

Women's Participation in the Board of Directors and Earnings Management

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The article intends to verify the influence that women's participation in the board of directors has on the earnings management of public companies listed on B3. Earnings management was evaluated by using discretionary accruals based on the Modified Jones model. Results showed low volumes of discretionary accruals in most years. Regarding the participation of women in CA, it is noteworthy that the number of companies that had women, increased from 35% in 2011 to 42% in 2017. However, it was identified that 17 companies had women in the CA presidency in 2017, which represented only 6% of the sample. Among the four variables that captured the participation of women in the AC, all presented negative coefficients, and three were statistically significant. Therefore, it was concluded that in the sample investigated, the existence of women in CA reduced the management of results.

Keywords: Women's Participation, Administrative Council, Earnings Management

Participación de las mujeres en el consejo de administración y gestión de ingresos

El artículo pretende verificar la influencia que la participación de las mujeres en la junta directiva tiene en la gestión de ganancias de las empresas abiertas que figuran en B3. La gestión de ingresos se evaluó mediante el uso de acumulaciones discrecionales basadas en el modelo de Jones modificado. Los resultados mostraron bajos volúmenes de acumulación discrecional en la mayoría de los años. Con respecto a la participación de las mujeres en CA, cabe destacar que el número de empresas que tenían mujeres aumentó del 35% en 2011 al 42% en 2017. Sin embargo, se identificó que 17 empresas tienen mujeres en la presidencia de CA en 2017, lo que representaba solo 6% de la muestra. Entre las cuatro variables que capturaron la participación de las mujeres en el AC, todas presentaron coeficientes negativos y tres fueron estadísticamente significativas. Por lo tanto, se concluyó que, en la muestra investigada, la existencia de mujeres en CA redujo el manejo de los resultados.

Palabras clave: participación de la mujer, consejo administrativo, gestión de ingresos

Participação das mulheres no conselho de administração e o gerenciamento de resultados

O artigo objetiva verificar a influência que a participação das mulheres no conselho de administração exerce no gerenciamento de resultados das companhias abertas listadas na B3. O gerenciamento de resultados foi analisado por meio dos *accruals* discricionários baseados no modelo Jones Modificado. Os resultados demonstraram baixos volumes de *accruals* discricionários na maioria dos anos. Com relação a participação das mulheres no CA, destaca-se que o número

de empresas que possuíam mulheres aumentou de 35% em 2011 para 42% em 2017, o que representou apenas 6% da amostra. Entre as quatro variáveis que captavam a participação das mulheres no CA, todas apresentaram coeficientes negativos e três foram estatisticamente significantes. Portanto, concluiu-se que na amostra investigada, a existência de mulheres no CA reduziu o gerenciamento de resultados.

Palavras-chave: Participação das Mulheres. Conselho de Administração. Gerenciamento de Resultados

1. Introduction

Concerns with corporate governance practices are relevant to a non-corporate context, mainly as a result of the scandal reports that the United States will initiate in the countries of Europe and the East Asia, in companies such as Enron, Health South, Parmalat, Tyco, WorldCom and Xerox (Siam, Laili, & Khairi, 2014). Part of these reports are related to the earnings management (EM), which calls for two regulatory bodies, investors and professionals, as well as motivated various inquiries not a stable environment (Rajpal, 2012; Habbash, Xiao, Salama, & Dixon, 2014).

This practice can be defined as a deliberate alteration of two results, with the intention of attaining objectives of two managers or shareholders (Peasnell, Pope, & Young, 2005). Managers can use EM to reduce two shareholders to render, by means of an increase in their own remuneration, or to reduce the probability of dismissal, in the case of a lower performance of the company. The shareholders also benefit when EM is used to reduce political costs or for the hiring of burdensome lives (Wu, Chen, & Lee, 2016).

