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BOARD OF DIRECTORS, GENDER DIVERSITY AND MONITORING

Conselho de administração, diversidade de gênero e monitoramento

Consejo de administración, diversidad de género y monitoreo

Camila de Araújo Fernandes[1] | xx.kmylla@gmail.com | ORCID: 0000-0002-5148-4549

Márcio André Veras Machado*[2] | mavmachado@hotmail.com | ORCID: 0000-0003-2635-5240

*Corresponding author

[1]Universidade Federal da Paraíba, Programa de Pós-Graduação em Administração, João Pessoa, PB, Brazil

[2]Universidade Federal da Paraíba, Programa de Pós-Graduação em Administração e em Contabilidade, João Pessoa, PB, Brazil

ABSTRACT

This paper aimed to investigate whether gender diversity in the board affects the effectiveness of monitoring in order to reduce the total and variable remuneration of executives, the practice of earnings management, and the sensitivity of CEO turnover to the performance of Brazilian companies. We analyzed 199 companies listed on B3 between 2011 and 2018. The results indicate that gender diversity on the board has a negative effect on the total and variable remuneration of executives, and the participation of 11% to 20% of women on the board has a negative effect on earnings management. Although it has no direct effect on the probability of CEO turnover, gender diversity takes away the explanatory power of the ROA. We understand that gender diversity on the board of directors improves the effectiveness of the monitoring functions investigated, although this is an overdue effect when other governance proxies are considered.

Keywords: gender diversity, board of directors, remuneration of executives, gender diversity, CEO turnover.

RESUMO

Este artigo teve por objetivo investigar se a diversidade de gênero no conselho afeta a eficácia do monitoramento, no sentido de reduzir a remuneração total e variável dos executivos, a prática de gerenciamento de resultados e a sensibilidade do turnover do CEO ao desempenho das empresas brasileiras. Foram analisadas 199 empresas listadas na B3 entre 2011 e 2018. Os resultados indicam que a diversidade de gênero no conselho tem efeito negativo sobre a remuneração total e variável dos executivos e sobre o gerenciamento de resultados, neste caso quando considerada a participação de 11% a 20%. Apesar de não ter efeito direto sobre a probabilidade de turnover do CEO, a diversidade de gênero tira o poder explicativo do ROA sobre essa probabilidade. Entende-se que a presença de mulheres no conselho melhora a eficácia das funções de monitoramento, embora esse efeito seja sobrepujado quando consideradas outras proxies de governança.

Palavras-chave: *diversidade de gênero, conselho de administração, remuneração dos executivos, gerenciamento de resultados, turnover do CEO.*

RESUMEN

Este artículo tuvo como objetivo investigar si la diversidad de género en el consejo de administración afecta la efectividad del monitoreo, en términos de reducir la remuneración total y variable de los ejecutivos, la práctica de la gestión de resultados y la sensibilidad de rotación del CEO al desempeño de las empresas brasileñas. Se analizaron 199 empresas listadas en B3 entre 2011 y 2018. Los resultados indican que la diversidad de género en el consejo tiene un efecto negativo en la remuneración total y variable de los ejecutivos y la participación del 11% al 20% de mujeres en el consejo tiene un efecto negativo en la gestión de los resultados. Aunque no tiene un efecto directo en la probabilidad de rotación del CEO, la diversidad de género le quita poder explicativo al ROA. Se entiende que la diversidad de género mejora la eficacia de las funciones de monitoreo, aunque este efecto se ve compensado cuando se consideran otras proxies de gobernanza.

Palabras clave: *diversidad de género, consejo de administración, remuneración de los ejecutivos, gestión de resultados, rotación del CEO.*

INTRODUCTION

Diversity on the board of directors has received increased global attention in recent years since diverse boards are expected to benefit from diverse perspectives and perform their roles better (Baker *et al.*, 2020). This is one of the major challenges that companies must face in the 21st century (Silveira & Donaggio, 2020). In the corporate scenario, some companies have been making efforts to increase the participation of women in top management positions. For example, XP Inc. announced its public commitment to including women in the financial market and leadership positions (Sutto, 2020). The *Cartica Management*, a high-performance fund, is managed by women and has been encouraging companies to appoint women to the board (Bloomberg Brazil, 2020).

Gender diversity on the board has been noted as a moderator for reducing the frequency of fraud, making the stock market's reaction to defrauding less pronounced (Cumming *et al.*, 2015). Furthermore, it provides for better decisions in mergers and acquisitions (Levi *et al.*, 2014). Gul et al. (2011) further suggest that gender diversity on the board improves the informativeness of stock prices, with its effect being stronger when governance is weak.

Moreover, Adams and Ferreira (2009) suggest gender diversity effects are conditioned on the strength of corporate governance, having a negative effect on performance when governance is strong and a positive effect when governance is weak. Therefore, the level of governance is a relevant factor in the effects of women on the board. Moreover, there may be different results in research focused on developed economies and emerging markets with low corporate governance and investor protection, such as Brazil.

In the Brazilian context, since 2014, the Brazilian Institute of Corporate Governance (IBGC) has implemented the Diversity on Board Program to promote gender diversity on boards. Bill 7179/17, which provides for a minimum of 30% female participation in boards of directors with a majority of state-controlled social capital, is also under analysis. Under this perspective, the possibility of imposing quotas leads to questioning women's performance as board members, considering the assumed roles.

