



Research article

Gender diversity on boards and environmental violations in European firms

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Abstract: Knowledge of the impact of board gender diversity on environmental violations in Europe remains limited, as previous literature has focused on socially responsible practices, with less research being directed toward the determinants of corporate actions that harm the environment. This study aimed to address this gap through a multi-theoretical approach and by using different estimation methods. In addition, we used penalties related to environmentally harmful practices, since they represent an appropriate proxy for measuring environmental irresponsibility given that they directly reflect sanctions imposed by regulators and are therefore not subject to manipulation or greenwashing practices. We analyzed a sample of non-financial firms in the STOXX Europe 600 index for 2016–2022. Our findings indicate that board gender diversity leads to a reduction in environmental violations. These results suggest that female directors help mitigate environmental misconduct by improving oversight, enhancing the firm’s public image, and facilitating access to essential resources. In addition, board gender diversity improves decision-making and fosters a culture of sustainability by integrating diverse perspectives and approaches. We validated the robustness of our results by using different procedures to address endogeneity issues (OLS, TOBIT, 2SLS, Heckman, and GMM).

Keywords: board gender diversity; environmental violations; agency conflict; resource dependence; legitimacy; human capital theory; attribution theory; fault line theory

JEL Codes: G34, M14

1. Introduction

The presence of women on boards of directors has increased significantly in recent years (Spencer Stuart, 2022), boosting corporate and academic interest in understanding the impact of their presence on corporate performance (Laique et al., 2023; Mumu et al., 2022; Baker et al., 2020). Parallel to social and academic interest in the role of women in positions of responsibility in firms, another key challenge has emerged, namely what environmental impact firms have. According to the report *Reaching Net Zero by 2050*, based on an analysis of over 1,000 listed companies in main European stock market indices, firms' commitment to reach zero greenhouse gas emissions has accelerated over the last two years. Also, almost a third of the largest European listed companies have set themselves the target of achieving this reduction by 2050 (Bouckaert et al., 2021). This commitment has been driven by increased pressure from both investors and consumers, who demand more environmentally responsible behaviors from firms and governments (Al Amosh, 2024a; Liu, 2018; Ioannou & Serafeim, 2015; Flammer, 2013). The increasing stakeholder demand for sustainable practices has strengthened firms' environmental commitment, leading them to adopt standards that are more beneficial for the planet in the long term. A new strand of literature has thus emerged focusing on investigating firms' environmental performance, highlighting the importance of sustainable practices and their positive impact on the environment (Ananzeh et al., 2024; Liao and Zhang, 2024; Al Amosh & Khatib, 2023; Nadeem, 2021; Henry et al., 2019; Liu, 2018; Bhandari and Javakhadze, 2017; Fernando et al., 2017; Ferrell et al., 2016; Flammer, 2015; Krüger, 2015), and pointing to the importance of board composition in determining firms' social performance (Al Amosh, 2024b; Esterhuyse, 2020; Kikwiye, 2019).

In this setting, some examples point to female leadership as being key to promoting sustainable practices in global firms. Mary Barra, CEO of General Motors, has led the transition to electric vehicles and has committed to achieving net zero emissions by 2040. Isabelle Kocher, former CEO of Engie in France, has driven a transition to cleaner energy, focusing on energy efficiency and investment in renewable energy. Ana Botín, president of Banco Santander, has integrated environmental, social, and governance (ESG) criteria into the bank's strategy, promoting sustainability and moving toward a green economy. Lisa Jackson, the vice president of Apple, has been instrumental in implementing a model based on the exclusive use of renewable energy in the firm's operations. In addition, academic literature has highlighted the presence of female directors as a key factor in firms' ethical performance (Kamran et al., 2023; Wu et al., 2022; Amorrelli & García-Sánchez, 2020; Liao et al., 2015; Post et al., 2011). However, firms can be both socially "good and bad" at the same time (Fleitas-Castillo et al., 2024; Clark et al., 2022; Nardella et al., 2020; Keig et al., 2015; Herzig & Moon, 2013; Strike et al., 2006). Analysis of firms' social behavior therefore proves complex and requires a holistic approach to assess the true social impact of corporate activities. While firms may be increasing their environmental responsibility through more responsible and environmentally friendly practices, they may also, at the same time, be engaging in irresponsible actions that harm the environment. Exploring the drivers of unethical corporate behavior thus emerges as a pivotal issue. Previous literature points to the pressure to reduce costs, the lack of strict regulations, or the weakness of institutions as drivers of irresponsible actions (Gao & Yang, 2021; Surroca et al., 2013; Boudier & Bensebaa, 2011; Matten & Moon, 2008; Matten & Moon, 2005). Nevertheless, the relationship between female directors and episodes of environmental irresponsibility in firms has been largely overlooked.

The relationship between gender diversity and environmental violations remains unclear from a theoretical standpoint, and female directors may be key contributors to higher ethical standards, greater

scrutiny, and high-quality decision-making, stemming from a variety of experiences and perspectives (Feng & Xiang, 2023; Briano-Turrent, 2022; Ongsakul et al., 2021; Adams et al., 2015; Gul et al., 2011; Adams & Ferreira, 2009; Cox & Blake, 1991). These studies suggest that female directors exhibit greater independence from the “old boys’ club” and show more concern for their reputational role in overseeing corporate decisions (Kamil & Appiah, 2022; Nadeem et al., 2020; Levi et al., 2014). Compared to male directors, female directors tend to better safeguard stakeholder concerns by avoiding opportunistic performance (Javeed et al., 2022; Usman et al., 2019; Zalata et al., 2019). In addition, they enhance the firm’s legitimacy by increasing trust, transparency, and ethical reputation, thus attracting investors, customers, and employees (Zahid et al., 2025; Nadeem, 2021). However, from an attribution perspective, the appointment of female directors might be used as a symbolic strategy to mitigate any negative impact on the setting, i.e., the firm might use female directors as an instrument to increase stakeholder trust so that stakeholders react less negatively to unethical performance (Nirino et al., 2021). Female directors therefore act as moral capital or as an “insurance policy” that protects the firm from the negative effects of environmental violations, giving it “the benefit of the doubt” regarding the organization’s intentions (Godfrey, 2005; Klein & Dawar, 2004; Borghesi et al., 2014; Shiu & Yang, 2017). In addition, the presence of female directors might create fault lines in the board by dividing it into subgroups based on directors’ demographic characteristics (Mäs et al., 2013; Lau & Murnighan, 1998). The presence of fault lines leads to weaker board performance (Thatcher et al., 2003), which may facilitate the occurrence of environmental violations.

We aim to shed light on this issue by examining the impact of female directors on corporate environmental violations. To achieve this, we analyzed a sample of European non-financial firms included in the Euro Stoxx 600 from 2016 to 2022. Drawing on information provided by the Good Jobs First database, we used environmental fines as a measure of corporate environmental misconduct. These fines represent substantiated violations of environmental regulations and are imposed by government agencies as a result of official investigations, thereby providing a clear and transparent resolution of environmental infractions (Duan et al., 2024; Foulon & Marsat, 2023; Raghunandan & Rajgopal, 2022; Wu et al., 2021; Wang et al., 2020; Du, 2015). Furthermore, due to their more direct nature and the authority of the regulatory actions that lie behind them, environmental fines are not susceptible to corporate manipulation through greenwashing—a tactic used by some firms to improve their public image without adequately addressing environmental concerns (Birindelli et al., 2024; Eliwa et al., 2023; Liu, 2018; Matejek & Gössling, 2014; Laufer, 2003; Fields, 2002). We employed various models to address endogeneity and data-censoring problems. In all cases, results showed a negative impact of the presence of female directors on firms’ environmental sanctions.

