Gender Diversity on Top Management Team and Environmental CSR Engagement: Can Women Make Companies Greener?

1 INTRODUCTION

In the past decades, corporate social responsibility (CSR) and diversity in workforce have become increasingly important managerial concepts (Krause, 2017). Globalization, demographic changes, and an increase in the power of corporations have encouraged changes in the way corporations interact with society, which pushed organizations to put both CSR and diversity management onto their agenda (Hansen & Seierstad, 2017).

Companies aim to meet stakeholders' expectations, through both extrinsic responsibility (i.e. economic and legal aspects) and intrinsic responsibility (i.e. ethical and philanthropic aspects) (Lin, 2019). Therefore, considering that CSR practices result from board's decisions, one can point out the importance board composition as corporate governance mechanisms in these practices' development (Rao & Tilt, 2016).

In this sense, recent literature has shown that the composition of the board of directors (BD) and board of executives (BE), is a key feature in determining the adoption of CSR practices by a company (Galbreath, 2017; García-Sánchez & Martínez-Ferrero, 2017; Khan, 2010; Kiliç et al., 2015; Zahra et al., 1993). Among BD and BE characteristics, one of the most examined is its gender diversity.

Liu (2018) explains that there are two prevailing views to why gender diversity may affect corporate behavior towards their stakeholders. First, based on gender socialization theory, women may better manage stakeholder relationships, as they are more community-minded and caring towards others, because of their upbringing (Carlson, 1972; McGuinness et al., 2017). Second, women usually reach boardrooms through different paths than their male counterparts (Zhang et al., 2013), which improves expertise on the board, and enhance group decision-making (Liu, 2018; Rao & Tilt, 2016).

Therefore, gender diversity on corporate boards should not be seen only as a gender equality question, but also as a strategy that could led to corporate performance optimization (Mori & Richard, 2019). According to Bear et al. (2010), higher number of women on boards can add different perspectives about firm's CSR practices, as well as sensitize these corporate bodies to CSR initiatives.

Catalyst (2016) reports that in the last decade there was an increase in female participation on corporate boards around the world. Since 2005, some European countries (Belgium, France, Germany, Italy, and Norway) have mandated gender quotas to increase female representation on boards to a certain level, and European Commission has considered EU-level binding quotas for such boards (Smith, 2018). However, globally, women are still underrepresented in senior level management. Only 18.2% of firms are led by a woman, while, on average, 22.3% of board members from companies in OECD countries are women, with a lower percentage in emerging economies (WEF, 2020).

In Brazil, currently there is no regulation on gender quotas for boards. There is, otherwise, a bill being discussed by the government that creates a gender quota of 30% in state-owned companies by 2022 (Projeto de Lei Nº 7179/2017). There is also an initiative called "Projeto Ganha-Ganha", which is an initiative from UN Women, International Labor Organization (ILO) and the European Union that aims to enhance women participation in senior positions in the private

sector. Nevertheless, women participation on boards in the country remains low. A Spencer Stuart report shows that, even though there was an increment in the past few years, only 10.5% of director seats were held by women in 2019 (Spencer Stuart, 2019).

Although prior research shows a positive effect of women on BE and BD towards engagement in CSR practices (Bear et al., 2010; Galbreath, 2018; McGuinness et al., 2017; Setó-Pamies, 2015), some studies report mixed or no effects (Stanwick & Stanwick, 1998; Post et al., 2011). Therefore, considering the possible link between women participation on BE and BD and a better CSR performance. Also, considering the ongoing debate of gender diversity senior corporate positions, and its relevance, especially in emerging countries, in this research we aim to investigate the effect that women representation on BE and BD may have on environmental CSR practices of Brazilian companies.

In order to achieve this goal we have assembled a sample of 96 Brazilian public traded companies, with data ranging from 2010 to 2018. Our CSR environmental practices are collected from CSRHub, and information concerning female participation on BE and BD are drawn from Reference Form (Formulário de Referência).

Our work contributes to the literature in two ways. First, we add new empirical evidence to a relatively understudied country that is the case of Brazil. Second, we address one problem that is evidenced by Fransen (2013) regarding CSR research. Several studies usually consider CSR as a single concept (i.e. they rely on only one aggregate variable to represent engagement in CSR practices). In our study we show that, even considering one CSR dimension (environment), results may vary for different practices

2 GENDER DIVERSITY ON BOARDS AND ITS EFFECT ON CSR

Beyond the importance of the context as a determinant of firm behavior, the management affects organizational performance by its actions, what could alter and adjust the social context surrounding the firm (Pfeffer & Salancik, 2003). Whereas, resource dependence theory suggests board directors brings different linkages and resources to a board, providing benefits by reducing uncertainty and facilitating strategic change (Hillman et al., 2000).