According to Kirsch (2018), journals have published about gender diversity on the board since the 1980s. However, approximately one-third of the studies focus on its association with performance and have inconclusive results. Furthermore, the evidence focuses on developed economies (Bugeja *et al.*, 2015; Harakeh et al., 2019; Zalata *et al.*, 2019), many of which have practices in place to encourage women to participate in the board. In such a context, evidence has been limited on the effects of gender diversity on other aspects, such as the effectiveness of board monitoring functions.

On the national scenario, evidence around gender diversity is still scarce and focused on the impact of gender diversity on performance (Costa *et al.*, 2019; Dani *et al.*, 2019; Silva & Margem, 2015), capital structure (Nisiyama & Nakamura, 2018), and corporate social responsibility (Prudêncio *et al.*, 2021, Silveira & Donaggio, 2020). In the international context, we can point to evidence that gender diversity on the board is associated with lower levels of executive compensation

(García-Izquierdo *et al.*, 2018; Harakeh *et al.*, 2019; Usman *et al.*, 2018), higher levels of informational quality of accounting aggregates (Azeez *et al.*, 2019; Saona *et al.*, 2019), and lower sensitivity of CEO replacement conditioned to performance (Kim *et al.*, 2020).

However, little is known about these effects when considering the configuration of capital markets characterized by low corporate governance and weak investor protection mechanisms, such as Brazil. This study focuses on collecting evidence regarding the effects of gender diversity on the monitoring function performed by the board of directors. It uses remuneration, audit, and CEO appointment as the main monitoring functions (Faleye *et al.*, 2011; Li & Wahid, 2018), which will be explored using variable and total executive compensation as *proxies*, the quality of financial information based on the earnings management practice, and the sensitivity of CEO *turnover* to firm performance, respectively.

Gender diversity on the board is believed to be related to more effective monitoring levels, especially in the Brazilian context of low governance, higher risk and macroeconomic uncertainty, and ownership concentration, which may serve as a support mechanism for internal control. In this direction, this study investigates whether gender diversity on the board impacts the monitoring effectiveness in reducing total and variable executive compensation, the earnings management practice, and the sensitivity of CEO *turnover* to the performance of Brazilian publicly traded companies.

In this context, studies aimed at elucidating the impact of gender diversity on boards are important. Therefore, this study focuses not on ownership structure or performance (Costa *et al.*, 2019; Dani *et al.*, 2019; Nisiyama & Nakamura, 2018; Silva & Margem, 2015), nor on corporate social responsibility (Prudêncio *et al.*, 2021; Silveira & Donaggio, 2020), but rather on the contributions of female directors' participation in monitoring roles, based on the premise that it is not perfectly feasible to directly analyze the effect of board diversity on performance, given several observable and unobservable elements.

This study also differs from others (Azeez *et al.*, 2019; García-Izquierdo *et al.*, 2018; Harakeh *et al.*, 2019; Kim *et al.*, 2020; Saona *et al.*, 2019; Usman *et al.*, 2018), in addressing monitoring from a multidimensional perspective of the board's functions, with the understanding that the efficiency of the monitoring performed can be observed based on its most relevant functions. Furthermore, it considers endogeneity problems intrinsic to governance analysis, aspects not observed in García-Izquierdo et al. (2018) and Pavlović *et al.* (2018).

Thus, motivated by recent findings (Adams & Ferreira, 2009; Al-Shaer & Harakeh, 2020; Saona *et al.*, 2019; Kim *et al.*, 2020) and considering the global scenario of low female representation in strategic positions (World Economic Forum, 2020), this study sought to expand the knowledge regarding the effect of diversity on the board in emerging economies, contributing to the definition of more effective monitoring mechanisms and the debate on women's insertion in strategic positions in companies by emphasizing their role in corporate governance and agency conflicts.

The results also serve as an auxiliary tool in critically understanding the consequences of women's insertion into top management positions not only because of legal and some *stakeholders*' pressure but also because of the evidence of women's effect on the monitoring function of boards.

Moreover, based on these results, companies can make better-informed decisions concerning the appointment of board directors.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

This study is based on the agency and resource dependence theories, which are complementary to understanding how directors act in corporate governance. The first theory predicts that both parties maximize their utility in the agency relationship. There will be conflicts of interest to be limited based on appropriate monitoring and incentives for the agent, which implies agency costs (Jensen & Meckling, 1976). The second admits that part of the board's efficiency is associated with the amount and nature of information available to its members. Bringing together a diverse group of individuals leads to access to a broader set of information and skills (Azeez *et al.*, 2019).

Thus, based on these theories, a diverse board should be more effective in monitoring and more likely to make decisions, aiming to generate wealth and better results for the company in the long term. Furthermore, heterogeneity in the company's top management can lead to a broader vision, a better understanding of the environment's complexity, and better decisions (Carter *et al.*, 2003), along with several positive impacts, such as better corporate social responsibility indicators; better ethical and social reputation; greater compliance with laws and regulations; and better quality of the reports disclosed by the companies (Silveira & Donaggio, 2020).

Campbell and Mínguez-Vera (2008) support these arguments. They suggest that diversity leads to different ideas, experiences, skills, and ethical behavior that improve board effectiveness and the firm's reputation and legitimacy toward *stakeholders*. Moreover, Zalata *et al.* (2019) suggest that women possess both *soft skills*, such as benevolence, caring, friendliness, and congeniality, and *hard skills*, such as altruism, conservatism, independence, objectivity, responsibility, and risk aversion, which make them better than men in monitoring roles. This study considers the main monitoring functions to be compensation, audit, and CEO appointment (Faleye *et al.*, 2011; Li & Wahid, 2018).

