

The impact of women leaders on environmental performance: Evidence on gender diversity in banks

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Abstract

This study analyses the impact of women leaders on environmental performance in a sample of 96 listed banks in the EMEA (Europe, Middle East and Africa) region from 2011 to 2016. Gender diversity in leadership positions is explored through women in the board of directors, chief executive officer gender, and the interaction between these two aspects. This study sheds light on inconsistent results in prior literature by testing three theoretical perspectives: gender difference, critical mass, and homophily. The main results suggest that there is nonlinear relationship between women directors and the environmental performance of banks and that female chief executive officers play a strategic role in shaping this relationship, by confirming the homophily perspective for the banking sector. Therefore, leader gender diversity is an important driver of environmental sustainability in banks, which are increasingly involved in environmental issues either directly, as companies, or indirectly, through their lending activity.

KEYWORDS

banks, diversity, environmental performance, gender, homophily, leadership

1 | INTRODUCTION

Environmental sustainability, especially in recent years, has become a core issue for academics, regulators, and policy makers. Goal 13 of the Sustainability Development Goals urges the development of actions, at all levels, to contrast climate risks and preserve the environmental ecosystem. Even Pope Bergoglio stated that "climate change is a global problem with grave implications: environmental, social, economic, political and for the distribution of goods. It represents one of the principal challenges facing humanity in our day" (Francis, 2015:20).

Although social performance is generally more relevant to issues in the financial industry, banks are increasingly involved in environmental issues either directly in their "day-to-day" operations, originating physical flows (Lundgren & Catasús, 2000), or indirectly by encouraging their counterparts (such as suppliers, businesses, and households) to adopt eco-friendly initiatives (Thompson, 1998). Banks play a key role in policies aimed at mitigating climate change by ending their

relationships with industries linked to high pollution and by contributing to a more sustainable allocation of capital (HLEG - High-Level Group on Sustainable Finance, 2018). Redirecting investments in this way is strongly desired: "some estimates suggest that at least half of the assets of banks in the Euro area are currently exposed to climate change-related risks" (European Commission, 2018:9). Therefore, environmentally friendly banks should not only be able to enhance operating performance and reduce risk (Gangi, Meles, D'Angelo, & Daniele, 2018; Jo, Kim, & Park, 2015) but also improve their reputation and customer loyalty (Aramburu & Pescador, 2019). In turn, this should help banks lower the consequences of a crisis connected to loss in reputation (Giannarakis & Theotokas, 2011).

To address these concerns, banks are required to integrate new environmental strategies in their policies and decision-making processes. In this context, corporate governance plays a key role: the issue of environmental performance represents an important corporate social responsibility (CSR) topic over which corporate leadership positions may exercise a considerable influence (Rao & Tilt, 2016;

Walls, Berrone, & Phan, 2012). Gender diversity (in leadership) represents one of the most important drivers for environmental sustainability, and Goal 5 of the Sustainability Development Goals states that “gender equality is a necessary foundation for a peaceful, prosperous and sustainable world.” A recent United Nations Environment Programme report specifies that “sustainable adaptation must focus on gender and the role of women if it is to become successful” (Nellemann, Verma, & Hislop, 2011:5).

In the banking sector the role of women is even more important, especially to promote more prudent and sustainable management, following recent bank collapses. Scholars claim that including women on boards is beneficial to banks as it helps mitigate risks and encourages conservative financial decisions (Palvia, Vähämaa, & Vähämaa, 2015). In addition, by promoting women to top positions, banks could provide essential motivation for their entire pool of female employees and strengthen the process of sustainable development.

The different connections between women in leadership positions and environmental sustainability have not yet been investigated thoroughly (Glass, Cook, & Ingersoll, 2016; Kassinis, Panayiotou, Dimou, & Katsifarakis, 2016; Liu, 2018; Walls et al., 2012), especially in the banking sector, where—to the best of our knowledge—existing studies have only partially addressed this issue (Gangi et al., 2018; García-Sánchez, Martínez-Ferrero, & García-Meca, 2018; Khan, 2010). These studies mainly focused on the relationships between female representation on the board and CSR reporting (Khan, 2010) or the environmental commitment of banks (Gangi et al., 2018; García-Sánchez et al., 2018) without analysing the impact a critical mass of women directors might have and the interaction between female directors and female chief executive officers (CEOs).

Our paper aims to fill this gap by analysing the connections between women leaders (in terms of both a critical mass of female directors and female CEOs) and the environmental performance of banks. To test our hypotheses, we use a sample of 96 listed banks in the EMEA (Europe, Middle East, and Africa) region and construct a 6-year panel dataset (from 2011 to 2016) including 401 bank-year observations. The EMEA region represents an interesting area of investigation for several reasons. First, very few studies examine the relationship between gender and sustainability outside the United States or other English-speaking countries (Shoham, Almor, Lee, & Ahammad, 2017). Secondly, over the last two decades, the EMEA region has witnessed increased commitment to addressing gender board diversity with the implementation of diversity and equal opportunity processes in company boardrooms (Sahay et al., 2017). In fact, many countries in this region have taken specific and deliberate actions to reform their governance structure by introducing higher gender quotas (Deloitte, 2016). The EMEA region leads the ranks (over the Americas and Asia Pacific) where women directors hold 20% of the positions on company boards (Chanavat & Ramsden, 2014). Finally, in an international comparison, the EMEA region appears to be characterized by more female leadership positions and a strong public awareness to C-level gender equality (Dawson, Kersley, & Natella, 2016; Weber Shandwick & KRC Research, 2015).

Our findings add several contributions to the literature: it is the first study to investigate the linkage between environmental performance and the various leadership positions held by women in the banking industry. This specific focus is important for two reasons. As environmental performance is industry-sensitive, investigating a homogeneous sample allows for comparisons between institutions that are subject to the same environmental concerns (Cabeza-García, Fernández-Gago, & Nieto, 2017). Banks are an interesting subject of research because they are increasingly involved in environmental issues (Alberici & Querci, 2016). Secondly, we add value to the existing literature by testing Kanter's critical mass theory (Kanter, 1977) for women directors in the banking sector. Following Joecks, Pull, and Vetter (2013) and Ben-Amar, Chang, and McIlkenny (2017), we look for a nonlinear, U-shaped relationship between gender diversity and environmental performance. We intend to endogenously identify the value of the critical mass of women on the board by including a quadratic term of the proportion of female directors on the board. Hence, we compute the turning point in the predicted environmental performance of banks (Frag & Mallin, 2017; Joecks et al., 2013). Finally, we provide a novel application of the homophily theory by arguing that the CEO's gender plays a crucial role in shaping the impact a board's gender diversity has on the environmental performance of banks.

Our results offer an important contribution, shedding light on seemingly inconsistent results in the literature. When banks are led by male CEOs, the relationship between board gender diversity and environmental performance is an inverted U-shape that may indicate the importance of gender balanced boards (Schwartz-Ziv, 2017). Conversely, when banks are led by female CEOs, we find support for both the critical mass theory and the homophily perspective in the banking sector. In other words, our findings reveal that women CEOs empower the critical mass of women on the board to pursue strong environmental initiatives.

This paper is organized as follows. In the next section we review the literature and develop our hypotheses. Then, we specify our research design (sample, data, and methodology) and describe the empirical results. In the last two sections, we discuss our findings and present the conclusions.

2 | LITERATURE REVIEW AND HYPOTHESES

2.1 | Board gender diversity in the banking sector

Following the subprime crisis, bank governance concerns are of increasing interest to scholars and regulators because “effective corporate governance is critical to the proper functioning of the banking sector and the economy as a whole” (BCBS - Basel Committee on Banking Supervision, 2015:3). Of the many governance issues, board gender diversity is one of the most debated in banking literature. The primary objective is to understand what influence female representation on the board has on the financial performance of banks.

Empirical studies testing this issue seem to achieve convergent results. Scholars find a positive correlation between female executives or directors and financial performance (García-Meca, García-Sánchez, & Martínez-Ferrero, 2015; Mateos de Cabo, Gimeno, & Nieto, 2012) or bank stability (Palvia et al., 2015; Sahay et al., 2017). Recent studies have tested for the presence of a nonlinear relationship between board gender diversity and bank financial performance. Farag and Mallin (2017) and Owen and Temesvary (2018), respectively, find that a threshold of women on bank boards increases profitability or reduces financial fragility. It is important to note that these results are based on a different bank sample but suggest that the nonlinear linkage persists regardless of the geographical context. Finally, another stream of research focused on the efficiency level of banks also shows the positive impact of women on the board, especially for small banks (Andrieş, Căpraru, Mínguez-Vera, & Nistor, 2018) and for financial institutions where women are also appointed as independent board directors (Ramly, Chan, Mustapha, & Sapiei, 2015).

In sum, the existing literature on board gender diversity in the banking sector reveals interesting linkages and policy implications, which encourage further investigation. Research on nonfinancial perspectives is still limited as we will see in the following sections documenting the literature on environmental performance.

2.2 | Board gender diversity and environmental sustainability

The gender difference perspective highlights the importance of women on boards in light of developing high corporate environmental performance (Kassinis et al., 2016; Post, Rahman, & Rubow, 2011). This occurs because women display higher levels of environmental concerns (Hur, Kim, & Jang, 2016), are more actively engaged in pro-environment behaviours, and tend to have a better perception of environmental risks (Davidson & Freudenburg, 1996). Moreover, women in politics are more likely than men to support proenvironmental legislation (Mohai & Kershner, 2002).