Our study makes several contributions to existing literature. First, it enhances the current understanding of what impact women in leadership roles have on corporate policies, particularly those affecting the environment. This highlights the outcomes and implications of policies that promote gender diversity in the corporate arena (García-Meca et al., 2022; Liu et al., 2014; Cumming et al., 2015; Adams & Ferreira, 2009). While previous research has found a link between gender diversity and increased positive corporate social responsibility initiatives (Javeed et al., 2022; Orazalin & Baydauletov, 2020; McGuinness et al., 2017), the influence of female directors on corporate environmental misbehavior remains largely unexplored. This study addresses this gap by using environmental sanctions as a direct measure of environmental misconduct, providing new evidence that greater gender representation in firms is associated with fewer environmental violations. Second, this research contributes to the literature on environmental risks and corporate governance (Kazim et

al., 2024; Shahab et al., 2023; Abebe & Acharya, 2022; Carvajal et al., 2022; Kyaw et al., 2022; Kassinis & Vafeas, 2002) providing further evidence to the study of Liu (2018) by showing that gender diversity on boards correlates with a reduction in environmental violations in a setting of low litigation risk, a high prevalence of ownership concentration (Djankov et al., 2008; La Porta et al., 1999), and where reputation plays a prominent role as a mechanism to discipline dominant owners and managers (Young et al., 2008; Cuervo, 2002; La Porta et al., 1998, 2000). Additionally, we employ a multi-theoretical approach that incorporates theories such as agency, legitimacy, upper echelons, resource dependence, human capital, attribution, and fault lines. The study also provides empirical support for the idea that greater female representation in corporate governance might reduce environmental violations by firms. Finally, the study helps to evaluate environmental violations by using fines as a measure of firms' environmental irresponsibility (Duan et al., 2024; Foulon & Marsat, 2023; Raghunandan & Rajgopal, 2022; Wu et al., 2021; Wang et al., 2020; Du, 2015). Penalties represent the best proxy for measuring environmental irresponsibility because they directly reflect the sanctions imposed by regulators that result from specific breaches of environmental regulations.

2. Study context overview

The relationship between board gender diversity and environmental violations might vary significantly between regions due to cultural, regulatory, and economic factors. Europe leads the way in female representation thanks to the push for more advanced policies such as gender quotas and greater commitment to environmental protection and sustainability, as well as greater regulatory and social pressure to comply with ESG standards (Wang et al., 2021), which contrasts with Asia and emerging economies. In Asia, cultural traditions persist and there is still a more centralized corporate governance system, which tends to limit the impact of female directors on sustainability strategies. Cultural traditions deeply rooted in Confucianism thus perpetuate traditional views of the role of women in the family and restrict their career advancement (He, 2023; Taylor, 2005). Additionally, the historical context of market liberalization in China, which commenced in 2005, has further reinforced these gender barriers, since this more liberal economic model significantly reduced state intervention in feminist policies, favoring a male-dominated work setting and limiting opportunities for female advancement (Bell, 2010; Jiang, 2009). These gender barriers are most evident in key industries in the country, many of which have a high environmental impact and are dominated by traditional power structures (Yao et al., 2020). Accordingly, despite great economic progress in the socio-political context, culture continues to profoundly influence the role of women in Chinese firms. This is illustrated by the Deloitte report (2024), which shows that only 15.1% of board seats in China are held by women, a considerably lower percentage than the European average of approximately 30%. In this context, environmental violations in China are subject to severe government sanctions that increase financial costs for the firms responsible (Ma et al., 2022; Du et al., 2017). Limited female representation on boards thus hinders the implementation of more environmentally responsible policies, given the lower weight of diverse perspectives in strategic decision-making (Iwasaki et al., 2024).

Emerging economies such as Pakistan, Malaysia, and Thailand are characterized by concentrated ownership structures, especially in family-owned firms, where owners exercise significant control over strategic decisions (Carney & Child, 2013; Wei & Zhang, 2008; Du & Dai, 2005; Claessens et al., 2000). Although the presence of women on boards may improve practices related to sustainability and the environment, their effect on environmental violations is limited due to cultural barriers and the

difficulty involved in accessing influential leadership positions (Yasser et al., 2017). In addition, environmental regulations in these regions tend to be weaker and enforcement less strict, which reduces incentives to adopt policies that prioritize sustainability (Amin et al., 2023). Consequently, Europe becomes a setting of particular concern for analyzing the gender diversity–environmental violations relationship due to the significant presence of female directors and the importance of environmental actions for stakeholders, such that the results obtained may help to establish policy strategies in other settings.

3. Literature review

Environmental sustainability has become a crucial factor for firms due to growing investor sensitivity toward the environment and less tolerance toward practices that damage the natural environment (Birindelli et al., 2024; Eliwa et al., 2023; Bolton & Kacperczyk, 2021). In this regard, Krueger et al. (2020) showed that climate risks are a major concern for institutional investors and have a significant impact on the valuation of firms with poor environmental practices. Flammer (2021) added that firms who engage in green finance, such as issuing green bonds, experience positive valuation effects, in contrast to the negative impacts observed for firms who engage in harmful environmental practices. Cheng et al. (2023) and Flamer (2013) also pointed out that increased investor awareness of environmental issues has led to harsher penalization of firms that damage the environment. Ioannou & Serafeim (2015) concluded that the relationship between ESG criteria and financial performance has strengthened, especially as stakeholders become less tolerant of negative impacts on the environment (Eliwa et al., 2023). Taken together, these studies underline the growing importance of environmental sustainability for firms, not only for ethical and social responsibility reasons but also because of the direct impact on valuation and financial performance.

However, firms may commit acts against the environment mainly due to pressure to maximize short-term profits and to cut operating costs (Atay & Terpstra-Tong, 2020; Boudier & Bensebaa, 2011; Campbell, 2007), which leads them to minimize environmental management costs and to opt for more economical—albeit environmentally damaging—practices (Chen & Dagestani, 2023; Yu et al., 2020; Delmas & Toffel, 2008). According to Delmas & Pekovic (2013), adopting innovative environmental practices can be hampered by the perception of high costs and risks, leading firms to prioritize immediate benefits over long-term sustainability. In addition, the lack of strong sanctions or the weak enforcement of environmental regulations in certain regions may incentivize firms to take risks and commit environmentally irresponsible acts (Xia et al., 2023; Zou et al., 2015; Darnall et al., 2008). Managers and dominant owners may therefore have the incentive to engage in environmentally irresponsible acts. Executive compensation is often linked to short-term financial metrics such as share price and quarterly earnings, which may encourage decisions that provide immediate results at the expense of environmental sustainability (Eccles et al., 2014). In addition, dominant owners—especially in family-owned or investment group-controlled firms—may push to maximize short-term profitability and ignore long-term environmental risks (Fleitas-Castillo et al., 2024; Berrone et al., 2012). In some cases, the lack of a corporate culture focused on social and environmental responsibility may result in decision-making that neglects the ecological impact (García-Sánchez et al., 2016).

In this context, one effective strategy is to incorporate women into boards of directors, as numerous studies have indicated that female presence in management roles can foster more responsible and sustainable corporate behavior (Kamran et al., 2023; Wu et al., 2022; Amorrelli & García-Sánchez,

2020; Liao et al., 2015; Post et al., 2011). This aligns with the argument that women display greater awareness and pragmatism when it comes to environmental issues, whereas men often exhibit more skepticism and focus on the financial aspects of green initiatives (Lu & Herremans, 2019). Furthermore, women generally show more concern for environmental issues and are more generous and humanitarian, as well as more attuned to stakeholder demands (Oyewo, 2023; Saeed et al., 2022; Kassinis et al., 2016). According to García-Sánchez et al. (2023), female leadership is positively linked with achieving the 2030 Agenda goals related to environmental protection and promoting sustainable practices. Incorporating female directors not only helps to mitigate environmental risks but also enhances the firm's reputation, making it more attractive to investors who increasingly value a commitment to responsible and sustainable practices.

Nevertheless, the appointment of female directors might be used as a symbolic strategy that incentivizes environmental violations, with women being employed as an instrument that benefits the firm's public image (Nirino et al., 2021). Furthermore, the presence of female directors might create fault lines on the board (Lau & Murnighan, 1998; Mäs et al., 2013), generating subgroups that undermine the board's work (Thatcher et al., 2003) and lead to unethical environmental performance. The effect of board gender diversity on environmentally damaging actions is therefore a complex issue from a theoretical perspective.