Executive compensation is a high-impact decision in risk-taking. An inadequate *mix* of compensation can alter managers' attitudes toward risk, misaligning interests between principal and agent. In order to reduce the problem, companies tend to adopt a portion of variable compensation, incorporating performance-based elements (García-Izquierdo *et al.*, 2018).

Studies suggest a negative effect of gender diversity on the board of directors and/or the compensation committee on CEO compensation, concluding that there is a lower level of compensation when women also participate in these bodies (García-Izquierdo *et al.*, 2018; Harakeh, El-Gammal, & Matar, 2019; Usman *et al.*, 2018). There is also evidence that firms with an all-male compensation committee and excessive CEO compensation have lower returns on assets in the subsequent period, a fact not observed in firms with a gender-diverse committee, and that women on the board can be valuable resources for executive compensation planning and design that think about the sustainable development of the firm and contribute to corporate governance

(Bugeja *et al.*, 2015; Pucheta-Martínez *et al.*, 2017). Al-Shaer and Harakeh (2020) corroborated this argument. They concluded that firms with at least one woman on the board have lower executive compensation than those with exclusively male board members.

In observance not only of the theory, which predicts the possible definition of more appropriate compensation based on the presence of women on the board, but also of the empirical evidence presented, it is believed that, in the Brazilian context of low corporate governance and high ownership concentration structure, female participation reduces the total compensation of executives. Thus, the first research hypothesis is established:

H1: gender diversity on the board has a negative effect on total executive compensation.

While international evidence points to a possible negative effect of board gender diversity on total executive compensation, the impact on variable compensation is unclear, given the inconsistency in the results. Studies such as those by Baixauli-Soler *et al.* (2016) and Almor et al. (2019) suggest a positive relationship between gender diversity on the board and variable executive compensation. On the other hand, there is also evidence that gender diversity on the board would be associated with greater compensation sensitivity to firm performance (Sarhan *et al.*, 2019) and would have a negative effect on the variable compensation of the CEO (Harakeh *et al.*, 2019) and the executive board (Al-Shaer & Harakeh, 2020). Thus, this study builds on the premise that there is a negative effect of gender diversity on the board regarding variable executive compensation since gender diversity reduces the excess compensation of the company's executive staff, thus culminating in the second research hypothesis:

H2: gender diversity on the board has a negative effect on variable executive compensation.

Given the inherent lack of synchronization of earnings with cash flows, the most common way of misreporting financial information is through earnings management. The earnings management practice based on the use of *discretionary accruals* can be seen as a *proxy* for the quality of financial information disclosed by firms.

Studies such as those by Saona *et al.* (2019) and Azeez *et al.* (2019) suggest that women's participation on the board reduces companies' earnings management practices, demonstrating that women are supervisors who positively impact the effectiveness of board monitoring in light of reducing this form of managerial opportunism.

Considering the above, there is evidence that promoting gender diversity on the board is a corporate governance mechanism that reduces profit manipulation and provides higher-quality financial information for stakeholders. Thus, we have the third research hypothesis:

H3: gender diversity on the board has a negative effect on earnings management.

The CEO's retention at a time of poor firm performance can be seen as a long-term board orientation that improves the effectiveness of monitoring and *advising* (Kim *et al.*, 2020). Kim

et al. (2020) argument for finding less sensitivity of CEO *turnover* to performance in firms with higher female board participation is that, rather than terminating the CEO's contract, female directors prefer investigate the causes of underperformance, which may not be associated with the CEO, but rather with economic or market factors. Therefore, the executive's replacement evaluation would depend less on reported performance.

Similarly, Buchwald and Hottenrott (2019) argue that a lower *turnover* of executives can be a test for future performance improvement accomplished as the contribution of gender diversity on the board is based on long-term analytical competence and reduced *turnover* risk. Then, the authors focus on the understanding that the decision to keep the CEO in the office is due to a more comprehensive and strategic evaluation than just the performance itself, investigating its causes.

Although Buchwald and Hottenrott's (2019) research does not identify that women on the board are associated with reduced sensitivity of CEO *turnover* to performance, they share Kim et al. (2020) argument regarding long-term analysis and reduced CEO *turnover* when there is gender diversity on the board. In line with these authors' argument, we have the fourth and last research hypothesis:

> H4: the sensitivity of CEO *turnover* to firm performance reduces with greater gender diversity on the board.

DATA AND METHOD

The analysis was conducted with annual unbalanced panel data, containing 1,287 observations, from 199 companies listed on the Brazil Stock Exchange (Brasil, Bolsa, Balcão - B3), excluding financial and insurance companies. Considering the non-compliance with mandatory disclosure of the executive board's wages was not accompanied by a penalty until 2010, the analysis period comprised 2011 to 2018. The annual data related to corporate governance were collected via automatic importation of data contained in the Reference Forms made available on the Securities and Exchange Commission website, from the "GetDFPData" package of the R software, and direct consultation of the forms when missing data were identified. The remaining data were collected using the Thomson Reuters Eikon® database. Some missing data in the first database concerning the number of stocks, the companies stock prices, and ownership concentration were obtained from a collection in Economatica®. All exploratory data analysis procedures and other statistical techniques were conducted using R software. In order to mitigate potential problems arising from the presence of *outliers* in the sample, *winsorization* was performed at the 5th and 95th percentiles.

We admit as an assessment of the effectiveness of the monitoring performed by the board of directors, the observance of the functions of executive compensation design, quality of disclosed financial information, and CEO replacement (Faleye *et al*., 2011; Li & Wahid, 2018). In

this regard, we used variable and total executive compensation and earnings management from discretionary *accruals* as a *proxy* for financial information quality and the sensitivity of CEO *turnover* to firm performance as representative of the decision to replace the company's chief executive as dependent variables in this study.