In accordance with Hillman et al. (2002), the resource dependence theory explains that individuals brings different types of resources to the boards (expertise, different perspectives, experiences, external linkages and legitimacy) and these resources could be diverse by the implementation of board diversity on its composition. Carter et al. (2010) comply to that when affirms that a diverse board could improve the information produced by the boards.

Besides any conflict and misunderstanding that can emerge because of a diverse board, it can enhance the quality of decision making, surpassing decisions made by homogeneous groups (Rao & Tilt, 2015). This occurs because a diverse board has individuals with diverse perspectives and nontraditional approaches comparing to those from Caucasian male directors and executives – which forms a more talented management group (Carter et al., 2010).

In resource dependence theory, diversity is viewed through two different dimensions: gender and ethnicity. Carter et al. (2010) explain this occurs because they have different backgrounds and human capital, which alter the decision-making of the individuals and its ability to deal with different problems. Beyond differences on educational and professional backgrounds, female directors tend to implement a more participative and democratic on decision making processes and this enhance board's decisions (Bear et al., 2010).

Terjesen et al. (2009) argue that, unlike their male counterparts, the most common paths for women to reach the boardroom are usually through community services and academia, which, according to Zhang et al. (2013), add to a firm's moral legitimacy by enhancing the salience of stakeholder claims in the firm's industry context.

Ward and Forker (2017) also argue that women bring different professional experiences and perspectives compared to men, and so, it might be expected that the presence of women on the boards can lead to more informed and strategic actions to identify better investment opportunities (Poletti-Hughes & Briano-Turrent, 2019).

The willingness to engage more in CSR practices showed by women may come from their risk aversion preference (Zou et al., 2018). Booth and Nolen (2012), Eriksson and Simpson (2010), Krause (2019), Sohn (2019), among others, have shown that women tend to be more risk averse than men. In corporate finance, female executives are more likely to show a risk aversion preference, such as choosing a conservative financial strategy, or demonstrating low confidence in corporate management (Zou et al., 2018).

Poletti-Hughes and Briano-Turrent (2019) argued that female presence on boards could improve board effectiveness and lead to identification of better investment opportunities. A better financial performance caused by gender diversity on top management is also stated by McGuinness et al. (2017), adding that gender diversity enhances social performance as well. According to Mori and Richard (2019), women on boards could bring several advantages to firm's operations, among which can highlight better communication between the board and its stakeholders and the implementation of wider CSR practices.

With gender diversity on boards and CSR practices, a company can add value by restructuring its boards and the stakeholder's demands could be taken into account, which can lead to more ethical decision making (Nadeem et al., 2017). This is also addressed by Bear et al. (2010), that states gender diversity promotes some benefits to board's decision-making process that enable them to better meet several stakeholders, increasing the effectiveness of CSR practices. Thus, women on boards help stakeholders to achieve several claims; and CSR issues are one of them (Galbreath, 2018).

Bear et al. (2010) used a sample of 51 firms, that were initially selected from *Fortune's 2009 Most Admired List* and found that the number of female directors has a positive relationship with CSR. However, according to the authors, the presence of a single woman on board may be not enough to implement a huge change on boards' decisions; this might be ought to occur when there is a higher female participation on boards. So, as indicated by Bear et al. (2010), firm's CSR increases insofar as the number of women on board also increase.

Post et al. (2011), based on a sample of 78 *Fortune 1000* companies found out that companies with three or more women in the board of directors presented a higher score of CSR strengths. Similar to what was pointed out by Bear et al. (2010), they expected that, unless boards have a significant number of women, it would be less likely to be able to shape the board decisions.

Setó-Pamies (2015) used a sample of 94 companies out of *Global 100 Most Sustainable Companies* by Corporate Knights, for 2011. She found that the percentage of women on the board of directors had a positive influence on the CSR. She concluded that female talent can play a strategic role in enabling a firm managing their social responsibility practices more appropriately.

Using a sample of 296 firms listed in the Australian Security Exchange 300 index (ASX300) by 2004-2005 period, Galbreath (2018) found a positive relationship between women on boards and CSR. Besides that, he also found that women can have a positive effect on financial performance, but this impact is indirect and mediated by CSR; i.e., gender diversity influence

boards' behavior, having a positive effect on CSR, and this contributes to an improvement on financial performance.

Nadeem et al. (2017) examined 374 firms from Australian Security Exchange for the period of 2010 to 2014, adding up to 1,756 firm-year observations. Despite the low mean percentage of women as directors (10.33%), the proportion of female directors as increased throughout the years. The empirical results founded by Nadeem et al. (2017) point out that gender diversity on boards has a positive relationship with CSR practices.

Examining a sample of 2,412 observations from Chinese listed companies for 5-year period (2009-2013), McGuiness et al. (2017) found gender diversity has a positive effect on CSR engagement. These results were accomplished for both female top-management participation on boards and female-leadership (woman as company's CEO).