Two mechanisms of support to corporate governance, can be avoided by the Ministry of Administration, an organization formed to accompany and supervise the management of the accounting information (Siam et al., 2014). One of the main responsibilities of the administrative council is to ensure that the sharehold-

ers and other interested parties also have qualitative information about two financial results and operational companies (Peasnell et al., 2005; Shah, Zafar, & Durrani, 2009; Chen, Cheng, & Wang, 2015).

Thus, effective board action can contribute to reduced earnings management practices, increase investor protection, raise protection limits as sources of ability to derive benefits from private controls, and decrease incentives to mask company performance (Chen & Zhang, 2014). In the view of Lin and Hwang (2010), an active corporate governance system is required to oversee management, to lower agency costs and to align management and investor interests.

Among corporate governance practices, women's participation on the board of directors has been gaining importance in the literature that addresses the value and benefits of female insertion in organizational management. Given such prominence, several countries, such as Norway, Spain, France, Belgium, Italy, among others, have adopted legal mechanisms to ensure minimum participation of women in management (Carvalho da Silva & Margem, 2015).

In Brazil, an initial bill was presented in 2010 by the Federal Senate to determine a minimum percentage of women on corporate boards, aiming to raise the proportion to 40% by 2022. The bill gained strength and was approved by the House of Representatives, becoming Law n. 7,179 from 2017, requiring a minimum of

10% female-occupied chairs by 2018, 20% by 2020 and 30% by 2022 (Carvalho da Silva & Margem, 2015; Câmara dos Deputados do Brasil, 2017).

Research on women's participation on the board, such as Carter, Simkins, and Simpson (2003), Farrell and Hersch (2005), Ryan and Haslam (2005), Peni and Vähäma (2010), Ellwood and Garcia-Lacalle (2015), Reguera-Alvarado, De Fuentes, and Laffarga, (2017), question the effect of executive women on corporate performance, especially on economic performance. Srinidhi, Gul, and Tsui (2011), Gulzar and Wang (2011), Segura, Formigoni, Abreu, and Costa (2016), found a positive relationship, demonstrating that the presence of women on the board, especially in the presidency, can also contribute so earnings management also decreases.

Given this context, we seek to answer the following research question: What influence does women's participation in the board of directors have on earnings management? Thus, the objective of the study is to verify the influence that the participation of women in the board of directors has on the earnings management of public companies listed in B3.

Research becomes relevant by contributing to the expansion of knowledge about the factors that may influence the practice of earnings management. Specifically, regarding the participation of women in the board of directors, a subject that still needs attention in Brazil, due to the small number of existing researches. Therefore, female research stands out as an important governance mechanism that can contribute to reducing earnings management practices (Arun, Almahrog, & Aribi, 2015; Segura et al., 2016; Liu, Wei, & Xie, 2016; Silva Júnior & Martins, 2017). Moreover, considering the recent aspect of Law no. 7,179 / 2017, the study adds evidence about the insertion of women

in the board of directors, contributing to the analysis of the goals proposed by the Law.

2. Theoretical Referential

The structuring of the theoretical framework includes the participation of women in management and the aspects of the earnings management approach, as well as related studies that relate the topics addressed.

2.1. Women's Participation in Management

Inclusion in the labor market has encouraged the inclusion of women as entrepreneurs and managers in the pursuit of financial independence and equality. In addition, women are feeling increasingly confident about their own skills (Birley, 1989). Jonathan (2005) points out that there has been a breakdown of prejudice involving women's skills as owners and managers of enterprises.

Birley (1989) indicates that female and male entrepreneurs are similar in their business motivation. However, women appear to be different in terms of self-reliance, which is an important feature of business decisions and convey greater confidence in the accounting information disclosed because they are less likely to contain earnings management. Such characteristics are related to corporate governance, for example, considering that the female presence on the boards of directors is one of the principles of good governance (Silveira, 2014).

We can identify four conditions that restructure the board of directors and contribute to the performance of companies: the composition, characteristics, structure and process of operation. In this context, it is within the composition that is the participation and representation of ethnic minorities and women as members (Zahra & Pearce, 1989).