3.1. Negative impact of female directors on environmental violations

Different theoretical arguments support a negative relationship between the presence of female directors and the performance of environmental practices. From an agency perspective, the presence of women improves oversight and control over managers and dominant owners (Kamil & Appiah, 2022; Nadeem et al., 2020; Levi et al., 2014) and reduces opportunistic and irresponsible performance (Javeed et al., 2022; Usman et al., 2019; Zalata et al., 2019). In addition, women tend to take into account a wider range of concerns and values in decision-making, which reduces the possibility of engaging in environmentally harmful performance (Javeed et al., 2022). As such, the presence of female directors increases their visibility, enhancing their incentives to signal their control over the firm's performance. This is due to the fact that the female labor market is narrower than that of their male counterparts, which implies facing higher reputational costs that may condition possible future appointments (Fleitas-Castillo et al., 2024; Godfrey et al., 2024; Gilson, 1990). Similarly, the upper echelon theory justifies the reduction of environmental malpractices as a consequence of greater female representation on the board (Perryman et al., 2016; Graham et al., 2017), as it facilitates the influence on corporate decision-making of the characteristics associated with female directors, such as higher ethical performance, control, and concern for stakeholders' demands.

The resource dependence theory argues that organizations depend on external resources for their survival and success (Tejersen et al., 2009; Pfeffer and Salancik, 1978). Accordingly, female appointments to boards might enhance firms' ability to access a wide range of resources, such as knowledge, perspectives, contacts, reputation, and information (Martinez-Garcia et al., 2022; Nguyen et al., 2015; Ali et al., 2014). This is especially relevant in the environmental context, where the firm may need access to natural or technological resources to implement sustainable practices. In addition, women tend to show greater concern for the environment, while men tend to be more concerned with financial aspects than with green initiatives (Lu and Herremans, 2019). Female directors can provide the firm with different perspectives and networks that facilitate access to critical resources, and they

may also enhance the firm's reputation and credibility as well as attract more resources and investment opportunities (Nadeem, 2020; Krishnan & Park, 2005). Strengthening the firm's resource base reduces the need to resort to irresponsible practices to obtain resources, which has been identified as one of the main reasons why firms engage in unethical performance (Gao & Yang, 2021; Boudier & Bensebaa, 2011). Complementary arguments—such as human capital theory—posit that firms benefit significantly from having directors who possess a diversity of skills and knowledge (Zhu et al., 2024; Terjesen et al., 2009). Female directors improve regulatory compliance (Gull et al., 2018; Rao & Tilt, 2016) since the effectiveness of oversight and resource allocation functions is enhanced by the board's greater knowledge and skills (Maswadi & Amran, 2023). In the environmental context, such board diversity can enhance the firm's ability to effectively identify and address environmental challenges (Hafsi & Turgut, 2013), thereby enriching decision-making and discouraging environmental breaches, as the inclusion of women on the board promotes sustainable practices (Zhu et al., 2024). Additionally, the presence of female directors favors the arguments provided by the gender socialization theory, according to which greater diversity increases the board's pool of experience, knowledge, and skills, thus reducing environmental malpractices (Zahid et al., 2025).

For its part, legitimacy theory suggests that firms must maintain legitimacy and social acceptance in order to survive and prosper in the long term (Suchman, 1995). This implies that they must align their practices and objectives with the expectations and norms of the society in which they operate, thereby ensuring their long-term sustainability and success (Giannarakis et al., 2023). The inclusion of female directors on the board can enhance the public perception and legitimacy of the firm and demonstrate a commitment to gender diversity and corporate responsibility. Furthermore, previous literature indicates that the presence of female directors is related to greater ethics (Nadeem, 2021), greater stakeholder interest (Javeed et al., 2022), improved accountability (Lucas-Perez et al., 2015), greater transparency (Ain et al., 2021), and to promoting a culture of responsibility and ethics. A firm that is perceived as being ethical and responsible is more likely to be seen as legitimate and worthy of stakeholder support (Nadeem, 2021). In addition, women directors—who have greater difficulty accessing these positions and who face a narrower labor market—must be particularly careful with their reputational capital (Godfrey et al., 2024), which leads them to advocate for avoiding environmentally damaging actions (Giannarakis et al., 2023; Oyewo, 2023; Shakil et al., 2021; Arayssi et al., 2020; Nadeem et al., 2020).

3.2. Positive impact of female directors on environmental violations

The presence of female directors may, nevertheless, encourage harmful environmental practices, and their appointment may have a merely symbolic role or impair the effectiveness of the board. From an attribution perspective, female directors can be used as instruments to mitigate any negative impact on the firm when environmental violations are uncovered. Consequently, female directors can be a mechanism to increase stakeholder confidence such that the latter react less negatively to unethical performance (Nirino et al., 2021). As a result, female directors act as moral capital and as an insurance policy to protect the firm from the negative effects of environmental violations by giving the company “the benefit of the doubt” regarding its true intentions (Shiu and Yang, 2017; Borghesi et al., 2014; Godfrey, 2005; Klein and Dawar, 2004).

Board gender diversity may also be a factor that encourages poor environmental practices due to the presence of fault lines on the board, i.e., hypothetical lines that divide the board into subgroups

based on their demographic characteristics (Mäs et al., 2013; Lau & Murnighan, 1998). The presence of fault lines leads to poorer board performance and less communication among board members (Thatcher et al., 2003). Any fault lines that could arise between different subgroups in a diverse board may therefore separate and complicate cohesion and communication due to categorization, stereotypes, and biases (Arena et al., 2024; Leicht-Deobald et al., 2021; Wu et al., 2021; Crucke & Knockaert, 2016; Carton & Cummings, 2012). In this setting, conflicts emerge between subgroups and can polarize opinions and reduce coordination, information sharing, and idea creation (Sun et al., 2023; Pearsall et al., 2008). This can lead to divergent views on firms' social performance (Ma & Huang, 2023; Ludwig & Sassen, 2022; Endrikat et al., 2021; Byron & Post, 2016) and diminish the board's ability to respond to stakeholder demands (Vandebeek et al., 2021; Donaldson et al., 2020). Accordingly, we state the following hypothesis:

H: Board gender diversity affects the occurrence of environmental violations.

Ha: Board gender diversity negatively affects the occurrence of environmental violations.

Hb: Board gender diversity positively affects the occurrence of environmental violations.

4. Research design

4.1. Sample

This study employed a sample of non-financial companies listed in the STOXX Europe 600 index over the period 2016–2022. This resulted in an unbalanced panel comprising 3,172 firm-year observations, with 98.03% of firms having five or more observations. Previous literature has widely used the composition of this stock index to analyze the impact of gender diversity on the environmental performance of European firms (Abu Alia et al., 2024; Issa and In'airat, 2024; Giannarakis et al., 2023). The advantages of the STOXX Europe 600 index include its representativeness and amplitude, as it comprises firms from 17 European countries, covering approximately 90% of European market capitalization. In addition, this index includes companies of different sizes and a broad spectrum of sectors as well as firms from different jurisdictions and regulatory systems. The index thus provides a comprehensive view of the European market and allows us to study how boards of directors affect firms' environmental performance. To mitigate the impact of outliers on continuous variables, we apply winsorization at the 1st and 99th percentiles.

4.2. Variables

4.2.1. Environmental violations

Consistent with previous literature, we collected data on environmental violations and other regulatory actions from the Violation Tracker database belonging to the non-profit organization Good Jobs First (Duan et al., 2024; Foulon & Marsat, 2023; Raghunandan & Rajgopal, 2022; Wu et al., 2021; Wang et al., 2020; Du, 2015). We used the variable to measure environmental violations—VIOL.ENV—defined as the natural logarithm of one plus the number of environmental fines in year *t*. Penalties are due to firms' violations related to environmental offenses, toxic waste actions, energy conservation violations, maritime violations, nuclear safety, offshore drilling, and zoning violations.

Environmental fines imposed on firms are a direct and effective proxy for studying environmental misbehavior because they represent an official and sanctioned response to clear violations of environmental laws and regulations, making them verifiable and quantifiable indicators of harmful practices. In addition, they facilitate objective comparison and analysis between different companies and sectors. Moreover, unlike corporate social responsibility (CSR) initiatives, which can be manipulated to improve the image without actual substantial changes in practices, fines reflect real and sanctioned problems, thus avoiding greenwashing.