As variables for monitoring the board of directors, we used: total executive compensation (TC), operationalized from the logarithm of total compensation in BRL (fixed + variable) in the year *t* (Sarhan *et al*., 2019; Usman *et al*., 2018); variable executive compensation (VC), operationalized from the logarithm of variable compensation in BRL (bonus, stock, stock options, and other benefits) in the year *t* (Almor *et al*., 2019; Al-Shaer & Harakeh, 2020; Baixauli-Soler *et al*., 2016; Sarhan et al., 2019); the logarithm of discretionary *accruals* as a *proxy* for earnings management (EM) calculated from Pae's (2005) model and with cash flow approach (Azeez *et al*., 2019; Saona *et al*., 2019; Zalata *et al*., 2019); and the CEO *turnover* in the year *t*+1 (TCEO), operationalized from a *dummy* that takes value 1 if the CEO (or chief executive) leaves the firm in year *t*+1, and 0 otherwise (Buchwald & Hottenrott, 2020; Kim et al., 2020).

Regarding the adoption of Pae's (2005) model, it is due to its advancement over previous models by incorporating the reversal of the *accruals* of the prior period and representative operating cash flow variables. Regarding the *proxy* for gender diversity on the board, we used the percentage of women on the board (PW), calculated from the number of women on the board divided by the total number of board members, which is expected to have a negative effect on the *proxy* monitoring. As for the CEO *turnover*, the interaction between the percentage of women on the board and the firm's performance (PWxP) was used as the variable of interest, with this performance being observed from the return on assets (ROA) under the assumption that performance has a negative effect on TCEO and the interaction has a positive and non-significant coefficient, suggesting that performance has no explanatory power on CEO replacement when there are women on the board.

As control variables, we used corporate governance variables such as board size (BS), CEO duality (DUAL), percentage of independent board members (IB), percentage of independent women on the board (IWB), and ownership concentration (OC). Furthermore, we used firm characteristics such as size (SIZ), leverage (LEV), return on assets (ROA), annual stock return (RET), *market-to-book* (MB), and *dummies* for sector and year.

As for the econometric procedures adopted, based on the Augmented Dickey-Fuller test, the series contained in the panels can be considered stationary. We used Equation 1 to analyze research hypotheses H1 and H2:

$$R_{i,t} = \alpha_0 + \beta_1 R_{t-1} + \beta_2 PW_{i,t} + \sum_{j=3}^{n} \beta_j Controls_{i,t} + \varepsilon_t \quad (1)$$

Where $R_{i,t}$ refers to the executive compensation of the firm *i* in the year *t*, assuming the total executive compensation (TC) or variable executive compensation (VC) variables; R_{t-1} refers to the compensation (total or variable) of executives of the firm *i* in the year *t*-1, in the case of the

latter, noting only firms with variable compensation greater than zero in the period *t*; $PW_{i,t}$ is the percentage of women on the board of the firm *i* in the year *t*; $Controls_{i,t}$ are variables referring to corporate governance and firm characteristics *i* in the year *t*, in addition to *dummies* for the year; ε_t is the error term of the regression.

We used Equation 2 to analyze the research hypothesis H3:

$$EM_{i,t} = \alpha_0 + \beta_1 EM_{t-1} + \beta_2 PW_{i,t} + \sum_{j=3}^{n} \beta_j Controls_{i,t} + \varepsilon_t \quad (2)$$

Where $EM_{i,t}$ refers to the firm's earnings management *i* in the year *t*, measured by the discretionary *accruals*; EM_{t-1} refers to the firm's earnings management *i* in the year *t*-1; $PW_{i,t}$ is the percentage of women on the board of the company *i* in the year *t*; $Controls_{i,t}$ are variables referring to corporate governance and firm characteristics *i* in the year *t*; ε_t is the error term of the regression.

Once we identified evidence of endogeneity of the regressors, based on the Wu-Hausman test, we performed the estimations for executive compensation and earnings management using GMM-SYS *(Generalized Method of Moments System*) because by considering problems not only of heterogeneity but also of endogeneity within the model, GMM-SYS presents more efficient estimation compared to other methods. We performed all estimations in *Two-Step*, asymptotically more efficient than the *One-Step* option. Moreover, to minimize error bias for small samples, we used the standard error correction for Windmeijer finite sample, making the *Two-Step* GMM-Sys estimation more robust.

We used Equation 3 to analyze the research hypothesis H3:

$$ln\left(\frac{p_{i,t}}{1-p_{i,t}}\right) = \alpha_0 + \beta_1 PW_{i,t} + \beta_2 ROA_{i,t} + \beta_3 PW_{i,t} \text{x } ROA_{i,t} + \sum_{j=4}^{n} \beta_j Controls_{i,t} + u_t \quad (3)$$

where $P_{i,t}$ represents the conditional probability of occurrence of CEO *turnover* in the year *t*+1; $PW_{i,t}$ is the percentage of women on the board of the firm *i* in the year *t*; $ROA_{i,t}$ is the return on assets of the firm *i* in the year *t*; $Controls_{i,t}$ are variables referring to corporate governance and firm characteristics *i* in the year *t*, in addition to *dummies* for sector and year; u_t is the error term of the regression. We used logistic regression to estimate the parameters of Equation 3.

ANALYSIS OF THE RESULTS AND DISCUSSION

Table 1 shows the descriptive statistics of the set of variables used in the study. Both the natural logarithm of the total compensation and the variable compensation of the executives show a considerable difference between the median, minimum, and maximum, demonstrating the distinction in the design and level of the compensation practiced among the companies in the sample. Similarly, when analyzing the natural logarithm of discretionary *accruals*, we can see that there is great variation in the level of earnings management by companies, influenced by several factors that lead them to make accounting choices that affect or reduce reported earnings, depending on what is most favorable at any given time.