We highlight that little empirical evidence on women participation on boards is shown for the Brazilian context. Brandão et al. (2017) show that there is a positive effect of gender diversity on the board of executives on financial performance in the Brazilian banking industry. Costa et al. (2019) studied the influence of women presence on the board of directors over financial performance and risk of companies. They found a positive influence of such presence on Tobin's Q, but no influence on the companies' stock volatility. Aquino et al. (2020) investigated the effect of female participation on top management team on the dividend policy of companies but found only a marginal effect in increasing the payout.

Based on the assumptions of the resource dependence theory and the theoretical discussion developed until this point, we expect that the unique female background contribute to increase board's decision quality and, by doing that, CSR practices also undergo improvements. Therefore, our study's hypothesis states that *the percentage of women on the board of directors and executives positively influences the companies' engagement in environmental practices of CSR.*

3 METHOD

3.1 Data and variables

We assembled a sample of 96 Brazilian companies from *Brasil, Bolsa, Balcão* (B3), ranging from 2010 to 2018, making up for 627 observations. Our proxies for engagement in environmental CSR practices, were collected from CSRHub database. There are three categories under environmental dimension in this database that we used as dependent variables. The first category, Energy & Climate Change (ECC), deals with corporate practices to tackle climate change, such as the reduction of greenhouse gas emissions and the use of renewable energy. The second category, Environment Policy & Reporting (EPR), addresses environmental disclosure practices. The third category, Resource Management (RMA), accounts for practices regarding the use of natural resources in the company's activities.

CSRHub is the largest global company for analyzing and evaluating CSR practices (Kreft, 2019). The scores generated by the company cover several constructs, such as the environment, community, corporate governance, and employee relations. CSRHub relies on information from several databases such as Carbon Corporate Library, Carbon Disclosure Project, EIRIS, Impact Monitor, IW Financial, Risk Metrics IVA, Thompson Reuters, Trucost and Vigeo.

Furthermore, to assess women participation on BE and BD we extracted data from the Reference Forms (Formulário de Referência), which we collected with the aid of GetDFPData R package (Perlin et al., 2019). We used the information collected to compute our independent variables. We calculated the percentage of women on BE and BD as the ratio of women executives

or directors by the total number of executives or directors. The variables used in the research are detailed in Table 1.

Table 1
Research variables

Type	Variable	Code	Description	Source
Dependent	Energy & Climate Change	ECC	Measures the company's effectiveness in addressing climate change through appropriate policies and strategies, energy efficient operations and the development of renewable energy and other alternative environmental technologies	CSRHub
	Environmental Policy and Reporting	EPR	Includes the company's environmental reporting performance, adherence to environmental reporting standards such as the Global Reporting Initiative, and compliance with transparency requests from investors, regulators and stakeholders	
	Resource Management	RMA	Covers the efficiency with which resources are used in the manufacture and supply of products and services, including those of suppliers	
Independent	Women on BE (%)	EXEC_P	Number of women on the board of executives divided by the total number of members.	Reference Form – items 12.5 and 12.6
	Women on BD (%)	DIR_P	Number of women on the board of directors divided by the total number of members.	
Control	Return on Assets	ROA	Net income divided by Total Assets	Annual Reports
	Leverage Ratio	LEV	Total Liabilities divided by Total Assets	
	Company's size	SIZE	Ln(Total Assets)	
	Industry	INDUSTRY	Set of dummy variables using the Global Industry Classification (GIC)	-
	Year	YEAR	Set of dummy variables for the observations' years	-

We also include control variables in our analysis. We used the size of the companies as a control variable, because larger companies have a better capacity to meet environmental demands and are a target of higher pressure from different stakeholders (Chih et al., 2010). Also, companies with high leverage may be more vulnerable to pressure from its creditors, reducing the propensity to invest in environmental practices (Lourenço & Branco, 2013). Finally, the company's ability to generate wealth is also related to its ability to meet environmental demands. More profitable companies have more resources to deal with environmental issues (Ruf et al., 2001).

3.2 Statistical analysis

We used the variables in Table 1 in a series of statistical analyzes. Initially, we sought to understand the behavior of environmental CSR practices and gender diversity variables through descriptive statistics. We employed summary measures and graphs that represent the behavior of the average of each variable in the period 2010-2018.

In order to analyze the impact of women presence on BE and BD we employed several regression models. We chose to use variables regarding BE and BD separately, to evaluate the effect of each variable independently.

$$CSR_{i,t} = \beta_0 + \beta_1 EXEC\_P_{i,t} + \beta_2 ROA_{i,t} + \beta_3 LEV_{i,t} + \beta_4 SIZE_{i,t} + \beta_{5:14} INDUSTRY_i + \beta_{15:22} YEAR_t + \varepsilon_{i,t} \quad (A)$$

$$CSR_{i,t} = \beta_0 + \beta_1 DIR\_P_{i,t} + \beta_2 ROA_{i,t} + \beta_3 LEV_{i,t} + \beta_4 SIZE_{i,t} + \beta_{5:14} INDUSTRY_i + \beta_{15:22} YEAR_t + \varepsilon_{i,t} \quad (B)$$

In this sense, in Model A we investigated the effect of the percentage of women on BE over environmental CSR engagement, and in Model B we did the same, considering percentage of women on BD as our independent variable. We highlight that models A and B were computed three times, one for each environmental CSR engagement practice (i.e. ECC, EPR, and RMA).