4.2.2. Female directors

Consistent with previous literature, we used two variables widely used in the literature to measure gender diversity. First, the variable WOMEN is defined as the percentage of female directors over the total number of board seats. The number of female directors for the period under study was obtained from each corporate governance report of each company analyzed for each year. Second, we used the variable BLAU, which is a measure of diversity that reflects equity in gender distribution (Blau, 1977). This is widely used in the literature to represent gender diversity (Pucheta-Martínez & Bel-Oms, 2019; Al-Shaer & Zaman, 2016; Kılıç & Kuzey, 2016) and varies from 0 (no diversity, all the same gender) to 0.5 (maximum diversity for two genders). The Blau index is calculated with the following formula:

$$Blau\ index = 1 - \sum_{i=1}^k p_i^2$$

where p_i is the proportion of each gender in the board.

4.2.3. Control variables

The remaining variables include specific characteristics considered in previous research that are expected to determine corporate environmental behaviors. We included firm size (SIZE) since larger firms are more likely to promote bad organizational behaviors (Godfrey et al., 2024; Markoczy et al., 2023). The literature also positively relates unethical behaviors to the use of debt, as a higher level of debt will increase financial risks and thus put pressure on short-term profits while also potentially increasing irresponsibility (Fleitas-Castillo et al., 2024; Kölbel et al., 2017). We therefore incorporated the level of leverage (DEBT) and estimated a positive impact on corporate social irresponsibility (CSI) episodes. We included the return on assets (ROA) variable as a measure of profitability because more profitable firms are less likely to engage in unethical actions (Markoczy et al., 2023; Gao & Yang, 2021). Board size (BOARD) may affect the firm's social conduct, although the relationship may show opposite signs. Larger boards are more likely to represent the interests of multiple stakeholders and have greater resources and capabilities (Zubeltzu-Jaka et al., 2020; Kock et al., 2012). Previous literature has reported inconclusive results regarding how the power of dominant owners impacts firms' social behavior (Bona-Sánchez et al., 2023; Pucheta-Martínez & Chiva-Ortells, 2018; Oh et al., 2017; Barnea & Rubin, 2010). We therefore controlled the power of dominant owners through the variable VOTING. We expected a negative coefficient for growth opportunities (MTB), since the higher the growth opportunities, the lower the need for irresponsible behaviors, with irresponsibility often being linked to scarcity. When more development opportunities are handed, managers tend to make more

responsible decisions, since they have the resources to achieve their goals in an ethical and sustainable way (Chen et al., 2022; Gao & Yang, 2021). All variables are defined in Table A1 in the appendix.

4.3. Baseline model

Equation 1 represents the baseline estimation model, where δ represents the sector effect, Θ the time effect, and ε the error term.

$$VIOL.ENV_{i,t} = \alpha + \beta_1 WOMEN_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 DEBT_{i,t} + \beta_4 ROA_{i,t} + \beta_5 BOARD_{i,t} + \beta_6 VOTING_{i,t} + \beta_7 MTB_{i,t} + \delta_j + \theta_t + \varepsilon_{i,t} \quad (1)$$

5. Empirical results and discussion

5.1. Distribution of the sample

Table 1 shows the distribution of the main sample data (firms, observations, fines, and female directors) distributed for each of the 17 STOXX Europe 600 index countries.

Table 1. Data by country.

Country	Number of companies	Number of observations	Fines (%)	Number of women directors (mean)	Women directors (%)
<i>Austria</i>	5	35	5.71	2.40	25.80
<i>Belgium</i>	9	63	12.70	3.76	30.43
<i>Denmark</i>	20	140	2.86	2.60	27.64
<i>Finland</i>	14	98	1.02	2.79	33.63
<i>France</i>	64	448	10.94	5.26	41.39
<i>Germany</i>	61	427	17.80	3.98	29.49
<i>Great Britain</i>	102	709	14.53	3.22	32.74
<i>Ireland</i>	7	49	24.49	3.16	25.01
<i>Italy</i>	24	168	6.55	3.61	33.13
<i>Luxembourg</i>	2	14	42.86	3.76	35.04
<i>Netherlands</i>	22	136	11.76	2.86	27.56
<i>Norway</i>	15	105	7.62	2.49	29.51
<i>Poland</i>	5	35	22.86	0.70	10.06
<i>Portugal</i>	4	28	0.00	2.89	18.44
<i>Spain</i>	18	126	2.38	3.49	29.63
<i>Sweden</i>	48	328	2.13	3.05	32.89
<i>Switzerland</i>	39	263	10.27	2.06	22.92
Total	459	3172			

5.2. Descriptive statistics

Table 2 shows the descriptive statistics for all the variables. Panel A shows how companies evolved in terms of gender diversity and environmental penalties, with data indicating ever-growing gender diversity. While 94.12% of companies had appointed at least one female director by 2016, this percentage had risen to 98.91% by 2023. In addition, 57.08% of firms had a critical mass of female directors since 2016, rising to 82.14% in 2023. As regards the presence of female directors, women represented an average of 24.88% of board seats in 2016, a percentage that grew to 36.22% in 2023. As for environmental fines, data reflect a reduction in the number of firms committing actions that damage the environment, with the percentage of firms who incurred at least one sanction falling from 15.69% in 2016 to 9.15% in 2023. However, the increase in the year of the COVID-19 pandemic is worthy of note. As regards the number of sanctions for these firms, the average remained constant at around two penalties per firm. Panels B and C provide a summary of the descriptive statistics for the variables used in the estimation models and the correlation matrix of all the variables. Given the low correlation between the primary variables of interest, multicollinearity is unlikely to affect our results, a fact further supported by the low Variance Inflation Factor values (VIF) (Studenmund, 1997).

Table 2. Descriptive statistics.

Panel A. Board gender diversity and environmental penalties							
	2016	2017	2018	2019	2020	2021	2022
<i>Firms with at least one female director (%)</i>	94.12	97.17	98.04	99.35	98.91	99.13	98.91
<i>Firms with a critical mass of female directors (%)</i>	57.08	62.75	66.45	72.55	76.91	80.83	82.14
<i>Percentage of female directors</i>	24.88	28.30	29.82	31.93	33.77	35.13	36.22
<i>Firms with at least one environmental penalty (&)</i>	15.69	12.85	12.42	11.76	12.20	9.15	9.15
<i>Environmental penalties (number)</i>	2.03	1.81	1.65	1.89	1.96	2.07	1.76
Panel B. Summary statistics							
	<i>Mean</i>	<i>Median</i>	<i>SD</i>	<i>1stQ</i>	<i>3rdQ</i>		
<i>VIOL.ENV</i>	1.12	0	3.59	0	0		
<i>WOMEN</i>	31.55	33.33	11.84	25.00	40.00		
<i>BLAU</i>	0.40	0.44	0.10	0.37	0.48		
<i>MASS3</i>	0.69	1.00	0.46	0.00	1.00		
<i>SIZE</i>	15.86	15.89	1.59	14.84	16.94		
<i>DEBT</i>	3.58	2.33	4.12	0.66	4.93		
<i>ROA</i>	9.13	8.03	7.72	5.04	12.46		
<i>BOARD</i>	2.32	2.30	0.32	2.07	2.48		
<i>VOTING</i>	24.26	16.2	20.57	7.75	35.00		
<i>MTB</i>	0.037	0.035	0.134	0.009	0.014		

Continued on next page

Panel C. Correlation matrix								
	<i>VIOL.ENV</i>	<i>WOMEN</i>	<i>SIZE</i>	<i>DEBT</i>	<i>ROA</i>	<i>BOARD</i>	<i>VOTING</i>	<i>VIF</i>
<i>WOMEN</i>	-0.010							1.04
<i>SIZE</i>	0.265***	0.157***						1.49
<i>DEBT</i>	0.009	0.034*	0.002					1.01
<i>ROA</i>	-0.074***	-0.033*	-0.315***	-0.023				1.13
<i>BOARD</i>	0.1175***	0.1061***	0.534***	0.024	-0.211***			1.37
<i>VOTING</i>	-0.068***	0.037**	0.032*	0.028	0.059***	0.015		1.02
<i>MTB</i>	-0.046**	-0.156***	-0.275***	-0.062***	0.138***	-0.205***	0.039*	1.08

*, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

5.3. Board gender diversity and environmental violations

5.3.1. Regression analysis

We ran an ordinary least squares (OLS) with fixed effects to estimate the relationship between board diversity and environmental violations, which is presented in Models 1–3 of Table 3. Accordingly, and as stated in our hypothesis Ha, the effect of diversity on environmental violations is both negative and significant. This result supports arguments linking board gender diversity to strengthening oversight, improving public perception, access to critical resources, enriching decisions, and promoting a culture of sustainability.