Women's participation on boards and on the board raises diversity, which can improve corporate performance. Adler (2001), Carter et al. (2003), Ellwood and Garcia-Lacalle (2015) and Reguera-Alvarado et al. (2017) found positive relationships between the presence of women in senior management and corporate performance. Konrad, Kramer, and Erkut (2008) show that boards with the participation of more than two women are more efficient than others.

Ryan and Haslam (2005) analyzed the companies of The Financial Times and London Stock Exchange - FTSE 100, i.e. index calculated by The Index Company represented by the 100 most representative shares of the London Stock Exchange, which have women on the board. They noted that companies performed the worst for five months prior to their participation on the board, indicating that this is usually because women assume management positions when companies are in trouble. Ellwood and Garcia-Lacalle (2015) observed that the inclusion of women provides better economic results and lower costs of neglect. Terjesen, Couto, and Francisco (2016) state in their study that female counselors increase the effectiveness of boards. Reguera-Alvarado et al. (2017) highlight that female participation in councils influences for better economic results.

In Brazil, according to the Brazilian Institute of Corporate Governance (IBGC, 2012), women occupied 7,7% of the positions on the boards of the listed Brazilian companies in 2012, in 2015 this percentage dropped to 7,2% (IBGC, 2018). When considering only the holders, women represented only 6,6% of the total (IBGC, 2018). Dal Magro, Carpes, Vergini, and Silva (2018) demonstrated that the proportion of women on the board influences the return on equity, and the proportion of women on the board also influences the market value of organizations.

2.2. Earnings Management

Earnings Management is defined as a deliberate intervention in the accounting reporting stage, originated by the managers' judgment about accounting choices or the structuring of the company's operating activities, with the objective of influencing the analysis of business performance by users of information and consequently achieve some particular benefit (Healy & Wahlen, 1999).

Xiong (2006) clarifies that the management of accounting results cannot be measured directly, and the literature has some operational models for analyzing this practice. Accordingly, Dechow, Sloan, and Sweeney (1995) indicate that the accounting results management analysis is performed by measuring non-discretionary accruals and discretionary accruals.

In accordance with the accrual basis, the accounting recognition of transactions and economic events that do not produce cash inflows or outflows, i.e. do not produce cash flows, are considered as accruals (Martinez, 2013). Non-discretionary accruals are those specific to the company's activities and are required according to the reality of the business, whereas discretionary accruals are artificial and are intended to manage accounting results (Dechow et al., 1995). Discretionary accruals allow the manager to make the decision to increase or decrease accruals for reasons beyond the reality of the business (Martinez, 2013).

Healy and Wahlen (1999) compare the likely incentives that arouse managers to manage results as follows:

- (i) linked to the capital market, aimed at modifying the perception of risk on the company by income smoothing;

- (ii) by contractual influences between the company and various groups;
- (iii) related to regulations and political costs, such as reducing monopoly profits or to bypass taxation and antitrust rules.

Nardi (2008) points out that in the organizational environment, many people have different interests and incentives, so they can use discretion to reach particular interests. In this scenario, governance becomes a mechanism for minimizing GR. Martinez (2013) also points out that the procedure for manipulating accounting results requires prudence, as such results reflect the performance of the organization, which, in turn, is information intended for various stakeholders.

2.3. Related Studies

This section presents some similar studies analyzing earnings management and women's participation on the board. Like Mohamad, Abdullah, Mokhtar, and Kamil (2010), who analyzed the relationship between aspects of corporate governance and management of accounting results (between 2005 and 2007). The results do not confirm the existence of a relationship between women's board participation and earnings management.

Srinidhi et al. (2011) investigated whether the presence of women on boards increased the quality of executive monitoring, considering a sample of 2,840 annual observations and data extracted from the S&P Compustat database (Canadian Academic Accounting Association Corporate Library). The analysis noted the diversity of boards in US companies between 2001 and 2007. The results indicated that companies with women on the board had lower earnings management practices and higher accrual quality.