It could be argued that companies that engage more in CSR practices would be more likely to employ women on boards, which could lead to endogeneity problems in the models A and B. In order to avoid this problem, we employed two-stages least squares estimation method (2SLS). In the first stage, we used the company's size, year, industry and a variable for quality of governance to estimate EXEC_P and DIR_P. In the second stage, we used the estimated values for EXEC_P and DIR_P in the regression models.

4 RESULTS

4.1 Descriptive analysis

We begin the analysis by presenting our sample description regarding its years and industries. Results are shown in Table 2. We highlight that Utilities is the most represented industry in the sample with 122 observations, followed by Consumer Discretionary (91 observations), Materials (89 observations), and Financials (83 observations). Regarding the distribution by years, our sample starts with 36 companies in 2010, and the number of companies increase up to 85 companies in 2016, which shows that CSRHub increased the number of Brazilian companies they followed in the past few years.

Table 2
Descriptive statistics for dependent and independent variables

Industry	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Energy	2	2	3	3	3	3	4	3	2	25
Materials	9	11	11	10	10	10	10	9	9	89
Industrials	5	6	6	8	8	8	9	8	8	66
Consumer Discretionary	3	9	9	9	12	12	14	12	11	91
Consumer Staples	4	5	7	7	7	7	7	6	10	60
Healthcare	0	3	3	4	4	3	5	5	5	32
Financials	4	8	9	9	10	10	11	10	12	83
Information Technology	0	2	2	2	2	2	2	2	2	16
Communication Services	2	2	2	3	3	3	3	3	2	23
Utilities	7	9	12	13	14	15	17	17	18	122
Real Estate	0	0	2	3	3	3	3	3	3	20
Total	36	57	66	71	76	76	85	78	82	627

We then present descriptive statistics of dependent and independent variables. We relied on summary measures for all variables. Results are shown in Table 3. Concerning the dependent variables, it is worth noting that ECC shows the lowest average (55.37) and median (56.00), but it also presents the highest standard deviation, even though its range is the lowest among the three

dependent variables. This indicates that Brazilian companies engage slightly less, on average, in practices towards climate change reduction, and such practices have higher dispersion among the companies.

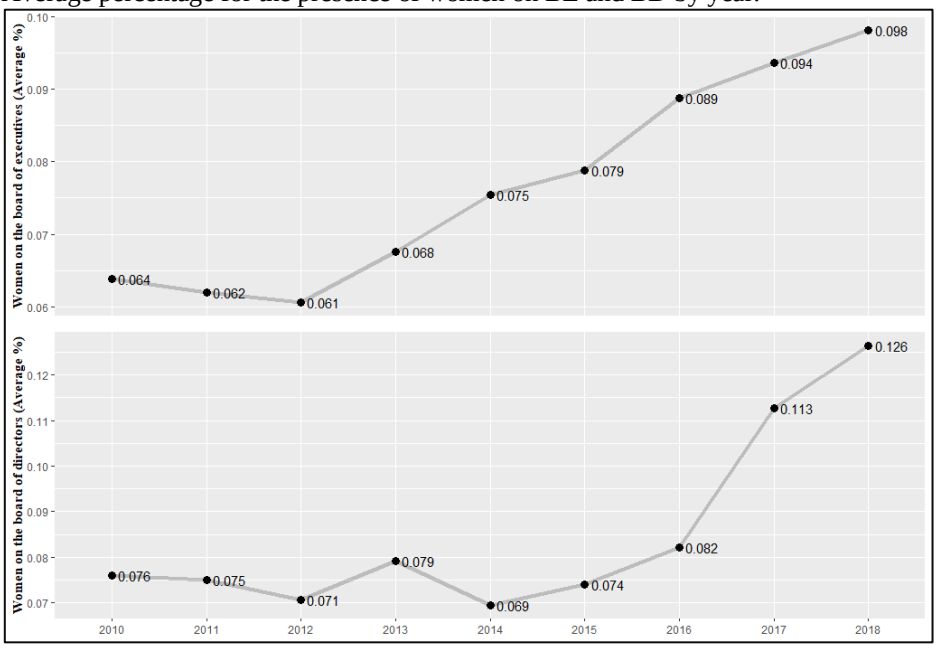
Table 3
Descriptive statistics for dependent and independent variables

Variable	Average	SD	Q1	Median	Q3	JB-Test (p-value)
ECC	55.37	10.42	48.00	56.00	63.00	0.695
EPR	58.63	9.82	52.00	59.00	65.00	0.002
RMA	56.73	9.19	51.00	57.00	62.50	0.042
EXEC_P	0.08	0.12	0.00	0.00	0.14	-
DIR_P	0.09	0.10	0.00	0.08	0.14	-

Regarding independent variables, we can see from Table 3 there is a low participation of women on both board of executives and directors. While on BE, the average for the whole period was 8%, in BD it was 9%. In the BE, median was 0, indicating that at least 50% of Brazilian companies do not have women as executives, during the 2010-2018 period.