Table 3. Board gender diversity and environmental violations.

<i>Dependent variable</i>	<i>VIOL.ENV</i>		
	Model 1	Model 2	Model 3
<i>WOMEN</i>	-0.014** (-1.98)		
<i>BLAU</i>		-1.738** (-1.97)	
<i>MASS3</i>			-3.312** (-1.74)
<i>SIZE</i>	0.413*** (3.48)	0.411*** (3.45)	0.541*** (4.73)
<i>DEBT</i>	0.019 (1.09)	0.020 (1.12)	0.22 (1.34)
<i>ROA</i>	-0.002 (-0.25)	-0.002 (-0.22)	-0.007 (-0.01)
<i>BOARD</i>	-0.456 (-1.03)	-0.410 (-0.92)	-0.298 (-0.71)
<i>VOTING</i>	-0.008 (-1.20)	-0.008 (-1.23)	-0.008 (-1.35)
<i>MTB</i>	-0.685 (-0.61)	-0.659 (-0.59)	-0.010 (-0.08)

Continued on next page

<i>Dependent variable</i>	<i>VIOL.ENV</i>		
	Model 1	Model 2	Model 3
<i>Constant</i>	-1.003 (-0.39)	-0.808 (-0.31)	-3.277 (-1.54)
<i>Soft/hard effect</i>	Yes	Yes	Yes
<i>Industry effect</i>	Yes	Yes	Yes
<i>Year effect</i>	Yes	Yes	Yes
<i>Country effect</i>	Yes	Yes	Yes
<i>F test</i>	107.51***	108.7***	166.14***
<i>R-squared</i>	0.22	0.22	0.23
<i>No. of observations</i>	3172	3172	3172

*, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

5.3.2. Endogeneity

Endogeneity may be a problem because director appointments are not made randomly. Therefore, in Table 4, we used several estimation methods to address this potential problem. In line with Li & He (2023), Yang & Xue (2023), and Mather et al. (2021), we used I.WOMEN, which is defined as the average board diversity of other firms in the same industry and country for each year analyzed. The rationale for using this instrument is that companies within the same industry and country may demonstrate similar behaviors and be influenced by herd psychology when determining their board composition. Furthermore, there are no studies showing that the diversity of other firms in the same sector can directly influence firms' unethical behavior. In addition, the LM and C-D Wald H statistics indicate that the instruments used are relevant and that there is no correlation between the errors and the instrumental variables. To further validate the instrumental variable, we performed a regression of the instruments on environmental violations, which highlights the exclusion criterion. The coefficient of the instrument in this regression is not significant, as shown in Appendix Table A2.

First, we employed a TOBIT IV model to account for the fact that many firms do not engage in environmentally damaging practices, which leads to a censored dependent variable. Second, we used the two-stage least squares method (2SLS). Third, we ran Heckman's two-stage correction model to mitigate sample selection bias. In the first stage, we estimated the determinants of gender diversity using a probit model, modeling the probability that a firm is more gender diverse than the industry average as a function of the instrumental variable defined above, and estimating the lambda coefficient or non-selection risk. In the second stage, we used our main regression model and included the lambda coefficient, which describes the covariance between the unobserved factors in the selection equation and the outcome equation. When the Mills coefficient is not significant, it indicates there is no sample selection bias problem. Finally, we used the generalized method of moments (GMM) developed by Blundell & Bond (1998). This technique helps to address potential endogeneity issues arising from the simultaneity between board gender diversity and lack of accountability, as well as from uncontrolled individual heterogeneity. This accounts for problems caused by the absence of unobservable firm characteristics that could affect director appointments. For instance, appointments might be influenced by exogenous characteristics that might also impact firms' environmental violations, potentially leading to a spurious association between board gender diversity and environmental violations.

Table 4. Board gender diversity and environmental violations.

<i>Dependent variable</i>	<i>VIOL.ENV</i>										
	<i>TOBIT</i>			<i>2SLS</i>			<i>Heckman</i>		<i>GMM</i>		
	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
<i>WOMEN</i>	-0.004*** (-2.77)			-0.061*** (-2.34)			-0.019** (-2.49)		-0.012*** (-12.03)		
<i>BLAU</i>		-0.537*** (-2.76)			-8.079*** (-2.34)			-2.683** (-2.55)		-1.781*** (-11.10)	
<i>MASS3</i>			-0.173*** (-2.87)			-2.267** (-2.32)					-0.257*** (-9.98)
<i>SIZE</i>	0.055*** (4.88)	0.055*** (4.86)	0.058*** (9.14)	0.006*** (8.59)	0.665*** (8.55)	0.685*** (8.42)	0.653*** (10.87)	0.655*** (10.89)	0.134*** (8.219)	0.131*** (7.36)	0.081*** (5.75)
<i>DEBT</i>	0.0002 (1.63)	0.0002* (1.74)	0.002 (0.84)	0.005 (0.34)	0.006 (0.38)	-0.005 (-0.33)	0.001 (0.62)	0.001 (0.63)	0.0009*** (11.83)	0.001*** (15.77)	0.005*** (14.08)
<i>ROA</i>	-0.0005 (0.51)	-00005 (-0.57)	-0.005 (-0.54)	-0.004 (-0.41)	-0.284 (-0.84)	-0.005 (-0.47)	0.002 (0.72)	0.002 (0.71)	-0.013*** (-14.39)	-0.014*** (-18.27)	-0.011*** (-15.54)
<i>BOARD</i>	-0.041 (-0.82)	-0.031 (-0.59)	0.065 (1.38)	-0.0420 (-1.29)	-0.014*** (-3.60)	1.030 (1.49)	-0.331 (-1.10)	-0.328 (-1.10)	-0.293*** (-7.49)	-0.193*** (-4.91)	-0.082** (-2.13)
<i>VOTING</i>	-0.001* (-1.67)	-0.001* (-1.77)	-0.001*** (-3.06)	-0.013*** (-3.33)	-0.014*** (-3.60)	-0.014*** (-3.38)	-0.017*** (-4.65)	-0.017*** (-4.75)	-0.015*** (-6.75)	0.020*** (-8.98)	-0.007*** (-4.20)
<i>MTB</i>	-0.043 (-0.35)	-0.048 (-0.39)	0.068 (0.95)	-0.676 (-0.77)	-0.739 (-0.84)	0.989 (1.05)	-3.294 (-0.53)	-3.511 (-0.57)	-2.716*** (-17.81)	-2.623*** (-8.98)	-2.197*** (-13.17)
<i>Mill's Lambda</i>							-0.523 (-0.59)	-0.590 (-0.66)			
<i>Constant</i>	-0.040* (-1.81)	-0.341 (-1.59)	-0.707*** (-5.20)	-4.108*** (-2.66)	-3.024* (-1.71)	-8.098*** (-4.27)	-5.384*** (-5.53)	-4.927*** (-4.79)	5.684*** (2.51)	3.134*** (2.67)	1.995 (1.63)
<i>Soft/hard effect</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry effect</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year effect</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country effect</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

<i>Wald χ^2</i>	646.99***	94.59***	638.67***				343.22***	343.49***			
<i>Wald test of exogeneity</i>	6.48***	4.40**	5.72***								
<i>Log-likelihood</i>	-8716.92	1927.44	-1477.43								
<i>F test</i>				7.70***	7.78***	8.03***			47.55***	51.39***	59.04***
<i>LM statistic</i>				170.52***	167.68***	103.061***					
<i>C-D Wald H test</i>				193.13	183.17	98.01					
<i>M2</i>									0.81	0.80	0.83
<i>Hansen test</i>									155.19	161.89	150.77
<i>No. of observations</i>	3172	3172	3172	3172	3172	3172	3172	3172	3172	3172	3172

*, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

The results were consistent across all models, supporting our hypothesis H_a that the presence of female directors on boards is associated with a significant reduction in environmental violations. Female directors contribute to reducing environmental violations by strengthening oversight and control, thereby improving public perception of the firm, providing access to critical resources, enriching decision-making, and adopting a culture of sustainability. Although it is not possible to entirely eliminate all endogeneity problems, the results obtained through the different methods do confirm the main findings and demonstrate that they do not depend on the estimation method applied. As regards the control variables, results indicate that firm size and debt positively affect unethical behavior, while board size, firm profitability, level of ownership concentration, and investment opportunities reduce environmentally harmful behaviors.

