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Does Gender Diversity Affect the Environmental Performance of Banks?

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Received: 4 November 2020; Accepted: 4 December 2020; Published: 5 December 2020

Abstract: Climate change is one of the greatest challenges facing humanity today. Therefore, all segments of society must act together to stop the deterioration of the planet and the depletion of its resources. The business sector must play an active role in acting responsibly toward the environment. Given the importance of this issue, major efforts have been made to analyze the environmental performance of the most polluting sectors. In contrast, other sectors that are also of great interest due to their contribution to sustainable development, such as the banking sector, have been overlooked. Notable factors conditioning performance include aspects of corporate governance such as gender diversity. However, the empirical evidence reveals a lack of consensus regarding the influence of women directors on corporate environmental performance. This background motivates the study of the commitment of the banking sector to reducing their environmental impact and the analysis the influence of board gender diversity on environmental performance. Data for the period 2009 to 2018 on 52 banks from the most polluting Western regions were studied using descriptive statistics and fixed effects econometric estimation to test the relationship between a selection of relevant variables. The key conclusions are that banks are committed to protecting the environment and that there are no significant differences between banks' commitment to the planet on the basis of board gender diversity.

Keywords: corporate social responsibility; environmental performance; climate change; gender diversity; board of directors; banking sector

1. Introduction

Climate change is one of the biggest challenges facing the planet. It is of vital importance, given its role as a cause of global warming. This phenomenon is having serious consequences throughout the entire planet, including rising sea levels, the flooding of low-lying coastal areas, extreme weather conditions, and severe difficulties for plants and animals to adapt to the new temperatures, potentially leading to the extinction of some species [1]. This irreversible damage is largely caused by human activity. Although some greenhouse gases (GHGs) are released naturally, human actions such as the burning of coal, oil, and gas are increasing the concentration of these gases [2]. Accordingly, in addition to appealing to governments to act following the adoption of the Sustainable Development Goals (SDGs), the United Nations has also called upon the private sector, civil society, and individuals. This call has been made under the premise that joint action is needed to achieve sustainable global economic development that respects the planet and its resources [3]. Otherwise, an environmental catastrophe is foreseen within 30 years [4].

Companies affect their surroundings through their economic activity. Therefore, it is essential that, while pursuing economic profit, they also ensure a positive social and environmental impact,

as well as a close-knit relationship with their stakeholders [5]. For this reason, they should consider all elements of corporate social responsibility (CSR) [6]. As business strategies have shifted towards more environmentally responsible practices in an attempt to achieve sustainable development [7], the number of researchers in this area has likewise grown. These scholars have examined the relationships between environmental performance and other variables, including the characteristics of the board of directors [8].

Among the numerous board characteristics that can be used for analysis, gender diversity is considered an essential factor for responsible practices [9]. It is therefore to be expected that women directors act differently from men in response to climate change, given women's greater awareness of the threat it poses and their greater willingness to combat it [10]. The greater commitment of women to ethical standards helps them address social and environmental problems in a more sensible manner [11,12]. For example, Arayssi, Dah, and Jizi [13] have provided evidence that women managers increase the environmental performance of companies by disseminating information to stakeholders and participating in decision making on environmental undertakings. However, the results of previous studies offer mixed conclusions [14–16], highlighting the need for further research to clarify the direction and robustness of the relationship between gender diversity and environmental performance.

According to Pillai et al. [17], the role of the private sector is fundamental to increase awareness and corporate action in support of the 2030 SDGs. It is imperative that firms apply their creative and innovative capacities to resolve the challenges of sustainable development [18]. Most research on the environmental performance of the business community tends to focus on the sectors that are considered the worst polluters, such as the manufacturing industry [14,19]. Insufficient attention has been paid to the service sector, particularly the banking sector, given its central role in the economy and its contribution to sustainable development.

The growing role of the financial sector in the development of Western economies over the last 30 years must be addressed. The role of the banking sector has conditioned both long-term economic growth and the volatility of this growth [20]. Similarly, the importance of banks is supported by their mission, namely, to act as intermediaries tasked with efficiently allocating resources by channeling the savings of one group of individuals toward another group of individuals in need to funds. This second group then invests these funds, thereby creating development and social well-being. Moreover, the banking sector also has a relevant role in ensuring that the business community adopts the SDGs, given that substantial amounts of funding are needed to implement these SDGs [21].

According to Buchner et al. [22], large investments are needed to research alternatives to fight climate change, and a high level of financing is required to implement projects to develop these alternatives and ensure a sustainable planet. Therefore, although the activities of banks do not have a direct impact on the environment, they can exert a positive influence by financing projects that help mitigate harmful effects [23]. Hence, banks play a central role in environmental performance by providing financial resources to other sectors.