In Figures 1 and 2, we show the average percentage of women in BE and BD, and the average score for the three environmental CSR engagement proxies, yearly. Considering the presence of women in BE, we can say from Figure 1 that the companies in our sample had the lowest average percentage in 2012, 6.1%, which increased each year up to 9.8% in 2018. Also in Figure 1, we can see that the average percentage of women on BD in our sample showed a stable behavior between 2010 and 2013, ranging from 7.1% (2012) to 7.9% (2013), then in 2014, the average percentage had its lowest value, 6.9%, but then increased yearly up to 12.6% in 2018.

Figure 1
Average percentage for the presence of women on BE and BD by year.



In Figure 2, we can see that ECC presents the lowest average in seven out of nine years (2011 to 2015, 2017, and 2018), while EPR presents the highest average in five years (2011, 2014, 2015, 2017, and 2018). All three dimensions of environmental CSR engagement showed a low average score in 2012 (the lowest average for ECC and RMA), and a high average score in 2016 (the highest average for ECC and RMA as well).

Figure 2
Average score for ECC, EPR, and RMA by year.

In summary, descriptive statistics reveal that, beside an increasing in women participation in the past few years, their representation is still low, reaching only 9.8% for the board of executives, and 12.6% for the board of directors. Concerning environmental CSR engagement practices, we can see that the companies in our sample tend to adopt, on average, an instrumental view of CSR, since the average for ECC is lower than EPR and RMA. CSR practices that focus on reporting (EPR) and a most efficient use of resources (RMA), have more tangible benefits than practices that aim to tackle climate change like the reduction of greenhouse gas emissions and the use of renewable energy sources.

4.2 Inferential and multivariate analysis

We then conducted four comparisons for the companies in our samples. First, we separated the observations by the existence of women in BE (Table 4) and BD (Table 5) and compared their environmental practices. In each case, we compared the companies' environmental practices using a series of T tests, since Jarque-Bera tests in Table 3 showed the normal behavior of these variables.

Table 4
Environmental engagement comparison between boards of executives with and without women

	Women on the executive board	N obs	Average	SD	Median	Min	Max	T Test
ECC	No	371	54.39	10.77	55.00	26.00	90.00	-2.89 (***)
	Yes	256	56.78	9.74	58.00	31.00	82.00	
EPR	No	371	57.86	10.33	58.00	23.00	89.00	-2.44 (**)
	Yes	256	59.75	8.94	60.00	22.00	81.00	
RMA	No	371	56.32	9.70	57.00	24.00	89.00	-1.38
	Yes	256	57.32	8.39	57.00	30.00	82.00	

Note: (*) – p-value < 0.10; (**) – p-value < 0.05; (***) – p-value < 0.01.

Considering the presence of women on BE, there are 256 observations with at least one woman in it. On such boards the average for all three environmental engagement proxies were higher when compared to BEs without women. However, the difference between the two groups shows statistical significance only for ECC (p-value < 0.01) and EPR (p-value < 0.05).

Table 5
Environmental engagement comparison between boards of directors with and without women

	Women on the board of directors	N obs	Average	SD	Median	Min	Max	T Test
ECC	No	278	54.41	10.54	55.00	26.00	86.00	-2.06 (**)
	Yes	349	56.13	10.28	57.00	26.00	90.00	
EPR	No	278	58.27	9.75	59.00	22.00	87.00	-0.83
	Yes	349	58.92	9.89	59.00	23.00	89.00	
RMA	No	278	56.96	9.37	57.00	30.00	87.00	0.56
	Yes	349	56.54	9.06	57.00	24.00	89.00	

Note: (*) – p-value < 0.10; (**) – p-value < 0.05; (***) – p-value < 0.01.

Considering the presence of women on BD, there are 349 observations with at least one woman in it. On such boards the average for ECC and EPR were higher than on BDs without woman, while for RMA, the opposite situation is observed. However, only the difference observed for ECC is statistically significant (p-value < 0.05).

In the last step of the analysis, we conducted a series of 2SLS, to access the effect of the percentage of women on BE (models 1A, 2A, and 3A), and BD (models 1B, 2B, and 3B), on environmental CSR engagement. Results are shown in Table 6.