The gender difference perspective relies on theoretical frameworks such as the Upper Echelon Theory-UET (Hambrick, 2007; Hambrick & Mason, 1984), where each decision maker “brings a cognitive base and values to a decision, which create a screen between the situation and his/her eventual perception of it” (Hambrick & Mason, 1984:195). This close relationship between a leader's traits, such as age and education, and the firm's strategic choices and, hence, organizational outcomes help explain a firm's performance. Taking environmental protection values as an example, the more the top managers share these values, the more likely the firm favours the development of effective environmental practices (Li et al., 2017). Because it can be difficult to measure cognitive, social, and physiological characteristics directly, attention is placed on observable managerial characteristics (e.g., age, tenure in the organization, functional background, education, socioeconomic roots, and financial position). As evidence shows that women and men bring different priorities, perspectives, and values to leadership roles, the cognitive base

inherent in top management teams also depends, among other things, on how many women are present (Byron & Post, 2016; Post & Byron, 2015). Therefore, environmental policies may be influenced, in part, by gender diversity: the presence of women on the board and CEO gender may impact the environmental outcomes. Similarly, a gender difference perspective can be rooted in gender socialization theory, which states that socialization encourages and rewards men and women for different behaviours: individualistic and competitive behaviours in men over cooperative and altruistic behaviours in women (Chodrow, 1974; Gilligan, 1982). These different social roles and expectations give rise to career paths and leadership styles that depend on the gender of leaders. As a result, women tend towards more participative and relationship-building approaches in leadership roles and are more likely to pursue long-term strategies and stakeholder-focused outcomes, which are instrumental to successful environmental practices (Glass et al., 2016; Glass & Cook, 2017; Matsa & Miller, 2013).

Empirical evidence reveals the proenvironmental behaviour by women. Investigating a sample of Fortune 500 companies from different industry sectors, Ciocirlan and Pettersson (2012) report that companies with more female employees exhibit higher apprehension for climate change. Similar results arise when numerical diversity (i.e. the percentage of women on the board of directors) is replaced by a more “structural” view of gender diversity. In this case, Kassinis et al. (2016), again analysing a sample of U.S. companies belonging to a wide range of industries, found that the firms more focused on environmental issues are also characterized by more conscious gender policies. More specifically: “it is not only gender diversity on the board that matters for sustainability but diversity throughout the organization” (Kassinis et al., 2016: 408). Additionally, the positive impact of gender diversity on environmental concerns seems to be stronger when environmental pollution is greater. According to Li et al. (2017: 306): “the more likely firms in a given industry are to cause environmental pollution, the more salient will be the beneficial effect of gender diversity on boards on firms' environmental policy in the industry”. Like Ciocirlan and Pettersson (2012) and Kassinis et al. (2016), Li et al. (2017) also based their research on a large sample of nonfinancial firms listed in the United States. Jiang and Akbar (2018), using a sample of listed Chinese nonfinancial firms, found similar results: the higher the proportion of female directors on the board, the greater the company's environmental investments. Shoham et al. (2017), on the other hand, used a cross-country sample of companies for multiple years and industries. They found that the presence of even one woman on the board of directors positively encourages organizations toward environmental sustainability, regardless of the local culture. Others have examined the relationship between the proportion of female directors on the board and the level of environmental disclosure (Rao, Tilt, & Lester, 2012; Rupley, Brown, & Marshall, 2012), or the propensity to reveal information on greenhouse gas emissions (Liao, Luo, & Tang, 2015). Again, the relationship is positive for the area investigated, which are primarily Anglo-Saxon countries and nonfinancial firms.

Finally, to the best of our knowledge, only Deschênes, Rojas, Boubacar, Prud'homme, and Ouedraogo (2015), Gangi et al. (2018),

and García-Sánchez et al. (2018) provide empirical evidence on the banking sector. All these studies showed that a larger proportion of female directors indicate greater consideration for environment-related issues. This linkage did not seem to be affected by differences at the country level: indeed, while Deschênes et al. (2015) focused only on Canada, García-Sánchez et al. (2018) and Gangi et al. (2018) carried out a multicountry investigation.

Some studies found the opposite. Glass et al. (2016) revealed that the positive influence of board gender diversity on environmental initiatives is very limited, and Deschênes et al. (2015) found that the presence of women on the board of directors is associated with a lower environmental performance score in nonfinancial firms. Other studies found that the linkage between environmental strengths (Walls et al., 2012) or disclosure (Galbreath, 2011) and the presence of female directors is not significant. All these studies focused on companies belonging to English-speaking countries and multiple industries. However, similar results are also found by Triresani and Djajadikerta (2016), based on 38 companies from a single sector (mining) and listed in an emerging economy (Indonesia Stock Exchange).

Apart from region and industry effects, a possible explanation for these varying results might be the presence of a nonlinear relationship between female participation on boards and environmental performance (Owen & Temesvary, 2018). A common feature to all the studies mentioned above is the inclusion of the percentage of female directors on the board as an explanatory variable without including the square of this variable to allow for a curvilinear link. In other words, it may be possible that increasing the number of women on the board has an opposite influence on environmental policies, depending on whether only a few or many women had already been appointed.

2.3 | Critical mass theory and environmental impact

Our research model also tests the theoretical framework based on Kanter's (1977) work concerning gender diversity in group dynamics and processes-critical mass theory. Following the logic of Kanter, only when there is a consistent or significant minority of women in a group, namely, a threshold or critical mass, women will be able to provide new perspectives, abilities, and skills and hence positively influence group culture and performance. Based on the critical mass theory, some studies (Konrad, Kramer, & Erkut, 2008; Kramer, Konrad, & Erkut, 2006) found that an absolute number of at least three women on the board is necessary before significant power can be exerted over board activity and substantially change the dynamics and the processes within the board. In sum, the benefits of having women on a corporate board are more likely to be realized when three or more women are present on a board.

In spite of its wide use in legislative and political research (Childs & Krook, 2008), Kanter's theory has rarely been tested in business environments and little research has been conducted for the purpose of establishing a critical mass. Among these studies, Fernández-Feijoo, Romero, and Ruiz-Blanco (2014), using data from a survey performed

by KPMG on firms from 22 countries and controlling for several country and industry characteristics (cultural factors, existence of regulation on CSR disclosure, the level of law enforcement in the country, and the GDP), argued that companies in countries where a higher proportion of boards of directors count at least three women, the level of CSR reporting is higher. This threshold was also applied by Cabeza-García et al. (2017), on a sample of nonfinancial firms listed in Spain, finding that the presence of a critical mass of at least three women on the board and among the outside and independent directors, leads to better CSR disclosure by firms. Concerning environmental performance, Post et al. (2011) showed that boards, from a sample of 78 Fortune 1000 companies, that are made up of three or more female directors present higher Kinder, Lydenberg, Domini (KLD) ratings in the environmental strengths areas. Similarly, Liu (2018), focusing on a large sample of U.S. firms, found that firms with three or more women on the board experience significantly fewer environmental lawsuits. The findings by Shoham et al. (2017) also support the critical mass theory, based on their cross-country investigation for multiple years and industries. Yet again, they observed that company attitude regarding environmental sustainability becomes stronger on boards that are served by more than three women directors. Finally, also environmental disclosure seems to be influenced by the presence of a critical mass of women directors (Ben-Amar et al., 2017). To operationalize the impact of a critical mass of women, all these studies adopted a dummy variable that equals 1 if there are at least three women sitting on the board of directors and zero otherwise (Jia & Zhang, 2013).

In the banking sector, to the best of our knowledge, the studies analysing the critical mass of female directors mainly focused on bank vulnerability to financial crisis (Frag & Mallin, 2017) or on financial performance (Owen & Temesvary, 2018) and not on the banks' environmental performance. Therefore, we move forward from this evidence, concentrating on the critical mass theory for the banking sector to advance the following hypothesis:

H1. *A critical mass of women on the board of directors has a positive impact on the environmental performance of banks.*

2.4 | Women CEOs and environmental performance

Based on the gender difference perspective, several scholars have predicted that the presence of women CEOs affects business policies and firm strategies. More specifically, women leaders are estimated to be less hierarchical, more innovative, and more inclined to adopt a "people-based" style. However, there are still very few studies on this topic and, more importantly, the results are not clear-cut (Hoobler, Masterson, Nkomo, & Michel, 2018). For example, although Glass et al. (2016), using a large sample of U.S. firms from all industries, did not find evidence that women CEOs provide greater support to corporate environmental policies expressed through the KLD data, other studies provide opposite evidence. Among these, Liu (2018), analysing a large sample of U.S. firms, showed that female CEOs

are significantly associated with reduced environmental lawsuits, although only in firms with an overall lower level of female representation on boards. Similarly, Manner (2010), based on a sample of 650 U.S. public firms, highlighted that a female CEO positively affects the firm's CSR performance, as measured through the strengths categories of KLD ratings. Finally, Jiang and Akbar (2018), using data from 359 Chinese listed companies, found that women executives (CEO or Chair) make significantly higher investments in environmental protection. In line with these studies other scholars report similar linkages in firms belonging to multiple countries and industries (Borghesi, Houston, & Naranjo, 2014; Huang, 2013). Applying the rating results from major CSR ranking agencies, Huang (2013) found that a female CEO affects a firm's CSR performance in a sample of 487 international firms. Likewise, Borghesi et al. (2014), employing all data from KLD Research and Analytics, found two complementary outcomes: on the one hand, the group of higher CSR firms is more likely to have a female CEO; on the other hand, female CEOs are significantly inclined to make socially responsible investments.