The study by Moradi, Salehi, Bighi, and Najari (2012) analyzed the relationship between the characteristics

of the board of directors and the management of accounting results in the Iranian scenario, considering the companies listed on the Tehran stock exchange during the 2006 and 2009. The analysis indicated that the presence of women was still low in the companies surveyed, as only 24 companies in the sample had women (approximately 4%) on the board.

Segura et al. (2016) verified whether the presence of women on the board of directors was related to earnings management, considering a sample of 81 Bovespa companies from 2008 to 2011. The results showed that the participation of women was small in relation to the total number of board members (BD), but found a positive and significant relationship with earnings management, i.e., women's participation helped to diminish earnings management.

Table 1 presents other studies and findings on the presence of women on the board and earnings management. The results are still quite controversial, because while some researchers identified positive relationships, others found negative relationships, showing that there is still a gap that deserves attention.

Gulzar and Wang (2011) analyzed the effectiveness of corporate governance attributes in reducing earnings management for listed companies in Shanghai and Shenzhen Stock Exchange, China. The results indicated a positive and significant association between earnings management and the gender difference supported by the presence of women on the board. The authors pointed out that the presence of women contributed to the reduction of discretionary accruals, since they were less involved with fraud and manipulation of results.

Liu et al. (2016) surveyed the relationship between the Chief Financial Officer (CFO) and earnings management in companies listed on the China Stock Exchange between 1999 and 2006. The results indicated that in

Table 1. Studies of women's participation in board of directors (BD) with earnings management (EM)

Researches	Variable Analysis		Country	Results
Peni and Vahamaa (2010)	(BD) Group of executive women specific business control	(EM) earnings management	Finland	Negative Relationship
Mohamad et al. (2010)	(BD) Interaction between independent advisors, women advisors, minority directors and social responsibility corporate practices	(EM) earnings management	Malaysia	Negative Relationship
Gulzar and Wang (2011)	(BD) Governance corporate attributes	(EM) earnings management by the Modified Jones model	China	Positive Relationship
Arun et al. (2015)	(BD) gender of <i>Chief Financial Officer</i> - CFO	(EM) earnings management by the Modified Jones model	United Kingdom	Positive Relationship
Segura et al. (2016)	(BD) percentage of women on board of directors	(EM) earnings management	Brasil	Positive Relationship
Liu et al. (2016)	(BD) gender of <i>Chief Financial Officer</i> - CFO	(EM) earnings management through accounting choices and actual activities	China	Positive Relationship

companies whose CFO were female, had lower value of discretionary accruals, low total accrual and low cost of abnormal production, highlighting that the presence of women contributed positively to reduce earnings management.

3. Methodological Procedures

To meet the proposed objective, a descriptive research was conducted with documentary analysis and quantitative approach. The survey population comprised the public companies listed in B3 from 2011 to 2017. Each year, companies in the financial sector and those that did not contain all the information for all the variables used were excluded from the sample. After data collection and analysis, the survey sample consisted of 210 companies in 2011, 253 in 2012, 251 in 2013, 242 in 2014, 243 in 2015, 245 in 2016 and 262 companies in 2017.

First, we identified the variable Earnings Management - EM. For this, it was necessary to determine the total accruals, comparing the net income and operating

cash flow of the companies, calculated by the indirect method. After, by mathematical regression, the discretionary accruals were estimated. It is noteworthy that, for the GR calculation, the data was obtained from the database available from Economatica® and for the linear regression calculation, among the various theoretical methods, the Jones model, in its modified version (Dechow et al., 1995), as evidenced by Equation 1:

$$AT_{i,t} = \alpha_1 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta RT_{i,t} - \Delta CR_{i,t}}{A_{i,t-1}} \right) + \alpha_3 \left(\frac{AP_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{i,t}$$

Being that:

$AT_{i,t}$ = Total accruals of company i in year t ;

$A_{i,t-1}$ = Company total assets at year-end $t-1$;

$\Delta RT_{i,t}$ = Change in net income of company i from year $t-1$ to year t ;

$\Delta CR_{i,t}$ = Change in trade accounts receivable from company i from year $t-1$ to year t ;

$AP_{i,t}$ = Permanent and intangible assets of company i in year t ;

$\varepsilon_{i,t}$ = regression residue for company i in year t .

