations, while models II and III used 114 and 75 companies, with 810 and 720 observations throughout the research, respectively.

Table 4
Models for abnormal CEO compensation, overpayment and underpayment

| Independent variable/ Control variable | Models – Abnormal CEO Compensation | | | | |
|---|---|---|---|---|---|
| | Model ( I ) Abnormal Compensation | | Model ( II ) Overpayment | | Model ( III ) Underpayment |
| CONS.SIZE | 0.0583 | *** | 0.1072 | *** | -0.0167 |
| (VIF) | (1.45) | | (1.39) | | (1.52) |
| GENDER.CONS | -0.1867 | *** | -0.1889 | | -0.1371 |
| (VIF) | (1.05) | | (1.04) | | (1.10) |
| IND.CONS | -0.4080 | ** | -0.2482 | | -0.3296 |
| (VIF) | (1.36) | | (1.22) | | (1.49) |
| GOV.COM.Dummy | 0.0969 | * | 0.0515 | | 0.0037 |
| (VIF) | (1.40) | | (1.34) | | (1.38) |

| | | | | | | |
|---|---|---|---|---|---|---|
| AUDIT.GOV.Dummy | 0.3259 | *** | 0.3328 | *** | 0.1258 | |
| (VIF) | (1.33) | | (1.20) | | (1.41) | |
| CEODUAL.Dummy | -0.0120 | | 0.0728 | | 0.0185 | |
| (VIF) | (1.27) | | (1.19) | | (1.33) | |
| CEO.TENURE | 0.1063 | ** | 0.1327 | *** | 0.0310 | |
| (VIF) | (1.05) | | (1.06) | | (1.05) | |
| CEO.CONTR.Dummy | -0.2053 | *** | -0.2575 | *** | 0.0721 | |
| (VIF) | (1.13) | | (1.16) | | (1.18) | |
| ISE.Dummy | 0.1238 | | 0.2324 | ** | -0.1898 | |
| (VIF) | (1.20) | | (1.22) | | (1.22) | |
| INDS.Dummy | Sim | *** | Sim | *** | Sim | *** |
| (VIF) | (1.70) | | (1.73) | | (2.10) | |
| (Constant) | 13.9908 | *** | 13.7697 | *** | 14.0579 | *** |
| (VIF) | ( - ) | | ( - ) | | ( - ) | |
| F Test | 0.0000 | | 0.0000 | | 0.0001 | |
| R² adjusted | 0.1878 | | 0.3796 | | 0.0752 | |
| R² | 0.1973 | | 0.3829 | | 0.0983 | |
| No. of observations | 1,530 | | 810 | | 720 | |
| Chow Test | Sig. 0.0000 | | Sig. 0.0000 | | Sig. 0.9078 | |
| Lagrange Test | Sig. 0.0000 | | Sig. 0.0000 | | Sig. 0.9086 | |
| Hausman Test | Sig. 0.5557 | | Sig. 0.8543 | | ( - ) | |

Notes: For Model (I), the dependent variable was CEO.AB.Pay. For Model (II), the dependent variable was CEO.Overpay. For Model (III), the dependent variable was CEO.Underpay.
Significance level: 1% ** 5% * 10%

Source: own elaboration

We showed that larger boards induce less adjusted compensation contracts, through abnormal compensation and overpayment, but do not influence compensation packages with underpayment. The result supports hypothesis H1 by demonstrating the effectiveness of smaller boards in reducing abnormal CEO compensation. When observed the baseline literature, Jensen (1993) stated that large boards weaken the governance structure because a large number of decision-making board members tend to afect board monitoring. This is clearly seen in the present study, where companies with very numerous boards tend to present less effective compensation packages and executives are compensated in amounts greater than what would be deserved for their effort, ability and performance.

This result corroborates the thinking of Lo and Wu (2016), who state that boards with fewer members are considered better in terms of monitoring executives, being more effective in barring compensation contracts that are not aligned to the shareholders´ interests. In contrast, the result is different from Ali and Teulon (2017), who found a negative association between large boards and compensation, stating that, in the context studied, CEOs are not able to control large board decisions to obtain higher compensation values.