The average CEO *turnover* in the sample is 20.28%. However, at the median, it is 0. An analysis of the frequency of CEO change over the years revealed that the percentage of *turnover* has remained stable over the sample period, also around 20%. The mean CEO *turnover* of Brazilian firms is shown to be quite similar to the average for Russian firms, at 20.8% (Kim et. al., 2020).

Table 1. Descriptive statistics of the variables

Variable	Mean	Median	Stand. Deviation	Minimum	Maximum
TC	15.6385	15.7806	1.2537	13.2358	17.7290
VC	15.0193	15.2437	1.6287	6.9976	17.1629
EM	-3.8850	-3.6860	1.1988	-10.3080	-1.2740
TCEO	0.2028	0.0000	0.4022	0.0000	1.0000
PW	0.0884	0.0000	0.1129	0.0000	0.3333
BS	8.6045	7.0000	4.9257	1.0000	30.0000
DUAL	0.1414	0.0000	0.3486	0.0000	1.0000
IB	0.2086	0.1818	0.2035	0.0000	0.6000
IWB	0.1018	0.0000	0.3025	0.0000	1.0000
OC	0.6443	0.6450	0.1825	0.3237	0.9725
ROA	6.1301	6.2558	7.1609	-9.4545	19.4483
RET	-0.0017	0.0083	0.1827	-0.3842	0.3251
SIZ	22.2151	22.8987	1.0345	20.6008	23.0134
MB	15.3800	11.0000	14.1358	1.6678	56.2195
LEV	0.3291	0.3199	0.2216	0.0007	0.8043

Source: Elaborated by the authors (2023)

Despite the average percentage of 11% in 2018, the average percentage of women on the board of Brazilian companies in the sample period amounts to 8.84%. Compared to other countries, women's representation on boards is 43.4% in France, 36.3% in Sweden, 27.2% in the United Kingdom, 22% in Spain, and 21.7% in the United States (World Economic Forum, 2020). It is worth noting that most of the empirical evidence on the effects of gender diversity on boards of directors, some with quotas for women, comes from these countries contexts.

In 685 of the 1,287 observations (53.22%), there are no women on the boards, and in 78.01%, there is at most one woman out of an average of eight seats on the boards of Brazilian companies. Furthermore, we observed that 90.52% have a maximum of two women on the board, and three or more women are observed in less than 10% of the sample.

Table 2 shows the estimates for the three monitoring *proxies*. Hansen's overidentification and Arellano and Bond's first and second-order autocorrelation tests provide evidence for not rejecting the hypotheses of exogeneity of the instruments used and non-autocorrelation among residuals, suggesting that the assumptions required for using GMM-SYS are met.

Table 2. Estimates for the board monitoring proxies

	TC_t	VC_t	EM_t	$TCEO_{t+1}$
	Eq.1	Eq.1	Eq.2	Eq.3
TC_{t-1}	0.798***	-	-	-
	(0.041)	-	-	-
VC_{t-1}	-	0.643***	-	-
	-	(0.092)	-	-
EM_{t-1}	-	-	0.069	-
	-	-	(0.078)	-
PW_t	-0.302*	-1.042**	-0.280	-0.351
	(0.162)	(0.488)	(0.493)	(0.867)
$PWxROA_t$	-	-	-	0.048
	-	-	-	(0.090)
IB_t	-	-	-0.724**	0.312
	-	-	(0.300)	(0.389)
OC_t	-	-	-0.145	-0.440
	-	-	(0.324)	(0.450)

Continue

Table 2. Estimates for the board monitoring proxies

Concludes

RET_t	0.157	-0.130	-0.475*	-
	(0.136)	(0.248)	(0.243)	-
ROA_t	0.023***	0.036***	-0.015*	-0.030**
	(0.006)	(0.011)	(0.008)	(0.013)
LEV_t	0.128	0.481	0.020	-
	(0.220)	(0.360)	(0.303)	-
SIZ_t	-0.090	-0.130	-0.142***	0.051
	(0.058)	(0.082)	(0.018)	(0.072)
MB_t	0003	0.010*	-0.001	0.011**
	(0,.004)	(0.006)	(0.004)	(0.005)
IWB_t	0.175***	0.330**	0.094	-
	(0.064)	(0.143)	(0.157)	-
Intercept	4.984***	7.538**	-	-1.549
	(1.658)	(2.521)	-	(1.739)
Sector/Year *Dummy*	No/Yes	No/Yes	No/No	Yes/Yes
No. of Observations	1,287	962	870	1,287
No. of Groups	199	163	144	199
No. of Instruments	148	148	45	-
Stat. Wald	1888.576***	246.358***	5010.376***	39.1 ***
Hansen's test	136.081	137.430	37.158	-
AR(1)	-5.072***	-4.409**	-3.657***	-
AR(2)	1.729*	-0.437	1.156	-
Mean VIF	-	-	-	2.102
Pseudo-R^2	-	-	-	0.041

Note. * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are shown in parentheses.

Source: Elaborated by the authors (2023)

The results suggest that gender diversity, represented by the percentage of women on the board, negatively influences total and variable executive compensation, as expected. Research hypotheses H1 and H2 cannot be rejected. The observed results are in line with those seen in Bugeja *et al.* (2015), Pucheta-Martínez *et al.* (2017), García-Izquierdo *et al.* (2018), Harakeh *et al.*, 2019, and Al-Shaer and Harakeh (2020), which also found a negative relationship between gender diversity and executive compensation.