5.3.3. Sensitivity analysis

In order to analyze the robustness of the results in Table 5, we divided the sample according to different corporate characteristics. First, Models 15 and 16 show the estimates by dividing the firms according to the size of their market value. Second, Models 17 and 18 separate the firms according to the level of media coverage. We thus considered the number of news items published for each firm through the Factiva database, separating firms into two groups: firms with high and low media coverage, depending on whether they have media attention above and below the median number of news items. Finally, in Models 19 and 20, firms are considered according to whether their activity is in regulated sectors (transportation, telecommunications, energy, or construction). The results in all cases are consistent with those obtained previously.

Table 5. Board gender diversity and environmental violations.

<i>Dependent variable</i>	<i>VIOL.ENV</i>					
	Model 15	Model 16	Model 17	Model 18	Model 19	Model 20
	Larger firms	Smaller firms	Firms with greater media coverage	Firms with less media coverage	Firms in regulated industries	Firms in non-regulated industries
<i>WOMEN</i>	-0.022*** (-3.96)	-0.004*** (-5.08)	-0.020*** (-3.32)	-0.017*** (-4.37)	-0.021*** (-8.32)	-0.014*** (-2.83)
<i>SIZE</i>	0.407*** (3.73)	0.219*** (6.90)	0.603*** (5.23)	0.173** (2.53)	0.636*** (7.85)	0.143** (2.12)
<i>DEBT</i>	0.032** (2.24)	0.001*** (6.34)	0.003*** (4.98)	0.004 (0.61)	0.010*** (4.89)	0.005 (1.12)
<i>ROA</i>	-0.019** (-2.13)	-0.005*** (-6.11)	0.004 (0.10)	-0.005 (-1.36)	-0.003 (-1.43)	-0.005 (-1.01)
<i>BOARD</i>	-1.117** (-2.47)	-0.813*** (-6.81)	-0.597** (-2.25)	-0.0075 (-0.39)	-0.415*** (-3.07)	-0.257 (-1.01)
<i>VOTING</i>	-0.004 (-0.69)	-0.015*** (-4.42)	-0.016 (-1.38)	-0.001 (-0.46)	-0.008*** (-4.18)	-0.022*** (-2.66)
<i>MTB</i>	-1.474* (-1.79)	-4.059*** (-6.43)	2.897*** (3.24)	1.268** (-2.58)	-3.992 (-0.85)	5.347 (0.12)
<i>Constant</i>	-4.813* (-1.85)	2.191* (1.91)	-3.495* (-1.72)	0.157 (0.50)	-5.988*** (-4.43)	2.455 (1.51)
<i>Soft/hard effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Industry effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Year effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Country effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>F test</i>	17.58***	79.44***	9.28***	17.00***	84.38***	26.79***
<i>M2</i>	1.33	-0.26	0.97	-0.84	-0.12	0.88
<i>Hansen test</i>	71.94	79.14	65.55	51.31	61.64	65.50
<i>No. of observations</i>	1626	1546	1653	1519	772	2400

*, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

6. Conclusions

Coupled with greater stakeholder concern for corporate actions that impact the environment, the increased presence of women on boards of directors has sharpened academic interest in boosting current knowledge of what effect female directors have on firms' environmental strategies. However, the role of board gender diversity vis-à-vis environmental violations remains a dark area of knowledge. Only the study of Liu (2018), which focused on the context of US firms—where the risk of litigation is high—directly explores the role of female directors in environmental misconduct, with said study showing a negative relationship between gender diversity and environmental violations. Yet this result cannot be directly extrapolated to the continental European setting, which is characterized by low

litigation risk, high ownership concentration, and the leading role of reputation as an instrument for disciplining internal stakeholders.

Accordingly, in this study, we explored what impact the presence of women on boards of directors might have on corporate performance, focusing especially on the environmental misconduct of European firms. Using different theoretical perspectives together with alternative estimation methods and subsamples of firms, our study demonstrates that board gender diversity reduces irresponsible performance that might lead to environmental violations. Consequently, the presence of women on the boards of European firms is shown to be a significant driver in reducing environmental violations. The results provide support for arguments that the presence of female directors can improve control over internal agents by reducing opportunistic and irresponsible behaviors. This role aligns with arguments that point to a greater concern for the reputation of female directors, as they face a narrow labor market. Additionally, results confirm the positive effects of having board members who display greater concern for ethical performance and for addressing stakeholder demands and—in a complementary approach—also suggest that a board composition evidencing a diversity of knowledge, characteristics, and qualities can reduce environmental misconduct. Furthermore, the appointment of female directors aids company legitimacy, as it reduces the risk of engaging in unethical environmental practices and thereby increases the firm's possibilities of long-term sustainability.

Our research has important implications for policymakers and practitioners alike. By improving our understanding of how and why the inclusion of women on boards can influence firms' environmental performance, we can develop more effective strategies to promote responsible and sustainable corporate governance in the future. The results thus provide support for Directive (EU) 2022/2381, which sets a target of 40% female directors in European listed firms by 2026. As such, findings suggest that establishing gender quotas or other instruments that incentivize the appointment of female directors in other settings may help to reduce unethical environmental performance. For all other stakeholders, the results indicate that firms with a greater presence of female directors are more responsive to the demands of environmentally responsible corporate activity. For managers and controlling owners, the results indicate that the appointment of female directors limits opportunistic practices and signals to all stakeholders the company's commitment to reducing environmental risks related to corporate activity. Consequently, appointing female directors can increase the firm's appeal to a broader set of environmentally conscious investors and consumers and thereby boost the firm's long-term sustainability. In addition, lower environmental risk can reduce the probability of facing stricter regulatory inspections, license suspensions, or restrictions, thus protecting business continuity and stability.

Nevertheless, our study does evidence certain limitations. Although the use of penalties offers advantages related to objectivity and the use of a quantitative measure of unethical performance, such fines may not fully reflect firms' environmentally responsible actions. Additionally, although we explore the role of female directors as a homogeneous group, it might be enlightening to consider certain characteristics of female directors, such as their seniority in the firm, their ties to controlling shareholders, or their educational background. Future research may therefore seek to shed light on which characteristics of female directors are more closely linked to environmental misconduct. Future inquiry might also explore the role of female directors in environmental strategies in firms that are dominated by families or institutional investors. Furthermore, it would be of interest to investigate this relationship in the Asian setting and in emerging countries in order to bring the board gender diversity–environmental violations relationship out of the dark.

Author contributions

All authors have contributed equally to the development and writing of this article.

Use of AI tools declaration

The authors declare they have not used artificial intelligence (AI) tools in the creation of this article.

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Conflict of interest

All the authors declare no conflicts of interest in this paper.