Further studies, although not focusing on CSR strategies, document other important and indirect effects of CEO gender on CSR performance across all countries and industries. For example, Vähämaa (2017), focusing on U.S. companies, showed that firms with female CEOs and chief financial officers have higher quality governance practices and takeover defence mechanisms. Moreover, Faccio, Marchica, and Mura (2016), using a large sample from 18 European countries, reported that firms run by female CEOs have lower leverage, less volatile earnings and tend to make less risky investment choices, and Dawson et al. (2016), carrying out a world-wide analysis, suggest that companies with female CEOs have higher profitability and better stock price performance than companies with male CEOs. Finally, Luo, Huang, Li, and Lin (2018), using a dataset of Chinese listed firms, showed that firms with women CEOs enjoy lower bank loan prices because they are usually perceived as more ethical and risk averse compared to firms with men CEOs.

On the whole, these studies suggest that female CEOs are expected to exercise a positive influence on CSR performance, because they are perceived to be risk averse (Faccio et al., 2016), more interested in long-term strategies compared to their male counterparts (Glass & Cook, 2017), environmentally sensitive, and stakeholder focused (Glass et al., 2016).

Recent studies also seem to confirm these outcomes in the financial sector. Indeed, Strøm, D'Espallier, and Mersland (2014) showed that financial performance is better in microfinance institutions led by a female CEO (or chairman of the board). Palvia et al. (2015) find strong evidence that female-led banks hold higher levels of capital and promote more conservative and less risky financial decisions. Based on the positive linkage between sustainability and low riskiness (Karl, 2015), we also expect that women CEOs in banks may have a positive influence on environmental outcomes. This should be true especially in the post-subprime period, when a strong commitment to more sustainable and ethical conduct has been recommended by regulators and policy makers worldwide. Thus, we predict the following second research hypothesis:

H2. *Women CEOs have a positive impact on the environmental performance of banks.*

2.5 | Gender homophily and environmental policies

To investigate the joint impact on environmental outcomes of female CEOs and women on the board after a critical mass is reached, we introduce the homophily perspective, meaning the tendency of individuals to associate with similar others. This affinity emerges in different characteristics: from educational backgrounds to gender, age, and social status. Literature confirms that homophily affects social ties and configures the multiple social systems to which individuals belong: people who share common features or values are likely to establish stronger social relations (Berger, Kick, Koetter, & Schaeck, 2013). This result is very important especially when individuals belong to a social minority within organizations (Kanter, 1977). In this case, social affinities may overcome distrust and lack of support toward a team's minority members. In sum, homophily and social ties facilitate collaboration, cohesion, and commitment especially when tasks are complex and outcomes are uncertain (Glass & Cook, 2017).

To date, few scholars have empirically investigated the effects of gender homophily, especially on CSR and/or environmental performance. Existing studies primarily cover the United States and include multiple industries (Bell, 2005; Glass et al., 2016; Glass & Cook, 2017; Liu, 2018; Tate & Yang, 2015). Among these, Liu (2018), employing a sample of S&P1500 constituents, show that firms with female CEOs are also more likely to have greater female board representation. Additionally, Bell (2005), using data from Standard and Poor's ExecuComp, found that women executives working in women-led firms not only benefit from higher total remuneration than women working in other firms, but they are also more likely to be in the highest management positions. Similarly, Tate and Yang (2015), using data from the U.S. Census Bureau, document that firms led by women tend to have a smaller gender wage gap, indicating that women in leadership positions are likely to cultivate a more women-friendly culture. Finally, Glass and Cook (2017) also find very interesting results, based on all Fortune 500 companies. They highlight that interaction between women CEOs and influential women on the board (i.e., women directors who are also board members of other organizations) allows a company to achieve better corporate governance. Similar results are found even when the analysis focuses only on environmental outcomes: firms with women CEOs and women interlinked board members are less likely than other firms to suffer from environmental concerns (Glass et al., 2016).

Likewise, with regard to the banking sector, Berger et al. (2013), focusing on German financial institutions, show that gender-based affinity positively impacts on corporate governance. More specifically, they document that the presence of female executives on the bank's board increases the probability of appointing another female outside member. Overall, in the banking sector "gender ties among women can mitigate gender-induced entry barriers" (Berger et al., 2013: 2094). Similarly, Berger, Kick, and Schaeck (2014), relying on German

banking sector, indicates that “women are more likely to be appointed to executive boards that are chaired by a female CEO” (Berger et al., 2014:61). For these reasons, we test the gender homophily perspective on the critical mass of women on boards and women CEOs, by advancing the third and last research hypothesis:

H3. *A critical mass of women on the board of directors has a more positive impact on the environmental performance of banks when banks are led by female CEOs.*

3 | RESEARCH DESIGN

3.1 | Sample and data collection

Our sample comprises 96 listed banks in the EMEA region for which data on environmental performance were available on the date of analysis. For all years of analysis and in terms of total assets, our sample represents an average of about 80% of all listed banks belonging to the EMEA region. We constructed a 6-year panel dataset (from 2011 to 2016, the last year available in our data sources) including 401 bank-year observations.

Data on environmental performance and corporate governance (women on the board of directors, board size and CSR sustainability committee) came from Thomson Reuters Asset4 database, which has been used in recent studies (e.g., Helfaya & Moussa, 2017; Kassinis et al., 2016; Pätäri, Jantunen, Kyläheiko, & Sandström, 2012). Information on CEOs and bank-specific financial data (total assets, profitability, and leverage) were collected from Thomson Reuters Datastream, and country variables were collected from several sources: we used the World Bank's country classification by income level, the World Bank's strength of investor protection index, the World Economic Forum's Global Gender Gap Indices, and, finally, the MSCI ESG Research for gender quotas.

3.2 | Dependent variable

To test our hypotheses, we used data on environmental performance (ENV SCORE) from Asset4. The ENV SCORE comprises three category scores: “emission reduction,” “resource reduction,” and “product innovation.” These scores measure respectively a company's capacity to reduce environmental emissions, to implement efficient use of natural resources in the production processes, and to support the research and development of eco-efficient products and services. Each category score is the equally weighted sum of all the indicators used to create it: the indicators and the weight are, respectively, 22 and 12% for emission reduction, 19 and 11% for resource reduction, and 20 and 11% for product innovation. ENV SCORE captures the two dimensions of environmental activities carried out by banks with their involvement in environmental issues either directly, through their operational practices, or indirectly, through the products and services they offer (Alberici & Querci, 2016; Gangi et al., 2018).

3.3 | Independent variables

The independent variables of interest included in our econometric models are the share of women on the board of directors (Cucari, De Falco, & Orlando, 2018; Glass et al., 2016) and the CEO gender (Glass et al., 2016; Huang, 2013). In some models, a dummy variable indicating a critical mass of women (three or more women) is added (Cabeza-García et al., 2017; Fernández-Feijoo et al., 2014; Post et al., 2011).

To avoid model misspecification, we control for additional variables that could influence ENV SCORE. According to prior literature, we identify several widely studied control variables. Concerning bank-specific variables, we control for board size, which may have opposite effects: indeed, large boards are hindered by escalating disorganization, but at the same time they benefit from more resources, greater information, and wider collective expertise (Post et al., 2011). We also control for the existence of a CSR sustainability committee because firms that have such committees are more inclined to promote environmental sustainability (Cucari et al., 2018; Helfaya & Moussa, 2017; Hussain, Rigoni, & Orij, 2018). We control for the effect of bank size: large firms should be more concerned about their social and environmental policies because they tend to be more visible to the public and because larger entities have more resources available for sustainability activities than smaller ones (Alberici & Querci, 2016; Cornett, Erhemjams, & Tehranian, 2016; Kiliç, Kuzey, & Uyar, 2015). We also consider the variable profitability measured by return on assets suitable for inclusion: profitable firms are likely to invest in sustainability activities (Hussain et al., 2018), though some studies find no association (Alazzani, Hassanein, & Aljanadi, 2017; Alberici & Querci, 2016) or a negative link (Andrikopoulos & Kriklani, 2013) between profitability and the level of environmental performance/disclosure. The last bank-specific control variable is leverage: firms experiencing high leverage have fewer possibilities to allocate funds for sustainability activities (Andrikopoulos & Kriklani, 2013). Finally, we also select four control country-specific variables. The first is country income: richer countries might have higher stakeholders demand for sustainability policies and disclosure (Fernández-Feijoo et al., 2014). However, other scholars (Hu & Scholtens, 2014) find a negative relation and argue that the higher the income, the greater the consumption, the greater the bank loans and therefore the more limited the resources allocated to social and environmental policies. As other country control variables, we use the strength of investor protection index because shareholder protection measures are likely to urge boards towards considering and integrating the different board member views and values on sustainability in their decision-making process (Byron & Post, 2016); the Global Gender Gap Index, because intraboard gender power distribution will be more balanced in countries where gender parity is higher, so women and their social and environmental values will have more voice in the strategic decision-making processes (Byron & Post, 2016; Fernández-Feijoo et al., 2014); finally, gender quotas, which may increase attention on sustainability issues by placing more women on the boards, but at the same time may have the opposite effect because “It is necessary to move

beyond superficial accounts and take better account of ‘who the women are’” (Huse, 2018:1).