Results on Table 6 show that the percentage of women on BE (EXEC_P) had a positive impact on all three measures of environmental CSR engagement (p-value < 0.01), whereas the percentage of women on BD (DIR_P) had a positive impact on ECC and EPR (p-value < 0.01), but had no significant effect on RMA.

Beside the significance of the variables, it is noteworthy that the models using EXEC_P as independent variables, all showed higher adjusted R^2 and lower Akaike Information Criteria (AIC), compared to the models with DIR_P as independent variables. These results show that the models with EXEC_P have a better trade-off between model complexity and explanation power, which allow us to infer that women on BE is a better predictor to environmental CSR engagement than women on BD.

Table 6
2SLS regression models

	ECC		EPR		RMA	
	Model 1A	Model 1B	Model 2A	Model 2B	Model 3A	Model 3B
Intercept	31.63 (7.25) (***)	45.56 (9.40) (***)	21.59 (5.24) (***)	36.59 (7.80) (***)	43.26 (10.10) (***)	60.61 (12.82) (***)
EXEC_P	2.55 (11.79) (***)		2.71 (13.29) (***)		2.31 (10.89) (***)	
DIR_P		0.91 (2.89) (***)		0.95 (3.10) (***)		0.06 (0.19)
ROA	-0.64 (-0.14)	-1.61 (-0.31)	4.28 (0.96)	3.29 (0.65)	-3.95 (-0.86)	-3.70 (-0.73)
LEV	6.74 (3.30) (***)	7.98 (3.55) (***)	5.74 (2.98) (***)	7.07 (3.25) (***)	0.76 (0.38)	2.13 (0.97)
SIZE	0.35 (1.07)	-0.04 (-0.11)	0.82 (2.67) (***)	0.41 (1.18)	-0.34 (-1.07)	-0.66 (-1.91)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.43	0.31	0.42	0.27	0.29	0.15
R^2-Adj	0.41	0.28	0.40	0.24	0.26	0.12
F Test	20.48 (***)	12.05 (***)	20.23 (***)	10.02 (***)	11.17 (***)	4.84 (***)
AIC	4,416,29	4,537.59	4,345.13	4,496.15	4,393.88	4,506.21
N	627	627	627	627	627	627

Note: (*) – p-value < 0.10; (**) – p-value < 0.05; (***) – p-value < 0.01.

Among the control variables, leverage (LEV) showed a positive, statistically significant influence over ECC and EPR (p-value < 0.01), while size (SIZE) was only significant to explain EPR, showing a p-value under 0.01 for Model A. We highlight that no model presented multicollinearity problems among independent or control variables, since the VIFs for all variables in the three models ranged from 1.03 to 3.24, and all models were statistically significant, since all F tests showed a p-value under 0.01.

5 DISCUSSION

The research goes deeper into the relationship between governance characteristics and engagement in CSR practices. This is due to the fact of investigating the influence of the gender diversity in top management on three proxies that seek to reflect different aspects of environmental engagement. Our results show a positive influence of the percentage of women on BE and BD on environmental CSR engagement. More precisely, women on BE positively affected all three proxies of environmental CSR engagement, and women on BD positively affected practices related

to environmental reporting and climate change. This is in line with results from Tables 4 and 5, from which we can see that boards with women scored significantly higher in environmental CSR engagement scores, especially in practices towards climate change. Thus, our research hypothesis is confirmed by our results.

One can argue that these results reveal that the presence of women on the board reduces the instrumental view of CSR practices by the companies, favoring a more strategic (normative) view of such practices. This is the case because the presence of women on the board makes the company more favorable not only to reporting practices, but also practices that aim to tackle climate change, while practices of resource management have a similar average in both boards, and the presence of woman on BD is not significant to explain it (Model 3B). This means that in some instrumental practices like resource management, boards with and without women behaves in a similar way. For more strategic practices like tackling climate change, boards with women tend to perform better.

This is in line with the work of Setó-Pamies (2015) that found out that the greater the number of women on the board of directors, more socially responsible were the company. She argues that when the number of women on the board increases, it improves relations with stakeholders, accountability, prompts more ethical behavior, and shows a greater concern for the environment. She also argues that different ways men and women solve the problems of firms, are important to guarantee a balanced focus in the economic, environmental, and social fields.

Following a similar logic, Liu (2018) states that there are two reasons why board gender diversity should improve the quality of corporate decision-making towards environmental issues. First, female directors bring different perspectives in relation to managing environmental exposure, presenting greater concern for third-party stakeholders. These diverse perspectives can make the board take into account non-economic considerations beyond the impact of improving environmental performance on firm financial performance. Secondly, a greater female presence on the board can disrupt existing trust relationships among directors, thus reducing the level of complacency regarding environmental policies and practices, which leads to higher quality decision-making to avoid violations and consequent litigation.