References

- Abebe MA, Acharya K (2022) Founder CEOs and corporate environmental violations: Evidence from S&P 1500 firms. *Bus Strategy Environ* 31: 1204–1219. <https://doi.org/10.1002/bse.2950>
- Abu Alia M, Dwekat A, Meqbel R, et al. (2024) Can effective board drive environmental innovation? The moderating power of CSR committee. *J Financ Report Account* <https://doi.org/10.1108/JFRA-05-2024-0280>
- Adams R B, De Haan J, Terjesen S, et al. (2015) Board diversity: Moving the field forward. *Corp Gov* 23: 77–82. <https://doi.org/10.1111/corg.12106>
- Adams RB, Ferreira D (2009) Women in the boardroom and their impact on governance and performance. *J Financ Econ* 94: 291–309. <https://doi.org/10.1016/j.jfineco.2008.10.007>
- Ain QU, Yuan X, Javaid HM, et al. (2021) Female directors and agency costs: evidence from Chinese listed firms. *Int J Emerg Mark* 16: 1604–1633. <https://doi.org/10.1108/IJOEM-10-2019-0818>
- Al Amosh H (2024a) Stakeholder theory in elections: Navigating political money, tribal tendencies, ethics, and the dark side of stakeholders. *Polit Policy* 52: 828–853. <https://doi.org/10.1111/polp.12610>
- Al Amosh H (2024b) From home to boardroom: Marital status and its influence on ESG disclosure. *Bus Strategy Dev* 7: e402. <https://doi.org/10.1002/bsd2.402>
- Al Amosh H, Khatib SF (2023) ESG performance in the time of COVID-19 pandemic: Cross-country evidence. *Environ Sci Pollut Res* 30: 39978–39993. <https://doi.org/10.1007/s11356-022-25050-w>
- Ali M, Ng YL, Kulik CT (2014) Board age and gender diversity: A test of competing linear and curvilinear predictions. *J Bus Ethics* 125: 497–512. <https://doi.org/10.1007/s10551-013-1930-9>
- Al-Shaer, H, Zaman, M. (2016) Board gender diversity and sustainability reporting quality. *J Contemp Account Econ* 12: 210–222. <https://doi.org/10.1016/j.jcae.2016.09.001>

- Amin A, Ali R, ur Rehman R, et al. (2023) Gender diversity in the board room and sustainable growth rate: The moderating role of family ownership. *J Sustain Financ Invest* 13: 1577–1599. <https://doi.org/10.1080/20430795.2022.2138695>
- Amorelli MF, García-Sánchez IM (2020) Critical mass of female directors, human capital, and stakeholder engagement by corporate social reporting. *Corp Soc Resp Env Ma* 27: 204–221. <https://doi.org/10.1002/csr.1793>
- Ananzeh H, Al Shbail MO, Alshurafat H, et al. (2024) A cross-country examination on the relationship between cash holding, dividend policies, and the moderating role of ESG ratings. *Cogent Bus Manag* 11: 2300523. <https://doi.org/10.1080/23311975.2023.2300523>
- Arayssi M, Jizi M, Tabaja HH (2020) The impact of board composition on the level of ESG disclosures in GCC countries. *Sustain Account Manag Policy J* 11: 137–161. <https://doi.org/10.1108/SAMPJ-05-2018-0136>
- Arena C, Garcia-Torea N, Michelon G (2024) The lines that divide: Board demographic faultlines and proactive environmental strategy. *Corp Gov Int Rev* 32: 833–855. <https://doi.org/10.1111/corg.12570>
- Atay E, Terpstra-Tong JLY (2020) The determinants of corporate social irresponsibility: A case study of the Soma mine accident in Turkey. *Soc Responsib J* 16: 1433–1452. <https://doi.org/10.1108/SRJ-01-2019-0042>
- Baker HK, Pandey N, Kumar S, et al. (2020) A bibliometric analysis of board diversity: Current status, development, and future research directions. *J Bus Res* 108: 232–246. <https://doi.org/10.1016/j.jbusres.2019.11.025>
- Barnea A, Rubin A (2010) Corporate Social Responsibility as a Conflict Between Shareholders. *J Bus Ethics* 97: 71–86. <https://doi.org/10.1007/s10551-010-0496-z>
- Bell DA (2010) Reconciling socialism and Confucianism? Reviving tradition in China. *Dissent* 57: 91–99. <https://doi.org/10.1353/dss.0.0114>
- Berrone P, Cruz C, Gomez-Mejia LR (2012) Socioemotional wealth in family firms: Theoretical dimensions, assessment approaches, and agenda for future research. *Fam Bus Rev* 25: 258–279. <https://doi.org/10.1177/0894486511435355>
- Bhandari A, Javakhadze D (2017) Corporate social responsibility and capital allocation efficiency. *J Corp Financ* 43: 354–377. <https://doi.org/10.1016/j.jcorpfin.2017.01.012>
- Birindelli G, Chiappini H, Jalal RNUD (2024) Greenwashing, bank financial performance and the moderating role of gender diversity. *Res Int Bus Financ* 69: 102–235. <https://doi.org/10.1016/j.ribaf.2024.102235>
- Blau PM (1977) A macrosociological theory of social structure. *Am J Sociol* 83: 26–54. <https://doi.org/10.1086/226505>
- Blundell R, Bond S (1998) Initial conditions and moment restrictions in dynamic panel data models. *J Econom* 87: 115–143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
- Bolton P, Kacperczyk M (2021) Do investors care about carbon risk? *J Financ Econ* 142: 517–549. <https://doi.org/10.1016/j.jfineco.2021.05.008>
- Bona-Sánchez C, Pérez-Alemán J, Santana-Martín DJ (2023) Media visibility and corporate social responsibility investment evidence in Spain. *Bus Ethics Environ Responsib* 32: 94–107. <https://doi.org/10.1111/beer.12488>

- Borghesi R, Houston JF, Naranjo A (2014) Corporate socially responsible investments: CEO altruism, reputation, and shareholder interests. *J Corp Financ* 26: 164–181. <https://doi.org/10.1016/j.jcorpfin.2014.03.008>
- Bouckaert S, Pales AF, McGlade C, et al. (2021) Net zero by 2050: A roadmap for the global energy sector. *Int Energy Agency*. <https://doi.org/10.1787/c8328405-en>
- Boudier F, Bensebaa F (2011) Hazardous waste management and corporate social responsibility: illegal trade of electrical and electronic waste. *Bus Soc Rev* 116: 29–53. <https://doi.org/10.1111/j.1467-8594.2011.00376.x>
- Briano-Turrent GDC (2022) Female representation on boards and corporate ethical behavior in Latin American companies. *Corp Gov* 30: 80–95. <https://doi.org/10.1111/corg.12416>
- Byron K, Post C (2016) Women on boards of directors and corporate social performance: A meta-analysis. *Corp Gov Int Rev* 24: 428–442. <https://doi.org/10.1111/corg.12165>
- Campbell JL (2007) Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility. *Acad Manage Rev* 32: 946–967. <https://doi.org/10.5465/amr.2007.25275684>
- Carney RW, Child TB (2013) Changes to the ownership and control of East Asian corporations between 1996 and 2008: The primacy of politics. *J Financ Econ* 107: 494–513. <https://doi.org/10.1016/j.jfineco.2012.08.013>
- Carton AM, Cummings JN (2012) A theory of subgroups in work teams. *Acad Manage Rev* 37: 441–470. <https://doi.org/10.5465/amr.2009.0322>
- Carvajal M, Nadeem M, Zaman R (2022) Biodiversity disclosure, sustainable development and environmental initiatives: Does board gender diversity matter? *Bus Strat Environ* 31: 969–987. <https://doi.org/10.1002/bse.2929>
- Chen J, Fan Y, Zhang X (2022) Rookie independent directors and corporate fraud in China. *Financ Res Lett* 46: 102411. <https://doi.org/10.1016/j.frl.2021.102411>
- Chen P, Dagestani AA (2023) Greenwashing behavior and firm value—From the perspective of board characteristics. *Corp Soc Responsib Environ Manag* 30: 2330–2343. <https://doi.org/10.1002/csr.2488>
- Cheng IH, Hong H, Shue K (2023) Do managers do good with other people’s money? *Rev Corp Financ Stud* 12: 443–487. <https://doi.org/10.1093/rcfs/cfad008>
- Claessens S, Djankov S, Lang LH (2000) The separation of ownership and control in East Asian corporations. *J Financ Econ* 58: 81–112. [https://doi.org/10.1016/S0304-405X\(00\)00067-2](https://doi.org/10.1016/S0304-405X(00)00067-2)
- Clark CE, Riera M, Iborra M (2022) Toward a theoretical framework of corporate social irresponsibility: Clarifying the gray zones between responsibility and irresponsibility. *Bus Soc* 61: 1473–1511. <https://doi.org/10.1177/00076503211015911>
- Cox TH, Blake S (1991) Managing cultural diversity: Implications for organizational competitiveness. *Acad Manag Perspect* 5: 45–56. <https://doi.org/10.5465/ame.1991.4274465>
- Crucke S, Knockaert M (2016) When stakeholder representation leads to faultlines. A study of board service performance in social enterprises. *J Manage Stud* 53: 768–793. <https://doi.org/10.1111/joms.12197>
- Cuervo A (2002) Corporate governance mechanisms: A plea for less code of good governance and more market control. *Corp Gov Int Rev* 10: 84–93. <https://doi.org/10.1111/1467-8683.00272>
- Cumming D, Leung TY, Rui O (2015) Gender diversity and securities fraud. *Acad Manage J* 58: 1572–1593. <https://doi.org/10.5465/amj.2013.0750>