Consequently, the importance of this sector leads us to analyze its involvement in environmental action. Similarly, we aim to ascertain whether gender diversity in the managerial echelons of banks actually leads to a difference in their environmental performance. In the literature, the corporate governance of such entities has generally been linked to aspects such as economic or financial performance [24–26], with some recent studies linking it to environmental, social, and governance (ESG) performance [27,28]. To the best of our knowledge, however, only one study has examined the environmental performance of the banking sector [29], although this issue has been studied using multi-sector samples [19,30,31]. Likewise, it may be concluded that the possible relationship between board gender diversity and environmental performance in this sector has received scant attention.

Consequently, our research aims are justified by the importance of climate change, the possible influence of gender diversity on this phenomenon, the lack of consensus in the literature, the lack of studies of the banking sector's role in this area, and the status of North America and Europe as the most polluting Western regions [32]. Our first research aim is to analyze the environmental performance

scores of the European and North American banking sector. This analysis can shed light on the level of involvement of banks in undertaking environmentally friendly, or at least non-harmful, actions to mitigate climate change. In addition, we also aim to ascertain whether gender diversity on the board of directors is a differentiating factor among banks with different environmental performance scores. The study is based on the SDGs pertaining to the "Planet" pillar, which is focused on the environment and the fight against climate change [3]. A sample of the largest European and North American banks by market capitalization was used to conduct descriptive statistical analysis and to estimate a fixed effects model.

To the best of our knowledge, this research differs from earlier studies in the following ways. These differences constitute the contribution of our study. First, this study offers the first characterization of the environmental involvement of the European and North American banking sector. This aspect is important for the literature for two reasons. First, for years, the banking sector has been viewed as a non-polluting sector given the nature of its activity [33]. Accordingly, interest in environmental concerns began to target the banking sector much later than the manufacturing sector [34]. Moreover, this sector represents a system that operates under centralized economic and monetary principles. Accordingly, the social and environmental costs associated with banking activity have traditionally been overlooked. Therefore, the banking sector still lacks these values in a context in which environmental damage has enormous scope and has accentuated the inequalities between the rich and the poor. Thus, it is fundamental to achieve social and environmental justice [35,36] and to strengthen social capital [37]. In addition, banking operations can have a powerful environmental impact through the intense use of energy required for the upkeep of buildings and electronic equipment, the generation of waste, and the distribution of financial resources for purposes that ultimately affect society and the environment [33]. This study aims to cover a gap in the research on the role of businesses in protecting the environment. The study achieves its aim by examining a sector that has received little attention (given the perception of the sector as a non-polluter) and that has taken a long time to become involved in protecting the environment, despite its undeniable strategic role in the value chain of the economic system.

Another differentiating factor of this study with respect to existing research is that it provides the first analysis of the role of board gender diversity in the environmental performance of the most polluting Western regions (North America and Europe). The study thus provides critical evidence to fill the current gaps in the literature. Specifically, the studies of this relationship reveal a lack of consensus. They have virtually ignored the banking sector, despite the aforementioned distinctive characteristics of this sector regarding its involvement in fighting climate change and its role as an economic agent. These factors indicate the need for special attention to be paid to this sector.

Finally, this study also offers the first use of a particular measure of gender diversity. The aim is to test the argument that it is necessary to achieve 30% representation of women board members to bring about change in the trend of environmental performance in the firms under analysis. An additional advantage is that the empirical analysis is based on a greater number of gender diversity measures than typically found in previous studies.

The article has five further sections following this introduction. Section 2 presents a review of the literature on the relationship between environmental performance and gender diversity. Section 3 explains the sample selection and provides justification for the method. Section 4 presents and discusses the results. Finally, Section 5 offers the conclusions, limitations, and proposals for future lines of research.

2. Board Gender Diversity and Environmental Performance: Literature Review and Research Hypothesis

Gender diversity is the subject of current debate in developed countries [38]. Numerous authors have studied the influence of women on corporate social responsibility (CSR) and, more specifically, the environmental dimension of CSR [16].

Several of these studies have concluded that companies with female representation on the board are more socially and environmentally responsible [19,39]. For example, they engage in more fundraising for social benefits [40], greater participation in decision making on environmental undertakings [13], and increased dissemination of non-financial information to stakeholders, notably with the Carbon Disclosure Project (CDP) [41]. Similarly, according to Cucchiella, D'Adamo, Gastaldi, Koh, and Rosa [42], women are more likely to adopt renewable energy systems as an alternative energy.