In this EM calculation, variables were weighted by total assets at the beginning of the period to avoid the influence of company size on results (MOURA; MAZZIONI; BIANCHET; MACÉDO, 2018). The modified Jones model has been used in international research on the influence of women on the board and the EM, such as Gulzar and Wang (2011) and Arun et al. (2015). As proxy for the participation of women in the board of directors, four variables were used: 1) Dummy for the existence of women in the Board of Directors; 2) Dummy for most women counselors; 3) Percentage of women in CA; and 4) Dummy for CA woman president. The variables and their metrics are presented in Table 2.

It is noteworthy that the data regarding the independence of the board of directors was collected manually, each year, for each company in the sample, on the

B3 website and in the Reference Form in Section 12 - Assembly and Administration, item 12.5 / 6. - Composition and professional experience of management and fiscal council, and in item 12.7 / 8 - Composition of committees. Finally, data from the control variables were collected, which may also influence the GR, as shown in table 3.

Data was collected from Economatica® database and refer to the period from 2011 to 2017. Among the several control variables, the research brought some that may interfere in the levels for the GR. On what:

- a) Size: the expected result for this variable is negative, Hochberg (2012) indicates that larger companies are subject to more intense supervision by market analysts than smaller companies, in which case the GR tends to be smaller.

Table 2. Women's participation variables on the board of directors

Variables Independent	Metrics	Base Authors	Data Source
Woman_BD	Are there women serving on the board? Yes = 1 / No = 0	Vaccari and Beuren (2017)	Form of Reference
MostWoman_BD	Are most board members women? Yes = 1 / No = 0	Brugni, Fávero, & Klotzle, and Pinto (2018)	Form of Reference
%Woman_BD	Percentage of women as a percentage of total board of directors	Farrell and Hersch (2005)	Form of Reference
PresidentWoman_CA	Is the position of council chairman held by a woman? Yes = 1 / No = 0	Post, Rahman, and Mcquillen (2015)	Form of Reference

Table 3. Control variables

Control Variables	Metrics	Base Authors	Data Source
Size	Natural Logarithm of Total Assets	Habbash et al. (2014); Rajpal (2012).	Economatica®
Return on assets	Net Income/Total Assets	Chen et al. (2015); Shah et al. (2009).	Economatica®
Growth	Change in total sales from year t-1 to year t	Du, Jian, and Lai (2017); Chen et al. (2015).	Economatica®
Debt	(Current Liabilities + Non-Current Liabilities) / Total Assets	Habbash et al. (2014); Alves (2014).	Economatica®
Corporate governance	Is the company listed on B3's Novo Mercado? Yes = 1 / No = 0	Catapan and Colauto (2014); Camargos and Barbosa (2010).	Economatica®

- b) Return on assets: the expected result for this variable is negative, as they aim to control the bias that may occur between the GR and the company's profitability, ie, it is understood that companies with higher performance are less likely to be involved in GR (Chen et al., 2015).
- c) Growth: The expected result for this variable is positive. For companies with higher growth rates are more likely to develop higher levels of discretionary accumulations, and consequently are more likely to GR (Hochberg, 2012; Du et al., 2017).
- d) Debt: the expected result for this variable is positive. According to Iudícibus and Lopes (2004) and Habbash et al. (2014) more indebted companies tend to have higher levels of GR in their financial statements, with the intention of generating some additional gain.
- e) Corporate Governance: the expected result is negative, because the lower the level of Governance, the greater the favoritism to the GR, since information asymmetry may occur between company managers and shareholders (Bowen, Rajgopal, & Venkatachalam, 2008).