As for the control variables, we observe a positive and significant effect of return on assets on total and variable executive compensation. The higher the firm's financial performance, the higher the compensation associated with its executives, which may be linked to a higher variable portion since monetary bonuses in the form of stock or stock options are implemented based on incentive policies for good performance and goal achievement, with ROA being one of the metrics. The *market-to-book* has been shown to positively influence the variable portion of executive compensation. Conversely to what was expected, the variable referring to the presence of at least one woman as an independent member on the board of directors presents a positive coefficient, suggesting that it would increase executive compensation. This result may be associated with the low representation of independent women in the companies in the sample.

We can see that the percentage of women on the board was not significant in affecting the earnings management practice of using discretionary *accruals*. In this sense, the evidence provides subsidies that do not support the argument that women on the board reduce the earnings management practice, as found in Saona *et al.* (2019) and Azeez *et al.* (2019). Thus, research hypothesis H3 is rejected. However, there is no consensus in the literature regarding the relationship between gender diversity on the board and earnings management, as noted in Azeez *et al.* (2019), Elghuweel *et al.* (2017), and Pavlović *et al.* (2018). They suggest both negative and nonexistent relationships.

As for the control variables, board independence reduces earnings management practices since directors with no ties to the company would be better monitors (Fama & Jensen, 1983), representing the interests of shareholders and seeking greater transparency in the financial information disclosed. Furthermore, the evidence points out that performance negatively influences earnings management, which is observed from stock returns, with the understanding that low market performance is an incentive for companies to manage their results to signal good expectations of future cash flows. There is also evidence of a negative influence of ROA on earnings management practices. Firm size is shown to be explanatory of earnings management, which may be associated with the higher level of external monitoring from market agents directed at larger firms, who would choose to reduce the use of discretionary *accruals*.

As for the probability of the CEO's *turnover* in the year $t+1$, we find that it increases starting with the lowest ROA in the year t. In other words, if the firm's performance is poor and the chances that the CEO will be replaced in the next year increase, which is consistent with Kim *et al.* (2020) and Buchwald and Hottenrott (2019). The analysis of the interaction coefficient (PWxROA) suggests the non-rejection of hypothesis H4 since the interactions are positive and

not significant. They provide evidence that ROA has no explanatory power over the probability of CEO replacement in companies with female board members. Therefore, this evidence suggests that, as Kim *et al.* (2020) argued, gender diversity on the board makes the judgment regarding CEO dismissal more comprehensive than observing only one performance measure. Furthermore, it suggests that women on the board are willing to offer the CEO the chance to show performance improvement.

Regarding the control variables, we see that the MB is positive and significant, opposite to the initial expectation adopted, that signaling good future results would lead to a lower probability of replacing the CEO. It is possible that the higher the company's growth expectation, the greater the possibility that chief executives will decide on voluntary *turnover* in the subsequent period, pursuing positions in other companies, given their good management performance, improved business success on their resume, and their increased visibility by competitors and *headhunter* agents, for example.

Seeking to detail further the effect of the percentage of women on the board variable on the monitoring *proxies*, we conducted estimations with percentage intervals, aiming to identify possible differences in impact from different levels of women on boards. Table 3 presents the results. The PW_10, PW_20, and PW_30 variables are *dummies*, indicating a percentage range (11% to 20%, 21% to 30%, and above 30%, respectively) of women on the board.

Table 3. Estimates for the monitoring proxies with percentage ranges of women on the board

	TC_t	VC_t	EMt	$TCEO_{t+1}$
	Eq.1	Eq.1	Eq.2	Eq.3
TC_{t-1}	0.791***	-	-	-
	(0.044)	-	-	-
VC_{t-1}	-	0.652***	-	-
	-	(0.094)	-	-
EM_{t-1}	-	-	0.064	-
	-	-	(0.078)	-
PW_10_t	0.068	0.056	-0.337**	0.270
	(0.055)	(0.107)	(0.158)	(0.269)
PW_20_t	0.028	-0.079	0.026	-0.442
	(0.066)	(0.140)	(0.176)	(0.500)
PW_30_t	-0.138*	-0.407	0.072	-0.393
	(0.073)	(0.258)	(0.155)	(0.387)
PW_10xROA_t	-	-	-	-0.048
	-	-	-	(0.031)
PW_20xROA_t	-	-	-	0.030

Continue

Concludes

Table 3. Estimates for the monitoring proxies with percentage ranges of women on the board

	TC_t	VC_t	EMt	$TCEO_{t+1}$
	-	-	-	(0.050)
PW _30xROA_t	-	-	-	0.042
	-	-	-	(0.038)
IB_t	-	-	-0.586**	0.262
	-	-	(0.291)	(0.392)
OC_t	-	-	-0.259	-0.544
	-	-	(0313)	(0.456)
RET_t	0.173	-0.147	-0,.485*	-
	(0.139)	(0.261)	(0.250)	-
ROA_t	0.022***	0.034***	-0.015*	-0.024**
	(0.006)	(0.011)	(0.008)	(0.012)
LEV_t	0.167	0.501	0.150	-
	(0.223)	(0.337)	(0.295)	-
SIZ_t	-0.101*	-0.126	-0.143***	-0.050
	(0.060)	(0.084)	(0.017)	(0.073)
MB_t	0.003	0.008	-0.0004	0.011**
	(0.004)	(0.005)	(0.004)	(0.005)
IWB_t	0.126**	0.216*	0.114	-
	(0.063)	(0.126)	(0.171)	-
Intercept	5.330***	7.302	-	0.576
	(1.728)	(2.578)	-	(1.654)
Sector/Year Dummy	No/Yes	No/Yes	No/No	Yes/Yes
No. of Observations	1,287	962	870	-
No. of Groups	199	163	144	-
No. of Instruments	152	152	49	-
Stat. Wald	2124.942***	265.476***	5376.17***	53.90***
Hansen's test	139.535	135.953	39.767	-
AR(1)	-5.222***	-5.893***	-3.634***	-
AR(2)	1.854*	-0.196	1.139	-
Mean VIF	-	-	-	2.176
Pseudo-R^2	-	-	-	0.045

Note. * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are shown in parentheses.