Li et al. [43] stress the importance of board gender diversity, specifically in the most polluting companies, because it encourages better development of environmental policies. The importance of gender diversity stems from the differences in the moral and social value systems of the two genders [44]. For instance, women are more aware of the importance of the stakeholders' well-being [45]. They are also more collaborative, which encourages the sharing of information [46]. Men, in contrast, are more competitive and ambitious [47]. However, the effectiveness of the role of women on the board may be weakened by increased conflict among members when there are at least three women directors [48].

Given these differentiating characteristics between men and women, the values and attributes of board members condition the board's decision making [49]. Therefore, the possible relationship between board gender diversity and CSR is based on three principal theories [50]: agency theory, resource dependence theory, and stakeholder theory.

The first of these three theories, agency theory [51], is based on the idea that greater board independence, due to, among other factors, the greater variety introduced by gender diversity, enabling greater control by reducing the costs derived from agency problems [52], thereby improving environmental action [15].

Similarly, the members of the board act as intermediaries between the company and the outside world. Therefore, resource dependence theory [53] would suggest that the inclusion of women on the board of directors enables greater access to resources and information channels by providing a wider network of contacts, which is particularly important for increasing the value of the business [54]. This situation can lead to better decision making [55] and the implementation of CSR policies such as those relating to the environmental dimension [15,56].

Third, the relationship studied in the present research can also be explained in terms of stakeholder theory [57], given that gender diversity can influence the implementation of environmental practices to meet the expectations of stakeholders [15]. The argument behind this idea is that women focus more on social well-being, given attributes such as emotional intelligence and the ability to understand and represent the needs of stakeholders [45].

In addition to the earlier arguments, an assessment of the consensus of previously reported empirical results reveals mixed findings. Some studies have confirmed a positive and significant relationship between the variables of interest. For example, Elmagrhi et al. [15] showed that the proportion of women on the board of directors positively affects environmental performance in terms of both putting in place environmental strategies and implementing and disseminating these strategies. Furthermore, Lu and Herremans [14] showed the existence of a positive relationship between gender diversity and environmental performance, emphasizing the significance of the results in relation to companies with a bigger environmental impact. Similarly, Liu [58] reported that companies with greater gender diversity are sued less often for environmental infringements.

By contrast, studies such as that of Walls, Berrone, and Phan [59] have shown that gender diversity does not influence environmental performance, a finding that has also been reported in relation to the banking sector [60]. This finding concurs with those of Prado-Lorenzo and García-Sánchez [61], who reported a positive but non-significant relationship between board gender diversity and the dissemination of information on GHG emissions. Alazzani et al. [16] found a positive influence of women on social performance but not on environmental performance, with this relationship being determined by the culture of the location where the company operates. This finding is supported by those of Fakoya and Nakeng [62], who reported that an increase in the number of women is not related

to greater energy use, focusing their analysis on responsible banks according to the Johannesburg Stock Exchange (JSE) Socially Responsible Investment (SRI) Index.

Despite the reported findings, the following hypothesis may be stated based on the earlier arguments that women are more sensitive to environmental issues and that their presence contributes to improving the effectiveness of the board of directors: *the presence of women on the board of directors contributes to better environmental performance of the European and North American banking sector.*

3. Sample and Method

3.1. Sample

Our study sample consists of the largest 52 banks in Europe (28 banks) and North America (24 banks) by market capitalization. The sample thereby covers the most polluting regions in the West [32] for the period 2010 to 2018. The selected banks had a market capitalization of more than $10 billion on 3 December 2019, according to Thomson Reuters Eikon [63]. This database has been used as a data source in previous studies (e.g., [16,64]). The criterion of market capitalization was used because Li et al. [43] suggest that companies with greater market capitalization protect the environment to a greater degree, possibly because they have more resources to combat environmental pollution. There are also more data available on listed and large companies. The aforementioned source was used to gather the data for the dependent and independent variables used in this study. The independent variables consist of the variables of interest (gender measures) to address our second research aim, as well as the control variables.

3.2. Dependent Variable

Environmental performance is usually measured by indicators composed of a weighting of environmental items. These scores of environmental performance are typically compiled by large companies, which have access to extensive information on firms' environmental performance. This study follows the approach adopted in previous studies [31,59,65]. The environmental score (EnvSc) is published by Thomson Reuters Eikon [63]. This score takes values between 0 and 100 and gives a score calculated as the weighted sum of the three categories that form this pillar: resource use (20 indicators), emissions (22 indicators), and environmental innovation (19 indicators).

3.3. Independent Variables

The board gender diversity variables chosen for this study are those that have been most widely used in previous environmental and corporate governance studies [29,66]. This choice of variables enabled verification of the robustness of the results given the use of multiple measures (Table 1).