Regarding data analysis, initially, there was a descriptive analysis of the main variables of interest of the

research. Then, the multiple linear regression analysis was performed to verify the influence of women's participation in the board, as well as the other control variables, in the management of results. It is noteworthy that the normality assumptions were observed through the Kolmogorov-Smirnov test; multicollinearity, through the variance inflation factor - VIF and Tolerance; homoscedasticity, by means of the Pesarán-Pesarán test; and absence of serial autocorrelation by Durbin-Watson test.

4. Analysis and Interpretation of Results

First, the descriptive statistics of the MS indicators show, as it follows: the average percentages of women on boards, the total number of companies that have women on the board, the total number of companies where women are majority on the board, and the total of companies with women occupying the position of chairman of the board of directors.

Table 4 presents the EM indicators of the sample companies for the period 2011-2017. Looking at the EM indicators, table 4 shows that in all the years studied (2011 to 2017) the major sense of the competence adjustments was to increase the results, since more than 50% of the companies had positive indicators, that is, higher than 0. It is noteworthy that, among these

Table 4. Descriptive statistics of MS indicators from 2011 to 2017

EM Indicators	Quantities of companies													
	2011		2012		2013		2014		2015		2016		2017	
	Nº	%	Nº	%	Nº	%	Nº	%	Nº	%	Nº	%	Nº	%
> -0,10	17	8	15	6	26	10	30	12	22	9	31	13	29	11
-0,10 a 0,00	73	35	101	40	92	37	81	33	77	32	74	30	90	34
0,01 a 0,10	96	46	111	44	113	45	115	48	121	50	121	49	111	42
<0,10	24	11	26	10	20	8	16	7	23	9	19	8	32	12
Total	210	100	253	100	251	100	242	100	243	100	245	100	262	100

companies that performed EM to increase the result, around 45% of them the adjustments of competence occurred in smaller proportions (0,01 to 0,10).

Table 5 shows the average percentages of women on the board of directors of companies listed in B3, from 2011 to 2017.

It is noted in table 5, that the majority of the board members of the sample companies were not women, since in 2011-2017 the average percentage of women did not exceed 10%. On the other hand, even though it does not exceed 10%, the percentage expected by Law No. 7,179-A, 2017, which determined a minimum of 10% by 2018, was reached as early as 2017. Therefore, this result is according to the expectations of the law, making this result important and a differential of the study.

It is notable that in 2011, 2012, 2014 and 2016 companies were identified in which 100% of the board of directors consisted of women (maximum = 100%). The average percentage remained at 7% in 2011, 2014 and 2016, and increased to 10% in 2017. Table 6 shows the total and percentage of companies that have women on the boards, as well as the total and percentage on the board.

Table 6 shows that the average percentage of companies that have women on the board did not exceed 42% of the total sample, and that the average percentage of companies where women are the majority on the board was extremely low, not exceeding 4% of the total sample during the period investigated. It is also observed that in 2017, there is a greater number of companies that have women on the board and companies in which women are the majority, 108 and 11, respectively.

As can be seen from international studies, female representation on councils across countries have been relatively low. To minimize this context, since 2008, Norwegian state-owned companies have been required to hire at least 40% women for advisory positions (Ahern & Dittmar, 2012). In 2012, the European Commission debated the legislation and required all public companies to hire a minimum of 40% counselors by 2020 (Ibarra, 2012), otherwise they would face heavy fines.

Given the results described in table 4, it can be said that in Brazil, this result in 2017 may be directly related to the bill presented by the Brazilian Federal Senate, which determines increasing the percentage of women on boards to 40% until 2022.