The findings can demonstrate the importance of limiting large boards which, as Rashid (2020) states, is one of the most widely studied governance characteristics. Core et al. (1999) also follow the same line, suggesting the adoption of smaller boards to characterize good governance and, consequently, achieve effectiveness in defining compensation contracts. Similarly, Ali and Teulon (2017) showed a significant association between board size and compensation packages. As pointed out, smaller boards end up being more cohesive in decisions and can be useful in implementing more effective compensation packages (Core et al., 1999), as can be seen by the results with the reduction of abnormal compensation.

We demonstrate that the proportion of women on the board of directors induces fairer compensation contracts, but only when we analyze abnormal compensation, since the result is not repeated when observing overpayment and underpayment, providing support for hypothesis H2 for abnormal compensation. As women are more risk averse, with their presence on the board associated with lower agency costs (Ain et al., 2020), female participation on boards of directors is capable of representing a governance mechanism that contributes to the reduction abnormal compensation, but only observing the compensation contracts paid individually to the CEO. Therefore, the findings are consistent with Sarhan (2018) and Ullah et al. (2019), who consider gender diversity as an important corporate governance mechanism.

Our result supports hypothesis H3 by presenting a negative relationship between board independence and abnormal compensation. From our results, it is possible to affirm that more independent boards, formed by external directors, are more effective in reducing contracts of abnormal compensation. However, we were only able to point out this result for the analysis of abnormal compensation that considers the general part, given that we did not find a statistically significant association between board independence and overpayment or underpayment separately.

The results about the negative association of the variable that represents the proportion of external directors with the abnormal compensation are consistent with those of Bebchuk et al. (2002) who demonstrated that external directors are more effective in monitoring of the CEO's actions and performance. In this way, when the proportion of external members increases, there is an improvement in the monitoring of the CEO (Bebchuk et al., 2002), increasing the effectiveness of CEO compensation contracts. Our result translates into indications of managerial power, when the relationship between CEO and others directors is friendly. As directors are responsible for defining the compensation packages, it is possible that they serve the CEO's interests because of the relationship between them.

Our results are similiars to the Park et al. (2018), indicating that the number of external directors provides more effectiveness in monitoring, as stated by Bebchuk et al. (2002), due to the improvement in the supervision of the CEO, as well as, due to the fulfillment of shareholders' interests by the independent boards.

Regarding the advisory committees to the board, we noticed that the presence of a governance, risk or financial committee does not influence the determination of abnormal compensation, considering the significance of 5%. Despite this, we can say that the presence of the governance committee leads to less adjusted compensation contracts at the 10% level.

The presence of an audit committee, on the other hand, showed a positive and significant association with abnormal compensation. This means that the existence of an audit committee in the organization is not considered a governance mechanism capable of reducing opportunistic practices with abnormal compensation. We do not confirm hypothesis H4 that states that advisory committees are effective in obtaining more adjusted compensation packages. The result is in agreement with the previous literature, which presents advisory committees regarded as good corporate governance practices (Al-Ahdal et al., 2020; Barros et al., 2019). Kolev et al. (2019) argues that committees should have members considered independent in their composition so that they are more effective in advising, and attention is deserved so that advisory committees have an independent composition of the internal members of the organization.

We were also unable to support hypothesis H5 about how effective CEO non-duality is in reducing abnormal compensation, as we did not find any statistically significant association. As the separation of the positions of chairman of the board and chief executive officer (CEO non- duality) is used as a governance practice to reduce CEO power, it was expected that companies in which the CEO also occupied the chair of the chairman of the board had higher abnormal compensation, which characterizes the ineffectiveness of compensation contracts.

However, the reality of Brazil is different from that of developed countries, which presented researches with a significant relationship regarding CEO duality, Brazilian studies showed that, unlike international research, there is no significant relationship between compensation and CEO duality (Dutra & Ceretta 2020; Cunha et al., 2016; Brandão et al., 2019). The same occurs when the share-based compensation is analyzed separately (Ermel & Medeiros, 2020).