Table 1 shows a summary of the measurement of all variables and the expected relationship that emerges from the prevailing literature.

Tables 2 and 3, respectively, present the descriptive statistics and the correlations between the variables used in our study.

Potentially ranging between 0 and 100%, ENV SCORE shows a mean value equal to 67.9%. The average number of women on the board of directors is 17.7%, which shows a low presence. Banks have high variability in terms of size measured by total assets. The minimum value of ROA is negative, highlighting the drop in economic performance many banks endured after the outbreak of the financial crisis. Finally, the variables MASS, CEO WOMAN, CSR COM, HIGH INCOME, and GEND QUOTA are dummy variables.

The correlation matrix (Table 3) highlights very important relationships between the main variables of our study. More specifically, the correlation coefficients demonstrate that the environmental performance of banks is significantly and positively associated with the presence of women on the board and that banks with larger boards, with a CSR committee, and with a larger size by total assets tend to report superior environmental outcomes. Because the correlation coefficients reported in the correlation matrix (Table 3) are less than 0.5 (with the only foreseeable exception of WOMEN BOD with MASS, but still at a safe level of 0.74), there are no multicollinearity concerns in our models. This circumstance is also confirmed by

the VIF test computed on the pooled OLS version of our models (the results are available upon request).

Table 4 shows the means of ENV SCORE and the explanatory variables in the two subsamples identified by the CEO gender. Interestingly, women CEOs are associated with more gender-balanced boards, and with lower income and more gender equal countries. Therefore, banks with women CEOs are more oriented towards appointing women on boards, which demonstrates their attention to supporting women in the various leadership positions. This condition may be associated with social similarity processes that drive board member selection (Burgess & Tharenou, 2002; Burke, 1997). In addition, the presence of women CEOs is higher in countries with high gender parity, therefore where women have higher education, knowledge, and skills, and—contrary to common perceptions—also in low-income countries.

3.4 | Methodology

The next section will test our hypotheses using panel data analysis in order to control for omitted/unobserved variable bias. In particular, random effects panel regression models are presented. The choice of random effects (with respect to fixed effects) models relies on the results of the tests run on all the specifications presented, which were insignificant for the Hausman tests and significant for the Breusch and

TABLE 1 Independent variables

Name of variable (Acronym)	Measurement	Expected relationship with ENV SCORE
<i>Bank-level variables</i>		
Women on the board of directors (WOMEN BOD)	Total number of women on the board of directors (less the CEO, if applicable) divided by the total number of board members	Non-linear
Critical mass of women (MASS)	Dummy variable that is equal to 1 if boards have at least three women, 0 otherwise	Positive
CEO woman (CEO WOMAN)	Dummy variable that is equal to 1 if the CEO is a woman, 0 otherwise	Positive
Board size (BOARD SIZE)	Total number of directors on the bank's board	Positive/Negative
CSR sustainability committee (CSR COM)	Dummy variable that is equal to 1 if the bank has a CSR sustainability committee, 0 otherwise	Positive
Bank size (BANK SIZE)	Total assets (Euro) of the bank	Positive
Return on Assets (ROA)	Net income as percentage of total assets	Positive/Negative
Leverage (LEVERAGE)	Tier 1 Capital as percentage of total assets (proxy for the Basel 3 leverage ratio)	Positive
<i>Country-level variables</i>		
High income countries (HIGH INCOME)	Dummy variable that is equal to 1 if the country is a country with high income, 0 with low and middle income	Positive/Negative
Strength of investor protection index (INV PROT)	Investor protection in terms of transparency of related-party transactions, liability for director self-dealing, and ease of shareholder suits for director misconduct. This score ranges from 0 (no protection) to 10 (maximum protection).	Positive
Global Gender Gap Index (GEND GAP)	Country gender equality in terms of economic participation, educational attainment, health and survival, and political empowerment. This score ranges from 0 (no equality) to 1 (equality).	Positive
Gender quota (GEND QUOTA)	Dummy variable that is equal to 1 if the country has established quotas for female representation on boards of directors, 0 otherwise.	Positive/Negative

TABLE 2 Descriptive statistics

Variable	Mean	Standard deviation	Minimum	Maximum
ENV SCORE	0.679	0.295	0.023	0.966
WOMEN BOD	0.177	0.123	0	0.540
MASS	0.464	0.499	0	1
CEO WOMAN	0.080	0.271	0	1
BOARD SIZE	13.990	5.181	3	30
CSR COM	0.706	0.456	0	1
BANK SIZE	271,900,000	455,500,000	1,761,000	2,211,000,000
ROA	0.009	0.015	-0.108	0.095
LEVERAGE	0.084	0.127	0	1.886
HIGH INCOME	0.848	0.360	0	1
INV PROT	6.037	1.237	3	8.3
GEND GAP	0.719	0.056	0.593	0.850
GEND QUOTA	0.359	0.480	0	1

TABLE 3 Correlation matrix

Variable	ENV SCORE	WOMEN BOD	MASS	CEO WOMAN	BOARD SIZE	CSR COM	BANK SIZE	ROA	LEV	HIGH INCOME	INV PROT	GEND GAP	GEND QUOTA
ENV SCORE	1												
WOMEN BOD	0.44***	1											
MASS	0.40***	0.74***	1										
CEO WOMAN	0.08	0.20***	0.08	1									
BOARD SIZE	0.30***	0.13***	0.43***	-0.11**	1								
CSR COM	0.48***	0.22***	0.19***	0.07	0.18***	1							
BANK SIZE	0.40***	0.47***	0.42***	-0.06	0.20***	0.30***	1						
ROA	-0.22***	-0.002	-0.07	0.07	-0.22***	-0.04	-0.14***	1					
LEVERAGE	-0.04	-0.05	-0.07	-0.01	-0.11**	0.02	-0.16***	0.31***	1				
HIGH INCOME	-0.01	0.18***	0.14***	-0.11**	0.15***	-0.03	0.20***	-0.45***	-0.18***	1			
INV PROT	0.09*	0.19***	0.18***	0.20***	-0.06	0.07	0.06	0.15***	0.20***	-0.04	1		
GEND GAP	0.18***	0.43***	0.21***	0.14***	-0.08	0.14***	0.22***	-0.12**	-0.05	0.48***	0.19***	1	
GEND QUOTA	0.10**	0.13***	0.20***	0.03	0.12**	0.06	0.19***	-0.07	-0.12**	-0.09*	-0.05	-0.15***	1

Note. Significant correlation coefficients are indicated by the usual significance levels:

***1%. **5%. *10%.

Pagan Lagrangian multiplier tests: in this case, random effects are preferable because they are both consistent and efficient (Baltagi, 2011). In all the model specifications, the dependent variable is ENV SCORE and all the explanatory variables are lagged by 1 year. Natural logarithmic transformations of the two numerical (nonindex) variables (BOARD SIZE and BANK SIZE) are used to better approximate a normal distribution and overcome a possible problem of heteroskedasticity. Finally, robust standard errors of the estimated coefficients are clustered at the bank level and all models are with year dummies and a constant included.

The estimation methodology employed in Table 5 controls for bank-level effects and considers lagged independent variables, thus diminishing the likelihood of endogeneity (Liu, 2018). To be completely sure about the results presented, in robustness analyses not reported for brevity but available upon request, the two-stage least-squares random-effects methodology was used. We adopt a large group of instrumental variables from the Thomson Reuters Database. The first instrument considered is the average overall attendance percentage of board meetings, because scholars have suggested the attendance of directors positively correlates with the number of

TABLE 4 ENV SCORE and explanatory variables means by CEO gender

Variable	ENV SCORE	WOMEN BOD	MASS	BOARD SIZE	CSR COM	BANK SIZE	ROA	LEVERAGE	HIGH INCOME	INV PROT	GEND GAP	GEND QUOTA
Man CEO	0.672	0.170	0.453	14.152	0.696	279,000,000	0.009	0.084	0.859	5.964	0.716	0.355
Woman CEO	0.757	0.260***	0.594	12.125**	0.813	186,000,000	0.012	0.082	0.719**	6.878***	0.745***	0.406

Note. The results of *t* test of differences in the means are indicated by the usual significance levels:

Abbreviations: BOARD SIZE, board size; BANK SIZE, bank size; CEO, chief executive officer; CSR, corporate social responsibility; CSR COM, CSR sustainability committee; ENV SCORE, environmental performance; GEND GAP, Global Gender Gap Index; GEND QUOTA, gender quota; HIGH INCOME, high-income countries; INV PROT, strength of investor protection index; LEVERAGE, leverage; MASS, critical mass of women; ROA, return on assets; WOMEN BOD, women on the board of directors.

***1%. **5%. *10%.

women on the board (Adams & Ferreira, 2009). The second instrument used is the log of the board member compensation, because scholars assert female executives are paid significantly less than their male counterparts (Carter, Franco, & Gine, 2017). In countries where women and men have similar earnings, there is a more equitable playing field and women are more likely to gain board positions (Terjesen & Singh, 2008). Finally, the other instruments implemented are dummy variables indicating whether the bank has a work-life balance policy, implements a policy to drive diversity and equal opportunity, promotes positive discrimination, provides flexible working hours, and provides day care services for its employees. All these variables capture an environment which is more prone to gender diversity in boardrooms. The model estimations by the two-stage procedure were reassuring. Albeit with standard error inflated for some predictors, the main results concerning the significant concavities of the relationship between WOMEN BOD and ENV SCORE were soundly confirmed when residual endogeneity was taken into account.