Table 5. Average percentage of women on the board of directors from 2011 to 2017

Year	Number of companies in the sample	Minimum	Maximum	Mean	Standard deviation
2011	210	0%	100%	7%	13%
2012	253	0%	100%	6%	13%
2013	251	0%	67%	6%	11%
2014	242	0%	100%	7%	13%
2015	243	0%	67%	6%	11%
2016	245	0%	100%	7%	14%
2017	262	0%	67%	10%	15%
2011-2017	1.706	0%	100%	7%	13%

Table 7 shows the totals and percentages of companies in which women are the majority in the chairmanship of the board of directors. Table 7 shows that the highest percentage of companies that have women in the board's presidency is in 2017, with 6%, and the lowest percentage is in 2014, with 2%. Despite the low percentages identified, there is an increase in gender diversity from 2011 to 2017, so the results corroborate those of Carter et al. (2003), that the

greater the gender diversity in the boards of directors and the board of directors, the lower the chance that companies will suffer from group thinking, and consequently, improve company performance.

Table 8 shows the regression coefficients, which allow us to verify the influence that the role of women on the board of directors has on the GR (dependent variable). However, before starting the analysis, it is highlighted that the GR indicators can be both

Table 6. Total women on the board of directors from 2011 to 2017

Year	Number of companies in the sample	Companies that have women on the board of directors		Companies where women are the majority on the board of directors	
		Total	Percentages	Total	Percentages
2011	210	74	35%	7	3%
2012	253	83	33%	8	3%
2013	251	77	31%	4	2%
2014	242	86	36%	5	2%
2015	243	76	31%	5	2%
2016	245	85	35%	6	2%
2017	262	108	42%	11	4%
2011-2017	1.706	-	35%	-	3%

Table 7. Total percentage of companies that have women as chairman of the board of directors from 2011 to 2017

Year	Number of companies in the sample	Companies that have women in the chairmanship of the board of directors	
		Total	Percentages
2011	210	11	5
2012	253	13	5
2013	251	6	2
2014	242	5	2
2015	243	6	2
2016	245	7	3
2017	262	17	6
2011-2017	1.706	Mean = 9	Mean = 4%

positive and negative. Thus, even if in a given company the indicator is negative, equivalent to $-0,05$, for example, it does not mean that, in proportional terms, the GR was lower than that practiced in a company that presented a positive indicator of $0,05$. The difference is in the way each performed the GR, either to reduce the result or to increase the result. Therefore, in the regression, absolute values management indicators were used.

In table 8, it is possible to see that the adjusted R^2 was 17% in all models, that is, the independent variables explain around 17% of the variation in the dependent variable (EM). This adjusted R^2 is similar to that presented in previous research, such as Hu, Li, and Zhang (2014), with R^2 between 4% and 13%, Chen et al. (2015), with regressions of R^2 between 10% and 14%, and Du et al. (2017), which showed regressions with R^2 of 10% and 12%. Thus, the percentage brought as a result in the study and supported by the independent variables can be considered acceptable.

It was verified that the F-ANOVA test was significant at 1% level, that is, the set of independent variables influences the dependent variable. The results of Durbin-Watson statistics (1,95 and 1,96) show that there are no problems of self-correlation of residues, since the value was close to two. Finally, it is verified that the variance inflation factor (VIF) and Tolerance presented low values. As a result, there is no problem of multicollinearity between the independent variables of the model. According to Hair, Babin, Money and Samouel (2005), a VIF is considered high when it is above ten.

Table 8 also shows that the four variables that capture the participation of women in the BD had negative coefficients, and only the coefficient of the variable "MostWoman_BD" was not statistically significant.

Consequently, overall, the results indicate that women's participation on the board influences the earnings management of the sample companies, i.e. the existence of women on the board may reduce the EM, confirming the results of similar studies, such as Gulzar and Wang (2011), Arun et al. (2015), Segura et al. (2016), Liu et al. (2016) and Silva Júnior and Martins (2017).