Source: Elaborated by the authors (2023)

When using the RT variable as a monitoring *proxy*, we observe that the above 30% level of women on the board is negative and significant, indicating that greater gender diversity on the board affects total executive compensation. Regarding variable compensation, none of the *dummies* show statistical significance. However, the intervals between 11% and 20% and above 30% show a negative sign. The effect verified in greater female participation in boards finds support in the critical mass pointed out by Konrad *et al.* (2008), in which board dynamics are affected, starting with three or more women on the board. By overcoming stereotypical views and having their presence seen as something normal, women can bring contributions, influence discussions, and raise questions and reflections with a long-term perspective. On the other hand, when representativeness is low, there would be difficulty in making meaningful contributions, as they may only be a symbolic representation of a minority, reflecting tokenism.

When using earnings management as a monitoring *proxy*, we observe that the level between 11% and 20% of women on the board is negative and significant at the 5% level, which indicates that this lower proportion of women on the board reduces earnings management practices. However, it is noteworthy that this percentage interval concentrates most of this study's sample with women on the board, which may also explain the nonverification of the negative effect in the higher percentage intervals. Therefore, there are indications that the absence of a relationship between the presence of more women on the board and earnings management is due to the low female representation in the sample, which reflects the Brazilian context.

When observing the sensitivity of CEO *turnover* to firm performance as a monitoring *proxy*, ROA is statistically significant. However, when observing the interaction variables between performance and PW intervals, we understand that in smaller intervals, up to 20% of women on the board, the coefficient is negative. Meanwhile, the coefficient is positive and not significant for 21% to 30% and above 30% of women on the board. Therefore, in firms with a higher percentage of women on the board, ROA does not have more explanatory power over the probability of CEO *turnover*. Thus, the CEO replacement decision is less sensitive to firm performance. In this direction, women may play an active role in deciding whether or not to keep the CEO during poor company performance.

In addition, we conducted additional analyses to check the consistency of the observed results. First, to check the consistency of the critical mass theory, we used an alternative *proxy* for board gender diversity: a *dummy* for the presence of three or more women on the board. However, the results were not consistent. The low female representation can explain these results on boards in Brazil since we observed the presence of three or more women on the board in only 5.13% of the sample studied, which hinders the further analysis of the critical mass theory.

Next, we used stock return as a proxy *for firm performance in the* sensitivity analysis of CEO *turnover*. The observed results were consistent with those obtained using ROA as a *proxy*.

Finally, to investigate the consistency of the effect of women's board membership on the monitoring *proxies* investigated, we performed the same steps from the estimations presented in Table 2. However, as control variables, we included some corporate governance *proxies*, such as BS, DUAL, IB, and OC. Table 4 shows the results of the estimations.

Table 4. Estimates for board monitoring *proxies* with added governance variables

	TC_t	VC_t	EMt	$TCEO_{t+1}$
	Eq.1	Eq.1	Eq.2	Eq.3
TC_{t-1}	0.755***	-	-	-
	(0.046)	-	-	-
VC_{t-1}	-	0.601***	-	-
	-	(0.082)	-	-
EM_{t-1}	-	-	0.055	-
	-	-	(0.077)	-
PW_t	-0.150	-0.726	-0.123	-0.722
	(0.165)	(0.520)	(0.470)	(0.899)
$PWxROA_t$	-	-	-	0.043
	-	-	-	(0.094)
TC_t	0.015**	0.006	-0.028**	0.060***
	(0.007)	(0.011)	(0.012)	(0.016)
$DUAL_t$	-0.067	-0.173	-0.116	0.152
	(0.058)	(0.187)	(0.175)	(0.243)
IB_t	0.475***	0.468	-0.773**	0.595
	(0.157)	(0.293)	(0.307)	(0.409)
OC_t	-0.135	-0.445	-0.210	-0.055
	(0.143)	(0.302)	(0.315)	(0.465)
RET_t	0.176	-0.168	-0.424*	-
	(0.138)	(0.243)	(0.246)	-
ROA_t	0.022***	0.036***	-0.011	-0.037***

Continue

Table 4. Estimates for board monitoring *proxies* with added governance variables Concludes

	TC_t	VC_t	EMt	$TCEO_{t+1}$
	(0.005)	(0.012)	(0.008)	(0.013)
LEV_t	0.033	0.466	0.257	-
	(0.187)	(0.403)	(0.297)	-
SIZ_t	-0.092*	-0.161*	-0.137***	0.009
	(0.053)	(0.089)	(0.017)	(0.074)
MB_t	0.003	0.010*	-0.001	0.009*
	(0.003)	(0.006)	(0.004)	(0.005)
IWB_t	0.049	0.134	0.089	-
	(0.070)	(0.157)	(0.146)	-
Intercept	5.624***	8.999***	-	-1.549
	(1,659)	(2,504)	-	(1,739)
Sector/Year Dummy	No/Yes	No/Yes	No/No	Yes/Yes
No. of Observations	1,287	962	870	1,287
No. of Groups	199	163	144	199
No. of Instruments	156	156	47	-
Stat. Wald	2380.288***	305.692***	5766.204***	51.3 ***
Hansen's test	137.234	136.482	39.525	-
AR(1)	-5.261***	-4.325***	-3.651***	-
AR(2)	1.621	-0.522	1.150	-
Mean VIF	-	-	-	2.079
Pseudo-R^2	-	-	-	0.051

Note. * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are shown in parentheses.