Executives face strong pressure to justify their compensation (Li et al., 2019) and, in Brazil, most companies are characterized by having family ownership, that is, there is a group of family members who control decisions to be made in the organization (Bressan et al., 2019), either through their roles as managers or through their appointed directors. From this perspective, the company tend to be more closely supervised by the main shareholder group itself when it is owned by a family. Thus, despite the CEO having greater power because he is the main manager of the company and chairman of the board, in Brazil it is perceived that the CEO has his/her power attenuated by the supervision of the main shareholder, in addition to being subordinated to his/her appointment, making it more likely that do not abuse his/her managerial power, as is the case in other countries where the CEO duality is a determining factor in abnormal compensation.

We found that CEO tenure is positively associated with abnormal compensation and overpayment. This suggests acceptance of hypothesis H6 regarding managerial power emanating from the CEO's tenure. The results corroborate the Herawaty and Solihah (2019) research which demonstrated that the CEO's tenure generates opportunistic practices. This suggests that the CEO, with a greater level of power due to his/her greater stability in the tenure, tends to influence the elaboration of his/her own compensation packages.

Darouichi et al. (2021) demonstrated that a shorter CEO tenure is more appropriate to reduce their managerial power, because, when they hold a higher level of power, CEOs tend to act in their own interest, not meeting the shareholders' objectives. This result demonstrates the CEO power approach. As the CEO can act opportunistically, he/she tends to use his/her power influencing the definition of his/her own compensation packages, but obviously has no interest in influencing the reduction of compensation packages to insufficient levels, given the absence of association with underpayment.

The relationship between the controlling shareholder and the CEO was shown to be negatively associated with abnormal compensation and overpayment. Such associations show that, in companies in which the CEO has a relationship with the company's main shareholder, there is a tendency for low abnormal compensation. With this, we can not accepet H7, which demonstrated the connection between the CEO and controlling shareholder as influential in abnormal compensation packages.

Thus, the view of Moriarty's (2005) arrangement is not characterized, which defines that there would only be fair payment in the situation in which the CEO is not close to the definers of the compensation package. On the contrary, the result points to the relationship between the CEO and the controlling shareholder, who appoints the majority of directors and requires directors to represent their interests in the board's decisions. Thus, even with the close relationship between CEO and controlling shareholder, there is no evidence of income extraction by the CEO, not characterizing divergence, but alignment ofinterests.

The results are different from the hypothesis of managerial power regarding the proximity of the CEO to the controlling shareholder, since, according to Bebchuk et al. (2002), the existence of social connections generates a situation of proximity between the controlling shareholder and the CEO. However, our result can be considered as consistent with the turnover view, where the CEO may fear his/her turnover by not meeting the interests of the principal (Kesner and Dalton, 1994), also having incentives to act in accordance with the organization's objectives, to demonstrate abilities and expect to retain the position.

According to our results, we suggest the hypothesis of alignment of interests, since the connections between the CEO and the controlling shareholder ended up generating pressure for existence of more adjusted compensation packages, just like Ali and Teulon (2017). As the CEO is a member appointed by the controlling shareholder, it is possible that his/her actions are taken with the intention of serving the interests of the company and not his/her own interests.

We also evidenced that companies participating in the ISE tend to present excessive compensation through CEO overpayment. The result is contrary to the indication of the IBGC (2015) which demonstrates the concern with corporate sustainability issues as a good practice for aligning interests. However, it should be noted that participation in corporate sustainability indexes confers a label of environmental and social performance in the market, which can generate greater trust, but is not effective in obtaining more adjusted compensation contracts.

The industry also proved to be significant. So it is possible to affirm that some industries present a positive and significant relationship, with abnormal compensation, such as communications, cyclical consumption, non-cyclical consumption and basic materials. Despite this, the public utility industry showed a negative and significant association with abnormal compensation.