Table 1. Gender diversity measures.

Label	Definition
Dum1	Dummy variable that takes the value 0 if there are no women on the board, and 1 otherwise.
Dum3	Dummy variable that takes the value 0 if there are fewer than three women on the board, and 1 otherwise.
Nwom	Number of women on the board.
Pwom	Proportion of women directors, calculated as the number of women on the board divided by the total number of board members.
Dum30	Dummy variable that takes the value 0 if fewer than 30% of the board members are women, and 1 otherwise.
Dum40	Dummy variable that takes the value 0 if fewer than 40% of the board members are women, and 1 otherwise.
Blau	Index reflecting the diversity of the board of directors. Values range between 0 and 0.5. A value of 0 indicates less diversity, owing to the absence of women on the board. The maximum value of 0.5 is attained when the number of female and male directors is the same. The interpretation of other values of this index depends on their proximity to the two limits of the range [67].

Source: Compiled by the authors.

Dum1 was included to control for differences between banks with no female directors on their board and those with at least one. Some studies have reported that women are more aware of environmental problems and lead to more egalitarian, social, and environmental organizations [64,68].

Dum3 was included because several studies have shown that the presence of at least three women on the board of directors enhances the role of women [58,69]. The reason is that the presence of only one or two women on the board is insufficient to bring about change because their opinion is more likely to be ignored [70]. Similarly, Liu [58] reported that firms with more than three women are sued less often for environmental infringements. However, the impact of a critical mass of women directors on environmental sustainability has received little attention [29].

In view of the previous arguments, the *Nwom* variable was included. It has been observed that environmental performance increases when there are more women on the board of directors [71]. The variable *Pwom* was also included because, in addition to the number of women on the board of directors, the proportion of women on the board is also important. It has been argued that the percentage of women on the board is positively related to environmental performance because women have greater environmental awareness [15,31].

The variables *Dum30* and *Dum40* were also included to control for differences between banks that have a board with, respectively, at least 30% and at least 40% women directors and banks with a proportion of women directors below these thresholds. These variables were included because the threshold of around 30% in the proportion of female directors explains a shift in the trend of environmental performance in the banking sector [29]. Furthermore, the effect of gender diversity on the board of directors should lead to better performance if there is a balanced gender distribution on the board; that is, 40% to 60% of board members are women [72]. To the best of our knowledge, this is the first time that *Dum30* has been used in this stream of literature, and the use of *Dum40* is relatively new in studies of gender and corporate governance [66]. Finally, the *Blau* index was used to measure the gender diversity of the board [67]. Several studies have reported that this index offers a good measure of diversity [14,73].

To improve the specification of the model, six control variables were included. These variables have been linked to environmental performance in previous studies [41,64]. Five are governance variables (*Ndir*, *CEODual*, *CSRCom*, *EnvTra*, *DirBon*) and one is an economic indicator (*SBank*).

Specifically, we selected the size of the board of directors (*Ndir*: number of directors). According to Kaspereit, Lopatta, and Matolcsy [74], it has a positive influence on CSR, thereby confirming its relationship with environmental concern [59]. It was therefore expected that companies with larger boards would have better environmental performance [75]. It was also important to consider CEO duality, which occurs when the same person simultaneously holds the position of CEO and chair of the board of directors (*CEODual*: dummy that takes the value 1 if there is CEO duality, and 0 otherwise). Studies, such as that of Galbreath [76], have shown that companies with CEO non-duality make greater efforts to tackle climate change.

Likewise, we considered whether each bank had a CSR committee (*CSRCom*: dummy that takes the value 1 if such a committee exists, and 0 otherwise). The aim of such a committee is to increase the awareness of employees about the environmental aspects of their work and their responsibility for the reduction of negative impacts on the environment, positively influencing the development of carbon strategies [41]. Furthermore, Orazalin [77] reported that the adoption of CSR committees improves the effectiveness of CSR strategies, leading to improved environmental and social performance. *EnvTra* was also included in the study (dummy that takes the value 1 if there are environmental management training policies, and 0 otherwise) because employee training and development practices condition a company's environmental performance [78].

We considered the existence of bonus policies for responsible practices by board members (*DirBon*: dummy that takes the value 1 if there are bonus policies, and 0 otherwise). Previous studies, such as that of Williams [79], have also examined this variable because an increase in salary is related to meeting sustainability goals [59]. Finally, consistent with the approach of Haque [64], we included

a variable to capture the size of the company in terms of number of employees (*SBank*: annual average number of employees). This variable was log-transformed to reduce the distortions caused by outliers.