Table 8. Regression of the influence that women's participation on the board of directors has on earnings management

Variables	Coefficients			
	Model 1	Model 2	Model 3	Model 4
(Constant)	0,20***	0,20***	0,20***	0,20***
Woman_BD	-0,01**			
MostWoman_BD		-0,01		
PresidentWoman_CA			-0,02*	
%Woman_BD				-0,01*
Size	-0,02***	-0,02***	-0,02***	-0,02***
Return on assets	0,01***	0,01***	0,01***	0,01***
Growth	0,01***	0,01***	0,01***	0,01***
Debt	0,02***	0,02***	0,02***	0,02***
Corporate Governance	0,01	0,01	0,01	0,01
Adjusted R ²	0,17	0,17	0,17	0,17
F-ANOVA	59,99***	59,32***	59,77***	59,71***
Durbin-Watson	1,95	1,96	1,96	1,95
VIF/Tolerance	<10	<10	<10	<10

Regarding the control variables, table 6 shows that size, performance, growth and indebtedness influence the level of 5% under the dependent variable (EM). The only variable that did not prove significant was corporate governance. The performance variable presented a negative coefficient, that is, the better the

companies' performance, the less chance they will manage their results, confirming the research by Chen et al. (2015), that underperforming companies are more likely to engage in GR.

Growth presented a positive coefficient, that is, the more companies grow, the greater the chance they will manage their results, confirming the research by Hochberg (2012) and Du et al. (2017). The indebtedness variable also presented a positive coefficient, that is, the more indebted the companies are, the greater their chance of managing their results, corroborating the studies by Iudícibus and Lopes (2004) and Habbash et al. (2014).

The variable corporate governance also presented a positive coefficient, however, as shown in table 8, this variable was not significant. In this case, it is not possible to state that corporate governance influences the GR in the analyzed sample. In general, it is emphasized, once again, that the results found corroborate the research by Gulzar and Wang (2011), Arun et al. (2015), Segura et al. (2016), Liu et al. (2016), and Silva Júnior and Martins (2017), showing that the presence of women influences to reduce earnings management.

5. Final Considerations

The purpose of the study was to verify the influence that women's participation on the board has on the earnings management of public companies listed on B3. To this end, a descriptive research was conducted, through documented analysis and quantitative approach, in a sample of public companies listed in B3, which had data available from 2011 to 2017.

Evidence suggests that women's participation on the boards of B3 listed companies from 2011 to 2017 increased, particularly in 2017, through the

encouragement of the initial Federal Senate bill which determined a percentage amount of women on the corporate boards to raise the proportion to 40% by 2020, and subsequently with the 2017 Bill No. 7,179-A, which mandated a minimum of 10% women occupying the seats of until 2018. According to the results found, it was observed that there was an increase in the number of companies that had women working on the board (from 35% to 42% in the period).

Also relevant to this research are the findings of the multivariate analysis, in which three of the four variables that capture women's participation in the CA were significant. Consequently, the results indicated that women's participation on the board of directors influences the earnings management of the sampled companies. Thus, it is concluded that the existence of women on the board can reduce, confirming the results of similar studies, such as Gulzar and Wang (2011), Arun et al. (2015), Segura et al. (2016), Liu et al. (2016) and Silva Júnior and Martins (2017).

The research contributes to the expansion of knowledge about the factors that may influence the practice of earnings management. Specifically, regarding the participation of women in the board of directors, a subject that still needs attention in Brazil, due to the small number of existing researches. Thus, research confirms that female participation is an important governance mechanism that can contribute to reducing earnings management practices (Arun et al., 2015; Segura et al., 2016; Liu et al., 2016; Silva Júnior & Martins, 2017).

Considering that not all independent variables and control variables were significant, it is suggested that future investigations cover different metrics and even other variables in order to understand the relationships

with earnings management. Specific analysis by sector and different levels of corporate governance is also suggested. It would also be relevant to use other methodologies to calculate earnings management, such as through operational decisions.

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