Furthermore, Atif et al. (2020) show that the presence of two or more women on the board increase the renewable energy consumption of American companies, which is in line with our result that showed that boards with women tend to adopt more practices that focus to tackle climate change. Their result show that there is a critical mass of women (at least two) that is needed in order to change the board behavior towards a more environmentally friendly approach. This is in line with the idea that the greater percentage of women in both BE and BD increases the companies' adoption of environmental CSR practices.

6 CONCLUSION

We sought to identify the effect of gender diversity on both board of executives and board of directors on the engagement of CSR environmental practices in Brazilian companies. We differ from previous studies, as we consider three separate proxies of environmental engagement that capture different aspects, namely, environmental disclosure, resource management, and practices that tackle climate change.

Our results show that, in general, the presence of women on BE and BD, as well as a higher percentage of women on both boards, boost environmental engagement in several ways. We found that board of executives with women showed higher averages of environmental disclosure and engaged more in practices against climate change, while a greater percentage of women in this board positively influenced all three forms of environmental engagement. Concerning the presence

of women on the board of directors, we found out that their presence increased the engagement in practices that tackle climate change, and a higher percentage of women had a positive influence on environmental disclosure as well.

It is also noteworthy that women on BE, aside from the greater influence they showed on environmental engagement compared to women on BD, regression results showed that they constituted a better predictor of all three environmental CSR practices we adopted in this research. This indicates that, even though gender diversity on BD is more scrutinized in the literature that relates corporate governance and CSR, women on BE may bear more importance in improving CSR practices, at least when we consider environmental practices of Brazilian companies.

As limitations of the research, we first highlight that the metrics used for environmental CSR engagement are based on scores calculated by a third party (CSRHub). So, the sample is limited to companies with data available for analysis (i.e. the companies followed by CSRHub). Aside from that, it should be noted that there is an increase in the companies that make up the sample over the period under analysis, which may have an impact on the results.

For future research, we suggest the use of other dimensions of CSR, which concern issues related to the community and employees, for example. Such an examination, together with the analysis of issues related to the environment, may shed more light on gender diversity on board of executives and directors in Brazilian companies can affect the engagement in socially responsible practices.

References

Almeida, T. A., de Morais, C. R. F., & Coelho, A. C. (2020). Gender diversity, governance and dividend policy in Brazil. *Revista de Gestão*, *27*(2), 189-205.

Atif, M., Hossain, M., Alam, M. S., & Goergen, M. (2020). Does board gender diversity affect renewable energy consumption? *Journal of Corporate Finance*.

Bear, S., Rahman, N., & Post, C. (2010). The impact of board diversity and gender composition on corporate social responsibility and firm reputation. *Journal of business ethics*, *97*(2), 207-221.

Booth, A., & Nolen, P. (2012). Choosing to compete: How different are girls and boys? *Journal of Economic Behavior & Organization*, *81*(2), 542-555.

Brandão, I. F., Diógenes, A. S. M., & de Abreu, M. C. S. (2017). Value allocation to stakeholder employees and its effect on the competitiveness of the banking sector. *Revista Brasileira de Gestão de Negócios-RBGN*, *19*(64), 161-179.

Carlson, R. (1972). Understanding women: Implications for personality theory and research. *Journal of Social Issues*, *28*(2), 17-32.

Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review*, *18*(5), 396-414.

Chih, H. L., Chih, H. H., & Chen, T. Y. (2010). On the determinants of corporate social responsibility: International evidence on the financial industry. *Journal of Business Ethics*, *93*(1), 115-135.

Costa, L., Sampaio, J. D. O., & Flores, E. S. (2019). Diversidade de Gênero nos Conselhos Administrativos e sua Relação com Desempenho e Risco Financeiro nas Empresas Familiares. *Revista de Administração Contemporânea*, *23*(6), 721-738.

Eriksson, K., & Simpson, B. (2010). Emotional reactions to losing explain gender differences in entering a risky lottery. *Judgment and Decision Making*, *5*(3), 159.

Fransen, L. (2013). The embeddedness of responsible business practice: Exploring the interaction between national-institutional environments and corporate social responsibility. *Journal of business ethics*, *115*(2), 213-227.

Galbreath, J. (2017). The impact of board structure on corporate social responsibility: A temporal view. *Business Strategy and the Environment*, *26*(3), 358-370.

Galbreath, J. (2018). Is board gender diversity linked to financial performance? The mediating mechanism of CSR. *Business & Society*, *57*(5), 863-889.

Hansen, K., & Seierstad, C. (2017). Introduction: CSR and diversity management. In *Corporate Social Responsibility and Diversity Management* (pp. 1-40). Springer, Cham.

Hillman, A. J., Cannella Jr, A. A., & Harris, I. C. (2002). Women and racial minorities in the boardroom: How do directors differ? *Journal of management*, *28*(6), 747-763.

Hillman, A. J., Cannella, A. A., & Paetzold, R. L. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management studies*, *37*(2), 235-256.