3.4. Method

This study has two aims. We describe the procedure in each case. First, to characterize environmental performance, we used descriptive statistics. Common statistics were obtained to arrange and analyze the properties of the data. Regarding the relationship between gender diversity and environmental performance, in line with previous studies [64,74,80], we used panel data to perform the econometric estimation of a linear static equation, which is shown below:

$$EnvSc_{it} = \beta_1 + \beta_2\, Gen_{it} + \beta_3\, Ndir_{it} + \beta_4\, CeoDual_{it} + \beta_5\, CSRCom_{it} + \beta_6\, EnvTra_{it} + \beta_7\, DirBon_{it} + \beta_8\, Sbank_{it} + \eta_i + \varepsilon_{it} \quad (1)$$

Here, *EnvSc* is the environmental indicator, *Gen* denotes each of the seven selected gender measures, *Ndir* refers to the number of directors on the board, *CEODual* is the measure of CEO duality, *CSRCom* indicates whether there is a CSR committee, *EnvTra* indicates whether there are environmental management training policies, *DirBon* indicates whether there are bonus policies for responsible practices, *SBank* is the average number of employees, η_i is the unobservable individual effect, and ε_{it} is the random error term for company *i* in period *t*.

Two procedures can be used to estimate linear static equations with panel data: fixed effects models or random effects models. To determine which should be used, the assumption of absence of correlation between the unobservable individual effect and the explanatory variables must first be verified using the Hausman test. The results of the test are provided for each estimated equation in Table 4 under "*p* value (Hausman: FE/RE)." If this hypothesis of absence of correlation is rejected, then the only consistent estimator is the fixed effects estimator. However, if this hypothesis is not rejected, then both estimators are consistent, the difference being that the random effects estimator is the efficient estimator [81]. Therefore, the decision of which model to use for the analysis in this study was based on the results of the Hausman test. These results show the existence of correlation between the explanatory variables and the unobservable individual effect. Therefore, the results indicate that the fixed effects model should be used because it offers the only consistent estimator.

Crucially, for the fixed-effects estimator to be consistent, it requires the assumption of exogeneity of the explanatory variables to hold [81]. In view of the possible existence of endogeneity in the model due to the simultaneous causality between the dependent and independent variables [31,58], we tested the hypothesis of absence of correlation between the explanatory variables and the error term using the Hausman test. The result is given in Table 4 under "*p* value (Hausman: FEIV/FE)." The results show that the aforementioned assumption of exogeneity holds in all cases. The first lags of the explanatory variables were used as instruments [82].

However, robustness analysis was performed by repeating the estimation of the equation using a random effects model and the generalized least squares estimator. Given that it was also necessary to meet the assumption of exogeneity of the explanatory variables [81], we checked this assumption, providing the results in Table 5 under "*p* value (Hausman: REIV/RE)."

Finally, estimation was performed using a variances-covariance matrix of errors that were robust to heteroscedasticity between individuals and to serial correlation of the errors of the same individual. Time dummies were also included to control for any unobservable factors that could influence the behavior of the dependent variable over time.

4. Results

Tables 2 and 3 provide a general description of the variables for the sample and a comparison of the environmental performance scores at different levels of gender diversity. As Table 2 shows, *EnvSc* has a relatively high value, with an arithmetic mean of 75.43. The standard deviation indicates

low heterogeneity in the data, indicating the reliability of this mean value. The results for the 25th and 50th percentiles show that 75% of the observations of *EnvSc* have a score of more than 70, while 50% have a score of more than 80. Therefore, the vast majority have high scores, given that the maximum score is 100. The highest score is 97.84, and only 25% of the observations have scores above 90 (75th percentile). These data show that most of the analyzed banks have good environmental performance. Thus, in response to our first objective, we can conclude that the European and North American banking sector has a high level of involvement in actions to mitigate the effects of climate change. Similarly, according to Azarkamand et al. [83], companies are increasingly implementing measures to fight against them.

Table 2. Descriptive analysis.

	Arithmetic Mean	Standard Deviation	Minimum	Maximum	25th Percentile	50th Percentile	75th Percentile
EnvSc	75.4311	22.2269	13.57	97.84	70.57	83.95	90.68
Dum1	0.9463	0.2256	0	1	1	1	1
Dum3	0.6699	0.4706	0	1	0	1	1
Nwom	3.5799	1.7641	0	10	2	3.73	5
Pwom	0.2439	0.1224	0	0.6	0.17	0.25	0.33
Dum30	0.3538	0.4786	0	1	0	0	1
Dum40	0.1153	0.3197	0	1	0	0	0
Blau	0.1336	0.1336	0	0.5	0.28	0.38	0.44
Ndir	14.3499	3.5082	5	28	12	14	16
CeoDual	0.4780	0.4780	0	1	0	0	1
CSRCom	0.8170	0.3869	0	1	1	1	1
EnvTra	0.7057	0.4561	0	1	0	1	1
DirBon	0.5308	0.4995	0	1	0	1	1
Sbank	81,059.29	81,017.25	1250	33,012.5	19,960	47,005	105,348.5

Source: Compiled by the authors using Stata 16, StataCorp LLC, Badajoz, España.