In line with Halkos and Polemis (2017), bank-level interpolation was used with our dataset, when appropriate in cases of missing values. Logistic and natural logarithmic smoothing techniques were applied to predict the missing values of unitary indices and all the other positive variables, respectively. All the main results of the paper, however, are robust to not using this procedure.

4 | RESULTS

Table 5 shows the estimation results, which address our hypotheses concerning the impact of women leaders (members of the board of directors and CEOs) and of gender homophily on the environmental performance of banks.

In Model A, WOMEN BOD is not significant thus highlighting the possibility of a nonlinear relationship between gender diversity on the board and ENV SCORE. For this reason, Models B and C address the nonlinearity of this relationship. Model B adds a dummy variable signalling if boards have at least three women (MASS, alone and interacted with WOMEN BOD). Instead, Model C adds the quadratic term of WOMEN BOD in order to endogenously determine the threshold level after which women on the board exert an effect on environmental performance with an opposite sign. In Model B, the coefficient of WOMEN BOD is positively significant at the 5% level,

but the sum of the coefficients of WOMEN BOD and of MASS X WOMEN BOD is not significant at any conventional level (point estimate 0.015 with standard error 0.147). This result highlights that introducing women on a board starts to exert a positive effect on environmental performance, but once the critical mass of three women is reached an increasing share of women on the board stops increasing ENV SCORE. Hence, Hypothesis 1 does not seem to be confirmed in general: even though the relationship between board gender diversity and the environmental performance of banks is confirmed as nonlinear, Model B is not compatible with a positive effect of a mass of women on the board and with a U-shaped relationship. Model C, in which nonlinearity is investigated by considering WOMEN BOD also in its quadratic term, uncovers, on the other hand, an inverted U-shaped relationship.

Hypothesis 2 predicts that female CEOs are positively associated with the environmental performance of banks. In the first three models, our empirical analysis does not seem to confirm this hypothesis. CEO WOMAN is not significant at any conventional level. In Model D, CEO WOMAN is interacted with WOMEN BOD, both with the linear and the quadratic term. When interactions are involved, the final sign of the effect of a predictor is not immediately legible from an estimation table. The average marginal effect of CEO WOMAN is computed as change in the linear prediction of ENV SCORE for a discrete change of the dummy variable. Because the difference is positive and significant at 5% (point estimate 0.108 with standard error 0.048), the effect of a woman CEO is ultimately positive in terms of environmental performance. Therefore, Hypothesis 2 seems confirmed when relevant interactions are taken into account.

Hypothesis 3 predicts that a critical mass of women on the board of directors has a more positive impact on the environmental performance of banks when banks are led by female CEOs. To investigate this hypothesis, we have to be able to read the effect of high values of WOMEN BOD on ENV SCORE, differentiated by the CEO gender. Obtained by Model D, Figure 1 plots ENV SCORE prediction and its confidence interval as a function of WOMEN BOD for the average bank-year. The two panels clearly show that in the two subsamples identified by the CEO gender, the effect of WOMEN BOD changes the concavity: inverted U-shaped for a male CEO, U-shaped for a female CEO, with a threshold value of around 30%. Because a female CEO definitively increases the slope of the right branch of the curve, we can confirm Hypothesis 3.

TABLE 5 Random effects panel regression models of the environmental performance of banks (ENV SCORE)

Model	(A) Coefficient (Robust SE)	(B) Coefficient (Robust SE)	(C) Coefficient (Robust SE)	(D) Coefficient (Robust SE)
<i>Bank-level variables</i>				
WOMEN BOD (lag)	0.235 (0.159)	0.819** (0.344)	0.946** (0.442)	1.088** (0.459)
MASS (lag)		0.078 (0.052)		
MASS (lag) × WOMEN BOD (lag)		-0.805** (0.348)		
WOMEN BOD ² (lag)			-1.732** (0.807)	-2.101** (0.858)
CEO WOMAN (lag)	0.020 (0.045)	0.005 (0.049)	0.017 (0.042)	0.385*** (0.128)
CEO WOMAN (lag) X WOMEN BOD (lag)				-2.897*** (0.800)
CEO WOMAN (lag) X WOMEN BOD ² (lag)				5.067*** (1.216)
BOARD SIZE (lag, log)	0.156** (0.064)	0.143** (0.063)	0.131** (0.064)	0.125* (0.065)
CSR COM (lag)	0.099* (0.053)	0.095** (0.048)	0.095* (0.051)	0.095* (0.050)
SIZE (lag, log)	0.092*** (0.017)	0.099*** (0.017)	0.095*** (0.016)	0.096*** (0.017)
ROA (lag)	-1.748*** (0.662)	-1.940*** (0.708)	-1.738*** (0.672)	-1.752*** (0.676)
LEVERAGE (lag)	0.193** (0.082)	0.180* (0.094)	0.176** (0.081)	0.172** (0.078)
<i>Country-level variables</i>				
HIGH INCOME (lag)	-0.145*** (0.042)	-0.144*** (0.043)	-0.146*** (0.042)	-0.142*** (0.043)
INV PROT (lag)	-0.002 (0.010)	0.0003 (0.0097)	-0.002 (0.010)	-0.002 (0.010)
GEND GAP (lag)	0.210 (0.377)	0.100 (0.375)	0.197 (0.368)	0.197 (0.363)
GEND QUOTA (lag)	-0.040 (0.029)	-0.037 (0.028)	-0.043 (0.030)	-0.051* (0.030)
Observations	401	401	401	401
Groups	96	96	96	96
Year dummies χ^2	34.69***	36.10***	34.16***	34.94***
Regression χ^2	166.41***	195.30***	171.50***	197.86***

Note. In all the model specifications: year dummies and a constant are included (not reported for brevity); Hausman tests are not (5%) significant discarding the fixed effect (within) regression (Model A only marginally significant); Breusch and Pagan Lagrangian multiplier tests for random effects are (1%) significant; robust standard errors, reported in parentheses, are clustered at the bank level.

Abbreviations: BOARD SIZE, board size; BANK SIZE, bank size; CEO WOMAN, CEO woman; CSR, corporate social responsibility; CSR COM, CSR sustainability committee; ENV SCORE, environmental performance; GEND GAP, Global Gender Gap Index; GEND QUOTA, gender quota; HIGH INCOME, high-income countries; INV PROT, strength of investor protection index; LEVERAGE, leverage; MASS, critical mass of women; ROA, return on assets; WOMEN BOD, women on the board of directors.

***1% refer to reported coefficients statistically different from zero.

**5% refer to reported coefficients statistically different from zero.

*10% refer to reported coefficients statistically different from zero.

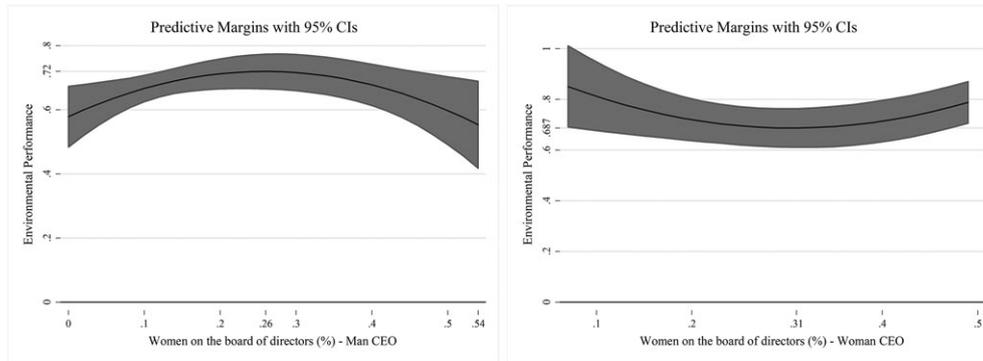


FIGURE 1 Predictions and confidence intervals by Model D

The bank-level control variables also influence environmental performance. Board size, the existence of a CSR sustainability committee, bank size, and leverage have significant positive coefficients in all the models. On the contrary, ROA always has a negative influence, showing a negative relation between profitability and environmental activities: this finding is probably due to the fact that profitable banks are discouraged from seeking legitimacy through environmental practices (Andrikopoulos & Kriklani, 2013). Among the country-level variables, only high income is statistically and negatively significant in all the models. Hu and Scholtens (2014) also found this negative relation and offered this explanation: the higher the income, the greater the consumption, the greater the bank loans, the more limited are the resources allocated to social and environmental policies. Finally, gender quota has a negative impact on the environmental score in one model (Model D; Table 5). This result confirms the great importance of “who the women are” instead of gender quota *sic et simpliciter* (Huse, 2018). Indeed, quotas can give rise to selection procedures, whereby women are not chosen on merit, skills, knowledge, capabilities, and experience, but only because of ethical or legal pressures.

5 | DISCUSSION

Our analysis reveals several important results. First, we find that there is a nonlinear relationship between board gender diversity and the environmental performance of banks. More specifically, when boards of directors include a large number of women (which exceeds the critical mass), environmental performance in the banking sector does not correlate with the percentage of women on the board, or eventually declines (inverted U-shaped relationship). Therefore, we do not find support for the critical mass theory, which posits the opposite relationship. The inverted U-shaped relationship may be supported by the “dual critical mass perspective,” which theorizes the importance of gender balanced boards (Schwartz-Ziv, 2017): male and female directors should exert an influence on the organization in a “structural equality” manner, leading to greater debates and more effective problem solving (Kogut, Colomer, & Belinky, 2014). This finding is in line with Pathan and Faff’s (2013) research indicating that the inclusion of more female directors does not necessarily increase bank

performance. This occurs especially during a period of financial crisis when the appointment of women board members beyond a “desirable” threshold could limit the inclusion of more talented and skilled male directors on the board.