Source: Elaborated by the authors (2023)

Despite the verification of a negative effect of gender diversity in the board on total and variable executive compensation (Table 2) and on earnings management (Table 3), we realize, based on the results in Table 4, that when considering other variables related to corporate governance in the model, already consolidated in the literature, the percentage of women on the board loses its statistical significance, not presenting explanatory power over any of the monitoring variables. Thus, there is evidence that while gender diversity on the board reduces compensation and earnings management, this effect is outweighed by other governance variables. One possible explanation is that, as Adams and Ferreira (2009) point out, gender diversity on the board is valuable to the company when its corporate governance structure is weak. Based on this argument, we infer that when other governance instruments are scarce or insufficient, gender diversity on the board can play a stronger role in the monitoring performed by the board. Regarding CEO *turnover*, there is no evidence that adding governance *proxies* affects the previously identified relationships related to board gender diversity and performance.

CONCLUSION

This study aimed to investigate whether gender diversity on the board impacts the monitoring effectiveness in reducing total and variable executive compensation, the earnings management practice, and the sensitivity of CEO *turnover* to the performance of Brazilian publicly traded companies. We can conclude that there is evidence that gender diversity on boards affects the three monitoring functions investigated. In other words, the percentage of women on the board negatively affects total and variable executive compensation. It reduces the sensitivity of CEO *turnover* to firm performance, making the effect of return on assets and stock returns on the likelihood of a change in the firm's chief executive non-significant. Thus, the board would consider other qualitative and quantitative information besides ROA in deciding whether or not to dismiss the CEO, which, from this study's perspective, indicates better monitoring. Furthermore, percentages between 11% and 20% of women on the board negatively affect earnings management, leading to greater transparency of the financial information disclosed.

Nevertheless, it is relevant to point out that the effect of board gender diversity on two of the three functions analyzed does not remain when we consider other governance *proxies*, such as board independence, the board size, ownership concentration, and CEO duality. Thus, it suggests that board gender diversity is more valuable to the firm when its corporate governance is weak, as Adams and Ferreira (2009) point out. Therefore, the monitoring role played by the board of directors is relevant in the context of countries with low corporate governance, in which internal and external control mechanisms are poorly developed. Thus, promoting gender diversity on boards in emerging economy countries with low governance can positively affect monitoring, which helps reduce agency conflicts.

Moreover, it is essential to emphasize that adding women to the board of directors is not expected to be the only or sufficient action to solve corporate governance problems. However,

considering the issue, given the literature consulted and the evidence found in the study can lead to positive organizational results in a legal environment of low investor protection and low level of corporate governance in general. We do not intend to advocate yet, a board formed in its entirety or a greater proportion of women. However, we do intend to advocate the promotion of gender diversity as a balance that enhances the contributions offered to the decision-making and monitoring process.

This study's results may also provide interesting *insights* by bringing a different perspective on the influence of female representation on boards. In terms of practical implications, these results can contribute as a tool for a more critical understanding of the potential consequences of women's inclusion on boards by economic-financial, regulatory, social, and political actors. For example, when considering the possibility of implementing the women's quotas provided for in Bill 7179/17 and other efforts to encourage increased participation of women on boards based on diversity effects. Furthermore, as managerial implications, the results can contribute to the decision-making process regarding the appointment of women as board members and the definition of more effective monitoring mechanisms, considering the factors influencing it.

In addition, we emphasize that this study contributes to the previous literature, which is focused on developed economies and many of them with quotas for women's board participation (Azeez *et al*., 2019; García-Izquierdo et. al., 2018; Harakeh *et al*., 2019; Kim *et al*., 2020; Saona *et al*., 2019; Usman et. al., 2018). This study addresses the effects of gender diversity on the monitoring functions performed by the board in an environment characterized by low corporate governance and weak investor protection mechanisms, such as Brazil, where studies have focused on the effects of diversity on performance (Dani *et al*., 2019; Silva & Margem, 2015).

Regarding limitations, we highlight the lack of data on corporate governance for companies in Brazil, which significantly reduced the number of observations in the sample and made it impossible to collect data for potentially relevant control variables in this study's context, such as the presence of a compensation committee and an audit committee. Moreover, the corporate governance data, which were not captured by the "GetDFPData" package, were collected manually from the Reference Forms, which raises the possibility of human error. Furthermore, it should be noted that the limitation to more detailed access to data on the capital structure of the firms did not allow us to employ more detailed tests around the possible effects of that attribute, such as, for example, the effects of the female presence on the board, when considering indication derived from family relationships or even derived from sophisticated investors, which will be left for future investigations.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

AUTHORS' CONTRIBUTION

Camila de Araújo Fernandes: Conceptualization; data curation; formal analysis; Investigation; methodology; project management; resources; programs; visualization; writing - original draft; writing - review & editing.

Márcio André Veras Machado: Conceptualization; data curation; formal analysis; funding acquisition; Investigation; methodology; project administration; resources; software; supervision; validation; visualization; writing - original draft; writing - review & editing.

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