Table 3. Descriptive statistics of *EnvSc* based on the value of observations of *Nwom* and *Pwom* with respect to the median values.

	Nwom		***Pwom***	
	***Nwom* < 3.73**	***Nwom* ≥ 3.73**	***Pwom* < 0.25**	***Pwom* ≥ 0.25**
Arithmetic mean	68.66872	82.46675	68.28934	81.30504
Standard deviation	24.31697	17.54534	24.71498	17.97563
Minimum	13.57	13.85	13.57	13.85
Maximum	97.42	97.84	97.42	97.84
25th percentile	49.3	80.735	49.3	79.135
50th percentile	77.24	87.64	77.24	86.735
75th percentile	88.21	92.51	88.3	92.375
Observations	251	252	227	276

Source: Compiled by the authors using Stata 16, StataCorp LLC, Badajoz, España.

We now consider the gender variables. On average, 94.63% of observations in the sample indicate that there is at least one woman on the bank's board of directors (see *Dum1*). This result implies that there are still leading banks with no women on their boards, although this is not generally the case. The average value of *Dum1* is greater than that of *Dum3*. It can therefore be deduced that in some banks with female representation on the board, there are few than three female directors. However, in almost 67% of the observations, there are at least three female directors on the board. As reflected by the 50th percentile, in 50% of cases, the board has at least three women directors.

Moreover, although the average number of women directors is 3.57, the standard deviation reveals heterogeneity in the data, with the *Nwom* variable taking values between 0 and 10. In cases with a value of 0, there are no women on the board, while the maximum number of female directors is 10. The data show that in 75% of the observations, this number is less than 5 (75th percentile).

The low presence of women on the board is further reflected by the fact that the average proportion of women directors is slightly less than 25%. The proportion of women is less than 30% and 40% in most cases, as reflected by *Dum30* and *Dum40*. Therefore, the data reflect the under-representation of women on the boards of directors of the banks in the sample. This finding is also corroborated by the *Blau* index. Despite showing that there is at least gender parity in one company (see maximum value of *Blau*), the average value is 0.1336.

We now consider the other corporate governance variables and the company size indicator (number of employees). On average, the banks have approximately 14 board members. There is little dispersion of the observations around this mean value, with the largest boards comprising 28 members and the smallest consisting of five. The opposite is true of the *Sbank* variable. The values for *SBank* fall within a wide range (1250 to 33,012 employees). This high dispersion, together with the values for the percentiles, indicates the variation of the sampled banks in terms of size. Furthermore, just under 50% of the banks have a CEO who is also the chair of the board. Regarding CSR and the environmental training of the board members, the average values of *CSRCom* and *EnvTra* imply that many banks have a specific CSR committee as well as policies for the training of board members in environmental matters.

Table 3 shows the descriptive statistics for *EnvSc*. The data are shown separately for banks with fewer than 3.73 women directors and those with 3.73 women directors or more. The data are also shown separately for banks with less than 25% women directors and those 25% or more women directors. Here, 3.73 and 25% are the respective median values of *Nwom* and *Pwom* for the sample.

In observations for which the number of women directors or the proportion of women directors is greater than or equal to the respective median value, the environmental performance score is approximately 13 points higher. Specifically, in cases where there are at least 3.73 women directors, the mean environmental performance score is 82.46. If the opposite is true, the score is 68.66. The same occurs with the percentage of women directors. When at least 25% of the board members are women, the dependent variable has a mean value of 81.30. By contrast, when this proportion is lower, the mean value of *EnvSc* is 68.28. The dispersion of observations around the mean value of *EnvSc* is greater in the sub-samples covering the lowest 50% of scores for the diversity measures. Likewise, there is a notable difference (of around 30 points) between the values at the 25th percentile of *EnvSc* for the two subsamples under these two criteria. In each case, the value is much higher for the subsample where the number of women directors and the proportion of women directors is greater than or equal to the median (49.3 vs. 80.73 and 49.3 vs. 79.13, respectively).

Finally, Table 4 shows the fixed effects estimates of the proposed equation. An equation was estimated for each of the seven proposed gender measures. The models were statistically significant at the 99% confidence level in all cases, as reflected by the p value of the F test.