On the contrary, in the few cases where banks are led by a woman CEO, a U-shaped relationship seems to emerge: there is a positive impact on environmental performance for an increasing share of women on the board exceeding an estimated threshold of 31%. Therefore, our study confirms the importance of women leaders and corroborates the critical mass theory for the banking sector, but only when banks are led by female CEOs. These findings also confirm the homophily perspective. The effectiveness of a large group of women on the board depends on the presence of women in other leadership positions. In banks, women CEOs could empower the critical mass of women on the board to pursue strong environmental initiatives.

In spite of our findings on the importance of women leaders in enhancing environmental performance, women appear to face significant difficulties entering top-level positions, especially in the financial sector (Sahay et al., 2017). A focus on OECD data shows a slight increase in the number of female directors: in 2016, the average share of women on boards of the largest publicly listed companies in OECD countries was 20%, as opposed to 16.8% in 2013 (see OECD Statistics). With regard to CEOs, in January 2017 only 23 women (4.6% of the total list) held CEO positions at S&P 500 companies. Therefore, women are still widely underrepresented in the highest employment positions and are affected by the “glass ceiling” phenomenon that slows or impedes their advancement (Setó-Pamies, 2015). This phenomenon is visible in the banking sector where the share of women both on governing boards of directors and supervisory agencies is still low (Sahay et al., 2017). Recent research conducted by SKEMA Business School Observatory in 2017 found that women in banks face a “double glass ceiling” where women make up 52.10% of employees and only 37.58% of middle managers (first glass ceiling). This representation drops to 16.45% in executive and apical positions (second glass ceiling). At the same time, scholars point out that a higher share of women on bank boards is associated with greater bank stability (Sahay et al., 2017) and bank performance (García-Meca et al., 2015). This evidence is very important because greater stability and profitability in the banking sector produces several benefits: “banks - indeed - perform a crucial role in the economy by

intermediating funds from savers and depositors to activities that support enterprise and help drive economic growth” (BCBS - Basel Committee on Banking Supervision, 2015:3).

Finally, a few reflections on the elements characterizing the context of a country may be useful. Recent meta-analyses show that contextual factors are central in shaping the magnitude and direction of the association between women directors and organizational performance. Specifically, Hoobler et al. (2018) suggested that female leadership is more likely to be positively related to firm financial performance in more gender egalitarian cultures, in climates that hold more progressive attitudes toward women. Similarly, Byron and Post (2016) provide evidence that women on boards tend to positively influence the firm's social performance in countries with higher gender parity and stronger shareholder protection. However, our results do not seem to confirm the findings of these studies. Both investor protection and gender equality (see Table 5), and the interactions of these two control variables with board gender diversity and woman CEO (estimates available upon request), are not significant. In our analysis, the context of a country per se is not important and these macrocontextual factors do not seem to strengthen the relationship between women leaders and environmental performance. This could be due to the fact that our analysis is restricted to only one typology of performance (environmental) and to a single industrial sector (banking).

The first limitation of our study is that our bank sample is characterized by low frequency of women in apical positions (CEO WOMAN has a mean equal to 8%, WOMEN BOD equal to 17.7%). Even though this is a common reality today, the relation between women leaders and (environmental) performance could drastically change in a possible future where the share of men and women in leadership is inverted. Secondly, our data have a heterogeneity in terms of geographical areas. In additional analysis not reported for brevity but available upon request, the results seem to be more pronounced for banks in emerging (Middle East and Africa) with respect to developed markets (Europe).

6 | CONCLUSIONS AND IMPLICATIONS

This study aims to analyse the effects of women leaders on the environmental performance of banks. To this end, we carried out an empirical investigation on a sample of 96 listed banks in the EMEA (Europe, Middle East and Africa) region by constructing a 6-year panel dataset (from 2011 to 2016) to determine whether banks with a critical mass of women on the board of directors and with a female CEO have proenvironmental behaviour. Among the main results, we find not only a nonlinear relationship between board gender diversity and the environmental performance of banks but also that female CEOs play a strategic role in shaping this relationship thus confirming the homophily perspective for the banking sector. The endogenously determined critical mass is around 30% women on the board of directors. Additionally, the presence of women CEOs per se has an additional positive influence on the environmental outcomes of banks.

Our results have important implications for companies and policy makers. Banks committed to sound environmental practices should select more women directors especially when they are headed by female CEOs. To do that, actions should be taken to overcome the “glass ceiling” problem. Banks should implement programs to support female employees, such as flexible working time arrangements, creating part-time job opportunities and interpersonal channels of communication. However, removing the barriers impeding women's progress can have important consequences only if there is a cultural shift and a growing public awareness of the significant contribution women bring to bank performance. This awareness is crucial to allowing women to reach the top echelons of management, which should in turn lead to proenvironmental behaviours. Our findings show not only that paying attention to gender diversity provides solid ground for sound environmental practices but also that gender-balanced boards matter for environmental performance. So, from a policy perspective, this seems to stress the benefits of providing incentives for a broader diversity of views and higher quality of communication, collaboration, and critical debate in the decision-making process (BCBS - Basel Committee on Banking Supervision, 2015). Our findings are particularly useful during periods such as the current one, where there is growing attention to environmental issues with banks. In this context, important synergies between bank managers and environmental policy makers could be created (Kassinis et al., 2016).

Future lines of research may examine the link between gender diversity and the environmental performance of banks by analysing the contribution of women in other top positions, like independent or outside female directors. It would also be interesting to understand the role of institutional variables (i.e., distinction between binding or self-regulatory rules on gender quotas and a country's environmental performance) in conditioning the link between gender diversity and sound environmental practices in banks. Finally, future research could extend the sample and the time horizon of the analysis to explore other geographical areas (i.e., America and Asia), other financial institutions (i.e., smaller banks), and the effects of the financial crisis on bank sustainability practices (Boulouta, 2013).

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REFERENCES

- Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2), 291–309. <https://doi.org/10.1016/j.jfineco.2008.10.007>
- Alazzani, A., Hassanein, A., & Aljanadi, Y. (2017). Impact of gender diversity on social and environmental performance: Evidence from Malaysia.