Khan, H. U. Z. (2010). The effect of corporate governance elements on corporate social responsibility (CSR) reporting: Empirical evidence from private commercial banks of Bangladesh. *International Journal of Law and Management*, *52*(2), 82-109.

Kiliç, M., Kuzey, C., & Uyar, A. (2015). The impact of ownership and board structure on Corporate Social Responsibility (CSR) reporting in the Turkish banking industry. *Corporate Governance*.

Krause, B. L. (2019). Risk Aversion and Diversification Strategies. *Journal of International Development*, *31*(7), 545-577.

Krause, F. (2017). Corporate social responsibility and diversity management: a win-win situation? Comments from the case of Germany. In *Corporate Social Responsibility and Diversity Management* (pp. 75-91). Springer, Cham.

Kreft, J. (2019). CSR Ratings and Contradiction of Real and Communicated Aims of Media Organization: The Case of News Corporation. In *Eurasian Business Perspectives* (pp. 139-155). Springer, Cham.

Lin, C. P. (2019). Modeling corporate citizenship and turnover intention: social identity and expectancy theories. *Review of Managerial Science*, *13*(4), 823-840.

Liu, C. (2018). Are women greener? Corporate gender diversity and environmental violations. *Journal of Corporate Finance*, *52*, 118-142.

Lourenço, I. C., & Branco, M. C. (2013). Determinants of corporate sustainability performance in emerging markets: the Brazilian case. *Journal of Cleaner Production*, *57*, 134-141.

Martínez-Ferrero, J., & García-Sánchez, I. M. (2017). Coercive, normative and mimetic isomorphism as determinants of the voluntary assurance of sustainability reports. *International Business Review*, *26*(1), 102-118.

McGuinness, P. B., Vieito, J. P., & Wang, M. (2017). The role of board gender and foreign ownership in the CSR performance of Chinese listed firms. *Journal of Corporate Finance*, *42*, 75-99.

Mori, N., & Richard, E. (2019). Board Gender Diversity: Challenges and Implications for Corporations in the East African Community. *Journal of African Business*, *20*(2), 224-241.

Nadeem, M., Zaman, R., & Saleem, I. (2017). Boardroom gender diversity and corporate sustainability practices: Evidence from Australian Securities Exchange listed firms. *Journal of Cleaner Production*, *149*, 874-885.

Perlin, M. S., Kirch, G., & Vancin, D. (2019). Accessing financial reports and corporate events with GetDFPData. *Brazilian Review of Finance*, *17*(3), 85-108.

Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.

Poletti-Hughes, J., & Briano-Turrent, G. C. (2019). Gender diversity on the board of directors and corporate risk: A behavioural agency theory perspective. *International Review of Financial Analysis*, *62*, 80-90.

Post, C., Rahman, N., & Rubow, E. (2011). Green governance: Boards of directors' composition and environmental corporate social responsibility. *Business & Society*, *50*(1), 189-223.

Rao, K., & Tilt, C. (2016). Board composition and corporate social responsibility: The role of diversity, gender, strategy and decision making. *Journal of Business Ethics*, *138*(2), 327-347.

Ruf, B. M., Muralidhar, K., Brown, R. M., Janney, J. J., & Paul, K. (2001). An empirical investigation of the relationship between change in corporate social performance and financial performance: A stakeholder theory perspective. *Journal of business ethics*, *32*(2), 143-156.

Setó-Pamies, D. (2015). The relationship between women directors and corporate social responsibility. *Corporate Social Responsibility and Environmental Management*, *22*(6), 334-345.

Sohn, K. (2019). Understanding the order effect in eliciting risk aversion. *Finance Research Letters*, *30*, 314-317.

Stanwick, P. A., & Stanwick, S. D. (1998). The relationship between corporate social performance, and organizational size, financial performance, and environmental performance: An empirical examination. *Journal of business ethics*, *17*(2), 195-204.

Terjesen, S., Sealy, R., & Singh, V. (2009). Women directors on corporate boards: A review and research agenda. *Corporate governance: an international review*, *17*(3), 320-337.

Ward, A. M., & Forker, J. (2017). Financial management effectiveness and board gender diversity in member-governed, community financial institutions. *Journal of business ethics*, *141*(2), 351-366.

Zahra, S. A. (1993). Environment, corporate entrepreneurship, and financial performance: A taxonomic approach. *Journal of business venturing*, *8*(4), 319-340.

Zhang, J. Q., Zhu, H., & Ding, H. B. (2013). Board composition and corporate social responsibility: An empirical investigation in the post Sarbanes-Oxley era. *Journal of business ethics*, *114*(3), 381-392.

Zou, Z., Wu, Y., Zhu, Q., & Yang, S. (2018). Do female executives prioritize corporate social responsibility? *Emerging Markets Finance and Trade*, *54*(13), 2965-2981.