We now consider the results of the regressions shown in Table 4. Regarding the relationship between *EnvSc* and the gender variables, only two of the coefficients associated with these explanatory variables are statistically significant (*Nwom* and *Dum30*). Therefore, the results indicate that none of the following measures results in a better environmental score of the sampled banks: raising the proportion of female directors (*Pwom*), having greater gender parity among directors (*Blau*), increasing the number of women on the board from zero to at least one (*Dum1*), increasing the number of women on the board to at least three (*Dum3*), or having at least 40% female representation on the board (*Dum40*). Our results thus confirm the conclusions of previous studies [60–62].

As shown in Table 2, there is a major gender imbalance on the boards of directors in the sample due to a clear predominance of men. Therefore, the benefits of female representation in the top echelons of these organizations are not apparent because a gender-balanced board is necessary for the role of women to truly influence company policies and performance [72]. This point has already been made by Konrad et al. [70], who argued that the number of women on the board caused the difference between a notable and non-notable effect of the female presence on that board. Those authors based their argument on the fact that only if there are several women on the board will they be able to break

down the predominant gender stereotypes and on the fact that there must be a critical mass of women to change the male-dominated communication dynamic.

Table 4. Dependent variable: *EnvSc*. Fixed effects estimator.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dum1	1.168						
Dum3		0.334					
Nwom			−0.898 **				
Pwom				−10.594			
Dum30					−2.443 *		
Dum40						0.475	
Blau							−9.598
Ndir	0.451 **	0.4503 **	0.570 **	0.395 *	0.387 *	0.455 **	0.402 *
CeoDual	−1.807	−1.745	−1.95	−1.916	−1.707	−1.728	−1.805
CSRCom	5.317*	5.226 *	5.359*	5.333 *	5.560 *	5.211 *	5.188 *
EnvTra	9.407 **	9.381 **	9.457 ***	9.558 ***	9.511***	9.414 **	9.577 ***
DirBon	0.020	−0.011	0.086	0.090	0.002	−0.051	−0.039
Sbank	6.357 ***	6.420 ***	5.753 **	5.875 **	6.279 ***	6.358 ***	5.794 **
Observations	494	494	494	494	494	494	494
R^2 (Within)	0.3614	0.3611	0.3688	0.3653	0.3684	0.3612	0.3648
p value (*F*)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p value (Hausman: FE/RE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p value (Hausman: FEIV/FE)	0.9994	0.7747	0.6946	0.7334	0.7018	0.8316	0.8017

Source: Compiled by the authors using Stata 16, StataCorp LLC, Badajoz, España. *** significant at the 99% level, ** significant at the 95% level, * significant at the 90% level. R^2 (Within): coefficient of determination of the transformed model (within group). *p* value (F): *p* value of the test of model significance. *p* value (Hausman: FE/RE): *p* value of the Hausman test under the null hypothesis of absence of correlation between the explanatory variables and the individual unobservable effect. *p* value (Hausman: FEIV/FE): *p* value of the Hausman test under the null hypothesis of absence of correlation between the explanatory variables and the error term. The time dummies are omitted for brevity and practicality. The estimation was performed with errors that are robust to heteroscedasticity and autocorrelation.

Regarding the statistically significant coefficients (*Nwom* and *Dum30*), the evidence reveals a negative relationship at a confidence level of 95% and 90%, respectively. These results imply that as the number of women on the board of directors increases and female representation reaches at least 30%, the environmental performance score for the studied banking sector worsens. These results do not necessarily imply that women are unaware of environmental risks and are therefore less sensitive to taking environmental action, as confirmed by studies that report a positive relationship between board gender diversity and environmental performance [14,15,43]. The results merely indicate that having women on the board does not positively influence the environmental performance score. This situation may be due to a possible increase in conflict between board members such that, instead of leading to environmentally responsible decision making, this conflict would decrease consensus and therefore lead to poorer performance, as indicated by Bernardi and Threadgill [48].

Finally, to test the robustness of these results, Table 5 shows the estimations using a random effects model. As observed, none of the coefficients associated with the gender explanatory variables is significant. Therefore, the evidence confirms that the female representation on the boards of directors of the analyzed firms does not contribute to explaining their environmental performance.

Consequently, the proposed hypothesis cannot be verified. To conclude, we should stress the positive and significant relationship between the environmental performance score and *EnvTra*, *SBank*, *Ndir*, and *CSRCom*, as reflected by all equations in Tables 4 and 5. These results imply that the environmental performance score improves when environmental management training policies are put in place, the number of employees and directors is increased, and a CSR committee is established.