- Corporate Governance*, 17(2), 266–283. <https://doi.org/10.1108/CG-12-2015-0161>
- Alberici, A., & Querci, F. (2016). The quality of disclosures on environmental policy: The profile of financial intermediaries. *Corporate Social Responsibility and Environmental Management*, 23(5), 283–296. <https://doi.org/10.1002/csr.1375>
- Andrieș, A. M., Căpraru, B., Mínguez-Vera, A., & Nistor, S. (2018). Gender diversity on boards and bank efficiency across Emerging Europe. Available at SSRN: <https://ssrn.com/abstract=3041477> or <https://doi.org/10.2139/ssrn.3041477>
- Andrikopoulos, A., & Krikliani, N. (2013). Environmental disclosure and financial characteristics of the firm: The case of Denmark. *Corporate Social Responsibility and Environmental Management*, 20, 55–64. <https://doi.org/10.1002/csr.1281>
- Aramburu, I. A., & Pescador, I. G. (2019). The effects of corporate social responsibility on customer loyalty: The mediating effect of reputation in cooperative banks versus commercial banks in the Basque Country. *Journal of Business Ethics*, 154(3), 701–719. <https://doi.org/10.1007/s10551-017-3438-1>
- Baltagi, B. H. (2011). *Econometrics* (5th ed.). Berlin: Springer.
- BCBS - Basel Committee on Banking Supervision (July 2015). Guidelines. Corporate governance principles for banks. Accessed by 10 February 2019.
- Bell, L. A. (2005). Women-led firms and the gender gap in top executive jobs, IZA DP No. 1689.
- Ben-Amar, W., Chang, M., & McIlkenny, P. (2017). Board gender diversity and corporate response to sustainability initiatives: Evidence from the carbon disclosure project. *Journal of Business Ethics*, 142(2), 369–383. <https://doi.org/10.1007/s10551-015-2759-1>
- Berger, A. N., Kick, T., Koetter, M., & Schaeck, K. (2013). Does it pay to have friends? Social ties and executive appointments in banking. *Journal of Banking & Finance*, 37(6), 2087–2105. <https://doi.org/10.1016/j.jbankfin.2013.01.040>
- Berger, A. N., Kick, T., & Schaeck, K. (2014). Executive board composition and bank risk taking. *Journal of Corporate Finance*, 28, 48–65. <https://doi.org/10.1016/j.jcorpfin.2013.11.006>
- Borghesi, R., Houston, J. F., & Naranjo, A. (2014). Corporate socially responsible investments: CEO altruism, reputation, and shareholder interests. *Journal of Corporate Finance*, 26, 164–181. <https://doi.org/10.1016/j.jcorpfin.2014.03.008>
- Boulouta, I. (2013). Hidden connections: The link between board gender diversity and corporate social performance. *Journal of Business Ethics*, 113, 185–197. <https://doi.org/10.1007/s10551-012-1293-7>
- Burgess, Z., & Tharenou, P. (2002). Women board directors: Characteristics of the few. *Journal of Business Ethics*, 37(1), 39–49. <https://doi.org/10.1023/A:1014726001155>
- Burke, R. (1997). Women directors: Selection, acceptance, and benefits of board membership. *Corporate Governance: An International Review*, 7(4), 374–378. <https://doi.org/10.1111/1467-8683.00052>
- Byron, K., & Post, C. (2016). Women on boards of directors and corporate social performance: A meta-analysis. *Corporate Governance: An International Review*, 24(4), 428–442. <https://doi.org/10.1111/corg.12165>
- Cabeza-García, L., Fernández-Gago, R., & Nieto, M. (2017). Do board gender diversity and director typology impact CSR reporting? *European Management Review*, 15, 559–575. <https://doi.org/10.1111/emre.12143>
- Carter, M. E., Franco, F., & Gine, M. (2017). Executive gender pay gaps: The roles of female risk aversion and board representation. *Contemporary Accounting Research*, 34(2), 1232–1264. <https://doi.org/10.1111/1911-3846.12286>
- Chanavat, A., & Ramsden, K. (2014). Climb to the top-tracking gender diversity on corporate boards, Thomson Reuters, October.
- Childs, S., & Krook, M. L. (2008). Critical mass theory and women's political representation. *Political Studies*, 56(3), 725–736. <https://doi.org/10.1111/j.1467-9248.2007.00712.x>
- Chodrow, N. (1974). Family structure and feminist perspective. In M. Z. Rosaldo, & L. Lamphere (Eds.), *Women in culture and society* (pp. 41–48). Stanford, CA: Stanford University Press.
- Ciocirlan, C., & Pettersson, C. (2012). Does workforce diversity matter in the fight against climate change? An analysis of Fortune 500 companies. *Corporate Social Responsibility and Environmental Management*, 19(1), 47–62. <https://doi.org/10.1002/csr.279>
- Cornett, M. M., Erhemjamts, O., & Tehranian, H. (2016). Greed or good deeds: An examination of the relation between corporate social responsibility and the financial performance of U.S. commercial banks around the financial crisis. *Journal of Banking & Finance*, 70, 137–159. <https://doi.org/10.1016/j.jbankfin.2016.04.024>
- Cucari, N., De Falco, S. E., & Orlando, B. (2018). Diversity of board of directors and environmental social governance: Evidence from Italian listed companies. *Corporate Social Responsibility and Environmental Management*, 25(3), 250–266. <https://doi.org/10.1002/csr.1452>
- Davidson, D. J., & Freudenburg, W. R. (1996). Gender and environmental risk concerns: A review and analysis of available literature. *Environment and Behavior*, 28(3), 302–339. <https://doi.org/10.1177/0013916596283003>
- Dawson, J., Kersley, R., & Natella, S. (2016). The CS gender 3000: The reward for change. Credit Suisse Research Institute, September. <http://publications.credit-suisse.com/tasks/render/file/index>
- Deloitte (2016). EMEA 360 boardroom survey country profiles. June. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Finance/gx-deloitte-uk-emea-360-boardroom-survey-country-profiles.pdf>. Accessed 12 January 2019.
- Deschênes, S., Rojas, M., Boubacar, H., Prud'homme, B., & Ouedraogo, A. (2015). The impact of board traits on the social performance of Canadian firms. *Corporate Governance*, 15(3), 293–305. <https://doi.org/10.1108/CG-08-2014-0097>
- European Commission (2018). Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank, the European Economic and Social Committee and the Committee of the Regions. Action Plan: Financing Sustainable Growth. Brussels, COM(2018) 97 final. <https://ec.europa.eu/transparency/regdoc/rep/1/2018/EN/COM-2018-97-F1-EN-MAIN-PART-1.PDF>.
- Faccio, M., Marchica, M. T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, 39, 193–209. <https://doi.org/10.1016/j.jcorpfin.2016.02.008>
- Farag, H., & Mallin, C. (2017). Board diversity and financial fragility: Evidence from European banks. *International Review of Financial Analysis*, 49, 98–112. <https://doi.org/10.1016/j.irfa.2016.12.002>
- Fernández-Feijoo, B., Romero, S., & Ruiz-Blanco, S. (2014). Women on boards: Do they affect sustainability reporting. *Corporate Social Responsibility and Environmental Management*, 21(6), 351–364. <https://doi.org/10.1002/csr.1329>
- Francis (2015). *Encyclical letter Laudato Si' of the holy father Francis on care for our common home*. Rome: Vatican Press. http://w2.vatican.va/content/francesco/it/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html
- Galbreath, J. (2011). Are there gender-related influences on corporate sustainability? A study of women on boards of directors. *Journal of Management & Organization*, 17(1), 17–38. <https://doi.org/10.1017/S1833367200001693>

- Gangi, F., Meles, A., D'Angelo, E., & Daniele, L. M. (2018). Sustainable development and corporate governance in the financial system: Are environmentally friendly banks less risky? *Corporate Social Responsibility and Environmental Management*, 1–19. <https://doi.org/10.1002/csr.1699>
- García-Meca, E., García-Sánchez, I. M., & Martínez-Ferrero, J. (2015). Board diversity and its effects on bank performance: An international analysis. *Journal of Banking & Finance*, 53(2015), 202–214. <https://doi.org/10.1016/j.jbankfin.2014.12.002>
- García-Sánchez, I. M., Martínez-Ferrero, J., & García-Meca, E. (2018). Board of directors and CSR in banking: The moderating role of bank regulation and investor protection strength. *Australian Accounting Review* No. 86, 28(3), 428–445. <https://doi.org/10.1111/auar.12199>
- Giannarakis, G., & Theotokas, I. (2011). The effect of financial crisis in corporate social responsibility performance. *International Journal of Marketing Studies*, 3(1), 2–10. <https://doi.org/10.5539/ijms.v3n1p2>
- Gilligan, C. (1982). *In a different voice*. Cambridge, MA: Harvard University Press.
- Glass, C., & Cook, A. (2017). Do women leaders promote positive change? Analyzing the effect of gender on business practices and diversity initiatives. *Human Resource Management*, <https://doi.org/10.1002/hrm.21838>, 57, 823–837.
- Glass, C., Cook, A., & Ingersoll, A. R. (2016). Do women leaders promote sustainability? Analysing the effect of corporate governance composition on environmental performance. *Business Strategy and the Environment*, 25(7), 495–511. <https://doi.org/10.1002/bse.1879>
- Halkos, G. E., & Polemis, M. L. (2017). Does financial development affect environmental degradation? Evidence from the OECD countries. *Business Strategy and the Environment*, 26(8), 1162–1180. <https://doi.org/10.1002/bse.1976>
- Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review*, 32(2), 334–343. <https://www.jstor.org/stable/2015930>. <https://doi.org/10.5465/amr.2007.24345254>
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193–206. <https://www.jstor.org/stable/258434>. <https://doi.org/10.5465/amr.1984.4277628>
- Helfaya, A., & Moussa, T. (2017). Do board's corporate social responsibility strategy and orientation influence environmental sustainability disclosure? UK evidence. *Business Strategy and the Environment*, 26(8), 1061–1077. <https://doi.org/10.1002/bse.1960>
- HLEG - High-Level Group on Sustainable Finance (2018). Financing a sustainable European economy. Final report. Resource document. European Commission. https://ec.europa.eu/info/sites/info/files/180131-sustainable-finance-final-report_en.pdf. Accessed 12 February 2019.
- Hoobler, J. M., Masterson, C. R., Nkomo, S. M., & Michel, E. J. (2018). The business case for women leaders: Meta-analysis, research critique, and path forward. *Journal of Management*, 44(6), 2473–2499. <https://doi.org/10.1177/0149206316628643>
- Hu, V. I., & Scholtens, B. (2014). Corporate social responsibility policies of commercial banks in developing countries. *Sustainable Development*, 22(4), 276–288. <https://doi.org/10.1002/sd.1551>
- Huang, S. K. (2013). The impact of CEO characteristics on corporate sustainable development. *Corporate Social Responsibility and Environmental Management*, 20(4), 234–244. <https://doi.org/10.1002/csr.1295>
- Hur, W. M., Kim, H., & Jang, J. H. (2016). The role of gender differences in the impact of CSR perceptions on corporate marketing outcomes. *Corporate Social Responsibility and Environmental Management*, 23, 345–357. <https://doi.org/10.1002/csr.1380>
- Huse, M. (2018). Gender in the boardroom: Learnings from world-leader Norway. *FACTBase Bulletin* 58, March. <https://www.committeeforperth.com.au/research/factbase-research/factbase-bulletins>
- Hussain, N., Rigoni, U., & Orij, R. P. (2018). Corporate governance and sustainability performance: Analysis of triple bottom line performance. *Journal of Business Ethics*, 149(2), 411–432. <https://doi.org/10.1007/s10551-016-3099-5>
- Jia, M., & Zhang, Z. (2013). Critical mass of women on BODs, multiple identities, and corporate philanthropic disaster response: Evidence from privately owned Chinese firms. *Journal of Business Ethics*, 118, 303–317. <https://doi.org/10.1007/s10551-012-1589-7>
- Jiang, X., & Akbar, A. (2018). Does increased representation of female executives improve corporate environmental investment? Evidence from China. *Sustainability*, 10, 4750. <https://doi.org/10.3390/su10124750>
- Jo, H., Kim, H., & Park, K. (2015). Corporate environmental responsibility and firm performance in the financial services sector. *Journal of Business Ethics*, 131(2), 257–284. <https://doi.org/10.1007/s10551-015-3005-6>
- Joecks, J., Pull, K., & Vetter, K. (2013). Gender diversity in the boardroom and firm performance: What exactly constitutes a “critical mass”? *Journal of Business Ethics*, 118(1), 61–72. <https://doi.org/10.1007/s10551-012-1553-6>
- Kanter, R. (1977). Some effects of proportions on group life: Skewed sex ratios and responses to token women. *American Journal of Sociology*, 82(5), 965–990. <https://doi.org/10.1086/226425>
- Karl, M. (2015). Are ethical and social banks less risky? Evidence from a New Dataset, DIW Berlin.
- Kassinis, G., Panayiotou, A., Dimou, A., & Katsifaraki, G. (2016). Gender and environmental sustainability: A longitudinal analysis. *Corporate Social Responsibility and Environmental Management*, 23(6), 399–412. <https://doi.org/10.1002/csr.1386>
- 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. <https://doi.org/10.1108/17542431011029406>
- Kılıç, 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*, 15(3), 357–374. <https://doi.org/10.1108/CG-02-2014-0022>
- Kogut, B., Colomer, J., & Belinky, M. (2014). Structural equality at the top of the corporation: Mandated quotas for women directors. *Strategic Management Journal*, 35(6), 891–902. <https://doi.org/10.1002/smj.2123>
- Konrad, A. M., Kramer, V., & Erkut, S. (2008). Critical mass: The impact of three or more women on corporate boards. *Organizational Dynamics*, 37(2), 145–164. <https://doi.org/10.1016/j.orgdyn.2008.02.005>
- Kramer, V. W., Konrad, A. M., & Erkut, S. (2006). Critical mass on corporate boards: Why three or more women enhance governance. Working Paper Series, Report No. WCW 11. Wellesley Centers for Women. <http://www.wcwonline.org/pubs/title.php?id=487>
- Li, J., Zhao, F., Chen, S., Jiang, W., Liu, T., & Shi, S. (2017). Environmental policy gender diversity on boards and firms' environmental policy. *Business Strategy and the Environment*, 26(3), 306–315. <https://doi.org/10.1002/bse.1918>
- Liao, L., Luo, L., & Tang, Q. (2015). Gender diversity, board independence, environmental committee and greenhouse gas disclosure. *The British Accounting Review*, 47, 409–424. <https://doi.org/10.1016/j.bar.2014.01.002>