Table 4
Hypotheses sumary

| Hypothese | Result | Theoretical Support |
|---|---|---|
| H1. Board size is effective in reducing CEO abnormal compensation | Confirmed | Smaller boards are more effective in monitoring and, consequently, are less likely to result in abnormal remuneration, overpayment, a result similar to Lo and Wu (2016) and Rashid (2020). |
| H2. Gender diversity on the board is effective in reducing CEO abnormal compensation | Confirmed | Female participation on boards contributes to the reduction of abnormal compensation, consistent with results from Sarhan (2018) and Ullah et al. (2019). |
| H3. Board independence is effective in reducing CEO abnormal compensation | Confirmed | Independent boards, made up of external advisors, are more effective in reducing abnormal compensation contracts, similar to the results of Park et al. (2018). |
| H4. The presence of advisory committees to the board is effective in reducing CEO abnormal compensation | Rejected | According to our data, we cannot state that advisory committees are effective in obtaining more adjusted compensation packages. |

| | | |
|---|---|---|
| H5. The CEO non-duality is effective in reducing the CEO abnormal compensation | Rejected | According to our data, we cannot state that CEO non-duality can be described as effective in reducing abnormal compensation. |
| H6. Reducing CEO power through shorter tenures is effective in reducing CEO abnormal compensation | Confirmed | CEO tenure is positively associated with abnormal compensation and overpayment. Our results suggest that reducing CEO power can be useful in reducing abnormal compensation, especially overpayment, corroborating Herawaty and Solihah (2019) and Darouichi et al. (2021). |
| H7. The lack of a relationship between the CEO and the majoritary shareholder is effective in reducing the CEO abnormal compensation | Rejected | According to our data, we cannot confirm hypothesis 7, since in companies where the CEO has a relationship with the company's controlling shareholder, there is a tendency to have low abnormal compensation. |

Source: own elaboration

## Conclusions

Based on the results presented, we conclude that abnormal compensation and overpayment are mitigated by governance mechanisms such as board size reduction, board diversity and board independence. Our findings also allow us to conclude that strategies that reduce managerial power can be useful for reducing abnormal compensation and overpayment. For example, we suggest that CEOs be elected with a shorter tenure to reduce the abuse of power and, consequently, reduce their propensity to opportunistic practices such as extracting income through abnormal compensation. With this, we can not reject the hypotheses H1, H2, H3 and H6.

However, when we analyzed CEO underpayment, we identified different results. Our findings demonstrate that the governance mechanisms presented here, as well as practices to reduce CEO power, do not influence under-compensation. This means that such mechanisms and practices are not effective in reducing underpayment. Such results allow us to consider that CEOs, when poorly monitored and endowed with excessive power, tend to exercise their opportunistic practices, influencing the determination of their compensation packages for unjustified receipts. However, they do not use governance failures or their excessive power to influence the reduction of their compensation packages, since no associations with underpayment were identified, which is logically expected.

We were also unable to prove that governance practices, such as the existence of a governance committee and an audit committee, are effective in obtaining more adjusted compensation contracts, with fewer abnormal compensation. This was noticed when hypotheses H4 and H5 were rejected. Likewise, we can not accept hypothesis H7, given that the connections between the CEO and the controlling shareholder was not seen as a practice that increases the abnormal compensation due to its proximity to the controlling shareholder. On the contrary, the results led us to conclude that the CEO may fear his turnover by not meeting the interests of the principal, consistent with the hypothesis of alignment of interests.

Our results contribute to the existing literature on CEO compensation, as we demonstrated that governance mechanisms and reduction of managerial power can be used by companies to obtain more adjusted and less excessive compensation packages. Our conclusion is useful in suggesting that companies reduce abnormal compensation through smaller, gender-diverse, independent boards and shorter CEO tenures. We also contributed by demonstrating that such practices are not useful in determining insufficient compensation.

Despite this, the study contains limitations given its form, data availability and other factors. It was not possible to make a comparison between the Brazilian market and other countries. The Generalized Method of Moments - GMM model was also not used for dynamic estimation. Therefore, it is recommended for future research that comparisons be made between institutional contexts in different countries, in addition to estimation using the GMM model.

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