Table 5. Dependent variable: *EnvSc*. Random effects model.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dum1	2.032						
Dum3		0.937					
Nwom			−0.451				
Pwom				−2.751			
Dum30					−1.455		
Dum40						1.029	
Blau							−2.656
Ndir	0.441 **	0.434 *	0.509 **	0.434 **	0.415 *	0.450 *	0.435 **
CeoDual	−3.993 *	−3.881 *	−4.212 *	−4.165 *	−4.099 *	−4.134 *	−4.077 *
CSRCom	7.576 **	7.438 **	7.757 ***	7.689 **	7.826 ***	7.729 **	7.584 **
EnvTra	10.975 ***	10.931 ***	11.104 ***	11.133 ***	11.145 ***	11.206 ***	11.090 ***
DirBon	0.801	0.751	0.903	0.864	0.832	0.793	0.812
Sbank	5.436 ***	5.548 ***	5.301***	5.335 ***	5.374 ***	5.381 ***	5.366 ***
Observations	494	494	494	494	494	494	494
p value (Wald)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p value (Hausman: REIV/RE)	0.0000	0.3283	0.3437	0.3665	0.2738	0.3842	0.4100

Source: Compiled by the authors using Stata 16, StataCorp LLC, Badajoz, España. *** significant at the 99% level, ** significant at the 95% level, * significant at the 90% level. *p* value (Wald): *p* value of the test of model significance. *p* value (Hausman: REIV/RE): *p* value of the Hausman test under the null hypothesis of absence of correlation between the explanatory variables and the error term. The time dummies are omitted for brevity and practicality. The estimation was performed with errors that are robust to heteroscedasticity and autocorrelation.

5. Conclusions

This study aimed to identify the behavior of the European and North American banking sector in response to climate change. The goal was to determine whether board gender diversity is a differentiating factor among banks with different environmental behavior. This question is highly relevant, given the lack of studies on this topic. To achieve our aims, descriptive statistics and a fixed effects model were used to analyze a sample of the largest European and North American banks in terms of market capitalization.

First, the results show that the analyzed banks generally have high environmental performance scores. This finding reflects the importance with which the sector views this problem. Second, only two of the seven gender measures used in the estimations have statistically significant coefficients, both negative. Similarly, the robustness analysis shows that none of the gender variables has a significant coefficient. Therefore, the results support the negligible effect of a greater presence of women directors on environmental performance scores. However, the literature offers several arguments for the sensitivity of women toward caring for the environment and their greater concern for different stakeholders. Consequently, this finding can be explained by the gender imbalance on the boards of directors of the banks under study, which have a clear under-representation of women. This under-representation of women on the board would imply that the role of women does not influence company policies and performance.

Thus, although the literature suggests that female representation on boards of directors is important for corporate performance, there are still many organizations, such as those in the banking sector, where the presence of women directors is low. This situation is noteworthy given that it is important not only for there to be women on the board but also for women to have a decent level of representation among the directors. Otherwise, a male predominance can prevent exposure to different perspectives provided by women and the positive influence that they can have on the processes and decision making of the board. Therefore, one of the implications of this study is that it reveals the need for a gender balance on the board of directors to ensure that female talent is fully utilized in an organization's decision-making processes. Doing so creates a context that enables women to broaden the perspectives of the board of directors by considering issues that involve different stakeholders and the community, such as protection of the environment.

Finally, it is worth noting this study's limitations. These limitations fundamentally derive from the use of a composite indicator as a dependent variable. When this variable is created as an average of

indicators, the sub-indicators with low values are masked and are offset by those with high values. Other indicators of environmental performance should be used in future studies to provide robustness analysis of the results. An example would be the those related to the SDGs. These indicators that measure commitment to the SDGs could show the level of involvement of banks in achieving these vital global goals, as well as providing evidence of the influence of gender diversity on reaching these goals.

Author Contributions: Conceptualization, C.G-S., Y.F.-T., and M.G.-F.; methodology, C.G.-S., Y.F.-T., and M.G.-F.; software C.G.-S., Y.F.-T., and M.G.-F.; validation, C.G.-S., Y.F.-T., and M.G.-F.; formal analysis, C.G.-S., Y.F.-T., and M.G.-F.; investigation, C.G.-S., Y.F.-T., and M.G.-F.; resources, C.G.-S., Y.F.-T., and M.G.-F.; data curation C.G.-S., Y.F.-T., and M.G.-F.; writing—original draft preparation, C.G.-S., Y.F.-T., and M.G.-F.; writing—review and editing, C.G.-S., Y.F.-T., and M.G.-F.; funding acquisition, C.G.-S., Y.F.-T., and M.G.-F. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Junta of Extremadura and was co-financed by the European Regional Development Fund, grant number GR18124.

Conflicts of Interest: The authors declare no conflict of interest.

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