- Liu, C. (2018). Are women greener? Corporate gender diversity and environmental violations. *Journal of Corporate Finance*, 52, 118–142. <https://doi.org/10.1016/j.jcorpfin.2018.08.004>
- Lundgren, M., & Catasús, B. (2000). The banks' impact on the natural environment—on the space between 'what is' and 'what if. *Business Strategy and the Environment*, 9(3), 186–195. [https://doi.org/10.1002/\(SICI\)1099-0836\(200005/06\)9:3<186::AID-BSE242>3.0.CO;2-J](https://doi.org/10.1002/(SICI)1099-0836(200005/06)9:3<186::AID-BSE242>3.0.CO;2-J)
- Luo, J. h., Huang, Z., Li, X., & Lin, X. (2018). Are women CEOs valuable in terms of bank loan costs? Evidence from China. *Journal of Business Ethics*, 153(2), 337–355. <https://doi.org/10.1007/s10551-016-3369-2>
- Manner, M. (2010). The impact of CEO characteristics on corporate social performance. *Journal of Business Ethics*, 93(Suppl 1), 53–72. <https://doi.org/10.1007/s10551-010-0626-7>
- Mateos de Cabo, R. M., Gimeno, R., & Nieto, M. J. (2012). Gender diversity on European banks' board of directors. *Journal of Business Ethics*, 109(2), 145–162. <https://doi.org/10.1007/s10551-011-1112-6>
- Matsa, D. A., & Miller, A. R. (2013). A female style in corporate leadership? Evidence from quotas. *American Economic Journal*, 5(3), 136–169. <https://www.jstor.org/stable/43189445>
- Mohai, P., & Kershner, D. (2002). Race and environmental voting in the US Congress. *Social Science Quarterly*, 83(1), 167–189. <https://doi.org/10.1111/1540-6237.00077>
- Nellemann, C., Verma, R., & Hislop, L. (2011). Women at the frontline of climate change: Gender risks and hopes. A Rapid Response Assessment. United Nations Environment Programme, GRID-Arendal. <http://www.grida.no/publications/198>
- Owen, A. L., & Temesvary, J. (2018). The performance effects of gender diversity on bank boards. *Journal of Banking & Finance*, 90, 50–63. <https://doi.org/10.1016/j.jbankfin.2018.02.015>
- Palvia, A., Vähämaa, E., & Vähämaa, S. (2015). Are female CEOs and chairwomen more conservative and risk averse. Evidence from the banking industry. *Journal of Business Ethics*, 131(3), 577–594. <https://doi.org/10.1007/s10551-014-2288-3>
- Pätäri, S., Jantunen, A., Kyläheiko, K., & Sandström, J. (2012). Does sustainable development foster value creation? Empirical evidence from the global energy industry. *Corporate Social Responsibility and Environmental Management*, 19(6), 317–326. <https://doi.org/10.1002/csr.280>
- Pathan, S., & Faff, R. (2013). Does board structure in banks really affect their performance? *Journal of Banking & Finance*, 37(5), 1573–1589. <http://dx.doi.org/10.1016/j.jbankfin.2012.12.016>
- Post, C., & Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal*, 58(5), 1546–1571. <https://doi.org/10.5465/amj.2013.0319>
- Post, C., Rahman, N., & Rubow, E. (2011). Green governance: Boards of directors' composition and environmental corporate social responsibility. *Business & Society*, 50(1), 189–223. <https://doi.org/10.1177/0007650310394642>
- Ramly, Z., Chan, S. G., Mustapha, M. Z., & Sapiei, N. S. (2015). Women on boards and bank efficiency in ASEAN-5: The moderating role of the independent directors. *Review of Managerial Science*, 11(1), 225–250. <https://doi.org/10.1007/s11846-015-0186-4>
- 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. <https://doi.org/10.1007/s10551-015-2613-5>
- Rao, K. K., Tilt, C. A., & Lester, L. H. (2012). Corporate governance and environmental reporting: An Australian study. *Corporate Governance*, 12(2), 143–163. <https://doi.org/10.1108/14720701211214052>
- Rupley, K. H., Brown, D., & Marshall, R. S. (2012). Governance, media, and the quality of environmental disclosure. *Journal of Accounting and Public Policy*, 31(6), 610–640. <https://doi.org/10.1080/0969160X.2013.845039>
- Sahay, R., Čihák, M., N'Diaye, P., Barajas, A., Kyobe, A., Mitra, S., ... Yousefi S. R. (2017). Banking on women leaders: A case for more? International Monetary Fund WP/17/199. <https://www.imf.org/en/Publications/WP/Issues/2017/09/07/Banking-on-Women-Leaders-A-Case-for-More-45221>
- Schwartz-Ziv, M. (2017). Gender and board activeness: The role of a critical mass. *Journal of Financial and Quantitative Analysis*, 52(2), 751–780. <https://doi.org/10.1017/S0022109017000059>
- Setó-Pamies, D. (2015). The relationship between women directors and corporate social responsibility. *Corporate Social Responsibility and Environmental Management*, 22(6), 334–345. <https://doi.org/10.1002/csr.1349>
- Shoham, A., Almor, T., Lee, S. M., & Ahammad, M. F. (2017). Encouraging environmental sustainability through gender: A micro-foundational approach using linguistic gender marking. *Journal of Organizational Behavior*, 38(9), 1356–1379. <https://doi.org/10.1002/job.2188>
- Strøm, R. Ø., D'Espallier, B., & Mersland, R. (2014). Female leadership, performance, and governance in microfinance Institutions. *Journal of Banking & Finance*, 42, 60–75. <https://doi.org/10.1016/j.jbankfin.2014.01.014>
- Tate, G., & Yang, L. (2015). Female leadership and gender equity: Evidence from plant closure. *Journal of Financial Economics*, 117(1), 77–97. <https://doi.org/10.1016/j.jfineco.2014.01.004>
- Terjesen, S., & Singh, V. (2008). Female presence on corporate boards: A multi-country study of environmental context. *Journal of Business Ethics*, 83(1), 55–63. <https://doi.org/10.1007/s10551-007-9656-1>
- Thompson, P. (1998). Assessing the environmental risk exposure of UK banks. *The International Journal of Bank Marketing*, 16(3), 129–139. <https://doi.org/10.1108/02652329810213547>
- Trireskani, T., & Djajadikerta, H. G. (2016). Corporate governance and environmental disclosure in the Indonesian mining industry. *Australasian Accounting, Business and Finance Journal*, 10(1), 18–28. <https://doi.org/10.14453/aabfj.v10i1.3>
- Vähämaa, E. (2017). Female executives and corporate governance. *Managerial Finance*, 43(10), 1056–1072. <https://doi.org/10.1108/MF-04-2016-0098>
- Walls, J. L., Berrone, P., & Phan, P. H. (2012). Corporate governance and environmental performance: Is there really a link? *Strategic Management Journal*, 33(8), 885–913. <https://doi.org/10.1002/smj.1952>
- Weber Shandwick & KRC Research (2015). Gender equality in the executive ranks: A paradox—The journey to 2030. <https://www.webershandwick.com/uploads/news/files/gender-equality-in-the-executive-ranks-report.pdf>. Accessed 12 December 2018.

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