- Darnall N, Henriques I, Sadorsky P (2008) Do environmental management systems improve business performance in an international setting? *J Int Manag* 14: 364–376. <https://doi.org/10.1016/j.intman.2007.09.006>
- Delmas MA, Pekovic S (2013) Environmental standards and labor productivity: Understanding the mechanisms that sustain sustainability. *J Organ Behav* 34: 230–252. <https://doi.org/10.1002/job.1827>
- Delmas MA, Toffel MW (2008) Organizational responses to environmental demands: Opening the black box. *Strateg Manage J* 29: 1027–1055. <https://doi.org/10.1002/smj.701>
- Deloitte. (2024) Women in the Boardroom, eighth edition. Deloitte. Available from: <https://www2.deloitte.com/us/en/insights/topics/leadership/women-in-the-boardroom.html>.
- Djankov S, La Porta R, Lopez-de-Silanes F, et al. (2008) The law and economics of self-dealing. *J Financ Econ* 88:430–446. <https://doi.org/10.1016/j.jfineco.2007.02.007>
- Donaldson JR, Malenko N, Piacentino G (2020) Deadlock on the board. *Rev Financ Stud* 33: 4445–4488. <https://doi.org/10.1093/rfs/hhaa006>
- Du X (2015) Is corporate philanthropy used as environmental misconduct dressing? Evidence from Chinese family-owned firms. *J Bus Ethics* 129: 341–361. <https://doi.org/10.1007/s10551-014-2163-2>
- Du J, Dai Y (2005) Ultimate corporate ownership structures and capital structures: Evidence from East Asian economies. *Corp Gov Int Rev* 13: 60–71. <https://doi.org/10.1111/j.1467-8683.2005.00403.x>
- Du X, Weng J, Zeng Q, et al. (2017) Do lenders applaud corporate environmental performance? Evidence from Chinese private-owned firms. *J Bus Ethics* 143: 179–207. <https://doi.org/10.1007/s10551-015-2758-2>
- Duan H, Rogers C, Wang J, et al (2024) Do big shifts in economic development incentives attract people? *Econ Lett* 234: 111451. <https://doi.org/10.1016/j.econlet.2023.111451>
- Eccles RG, Ioannou I, Serafeim G (2014) The impact of corporate sustainability on organizational processes and performance. *Manage Sci* 60: 2835–2857. <https://doi.org/10.1287/mnsc.2014.1984>
- Eliwa Y, Aboud A, Saleh A (2023) Board gender diversity and ESG decoupling: Does religiosity matter? *Bus Strateg Environ* 32: 4046–4067. <https://doi.org/10.1002/bse.3353>
- Endrikat J, De Villiers C, Guenther TW, et al. (2021) Board characteristics and corporate social responsibility: A meta-analytic investigation. *Bus Soc* 60: 2099–2135. <https://doi.org/10.1177/0007650320930638>
- Esterhuysen L (2020) Towards corporate transparency: The link between inclusion in a socially responsible investment index and investor relations practices. *Bottom Line* 32: 290–307. <https://doi.org/10.1108/BL-03-2019-0081>
- Feng C, Xiang K (2023) Structural power of female executives and retailer profitability: A contingent resource-based perspective. *J Bus Res* 168: 114137. <https://doi.org/10.1016/j.jbusres.2023.114137>
- Fernando CS, Sharfman MP, Uysal VB (2017) Corporate environmental policy and shareholder value: Following the smart money. *J Financ Quant Anal* 52: 2023–2051. <https://doi.org/10.1017/S0022109017000680>
- Ferrell A, Liang H, Renneboog L (2016) Socially responsible firms. *J Financ Econ* 122: 585–606. <https://doi.org/10.1016/j.jfineco.2015.12.003>
- Fields S (2002) Sustainable business makes dollars and sense. *Environ Health Perspect* 110: 142–145. <https://doi.org/10.1289/ehp.110-a142>
- Flammer C (2013) Corporate social responsibility and shareholder reaction: The environmental awareness of investors. *Acad Manage J* 56: 758–781. <https://doi.org/10.5465/amj.2011.0744>

- Flammer C (2015) Does corporate social responsibility lead to superior financial performance? A regression discontinuity approach. *Manage Sci* 61: 2549–2568. <https://doi.org/10.1287/mnsc.2014.2038>
- Flammer C (2021) Corporate green bonds. *J Financ Econ* 142: 499–516. <https://doi.org/10.1016/j.jfineco.2021.01.010>
- Fleitas-Castillo GC, Peña-Martel D, Pérez-Alemán J, et al. (2024) Board gender diversity and corporate social irresponsibility in a dominant owner context. *Corp Soc Responsib Environ Manag*. <https://doi.org/10.1002/csr.2851>
- Foulon B, Marsat S (2023) Does environmental footprint influence the resilience of firms facing environmental penalties? *Bus Strateg Environ* 32: 6154–6168. <https://doi.org/10.1002/bse.3478>
- Gao Y, Yang H (2021) Does Ownership Matter? Firm Ownership and Corporate Illegality in China. *J Bus Ethics* 168: 431–445. <https://doi.org/10.1007/s10551-019-04264-y>
- García-Meca E, López-Iturriaga FJ, Santana-Martín DJ (2022) Board gender diversity and dividend payout: The critical mass and the family ties effect. *Int Rev Financ Anal* 79: 101973. <https://doi.org/10.1016/j.irfa.2021.101973>
- García-Sánchez IM, Aibar-Guzmán C, Núñez-Torrado M, et al. (2023) Women leaders and female same-sex groups: The same 2030 Agenda objectives along different roads. *J Bus Res* 157: 113582. <https://doi.org/10.1016/j.jbusres.2022.113582>
- García-Sánchez IM, Cuadrado-Ballesteros B, Frias-Aceituno JV (2016) Impact of the institutional macro context on the voluntary disclosure of CSR information. *Long Range Plan* 49: 15–35. <https://doi.org/10.1016/j.lrp.2015.02.004>
- Giannarakis G, Andronikidis A, Zopounidis C, et al. (2023) Determinants of Global Reporting Initiative report: A comparative study between USA and European companies. *Sustain Prod Consump* 35: 376–387. <https://doi.org/10.1016/j.spc.2022.11.014>
- Gilson SC (1990) Bankruptcy, boards, banks, and blockholders: Evidence on changes in corporate ownership and control when firms default. *J Financ Econ* 27: 355–387. [https://doi.org/10.1016/0304-405X\(90\)90060-D](https://doi.org/10.1016/0304-405X(90)90060-D)
- Godfrey C, Hoepner AG, Lin MT, et al. (2024) Women on boards and corporate social irresponsibility: evidence from a Granger style reverse causality minimisation procedure. *Eur J Financ* 30: 1–27. <https://doi.org/10.1080/1351847X.2020.1841664>
- Godfrey PC (2005) The relationship between corporate philanthropy and shareholder wealth: A risk management perspective. *Acad Manage Rev* 30: 777–798. <https://doi.org/10.5465/amr.2005.18378878>
- Graham ME, Belliveau MA, Hotchkiss JL (2017) The view at the top or signing at the bottom? Workplace diversity responsibility and women’s representation in management. *ILR Rev* 70: 223–258. <https://doi.org/10.1177/0019793916668879>
- Gul FA, Srinidhi B, Ng AC (2011) Does board gender diversity improve the informativeness of stock prices? *J Account Econ* 51: 314–338. <https://doi.org/10.1016/j.jacceco.2011.01.005>
- Gull AA, Nekhili M, Nagati H, et al. (2018) Beyond gender diversity: How specific attributes of female directors affect earnings management. *Brit Account Rev* 50: 255–274. <https://doi.org/10.1016/j.bar.2017.09.001>
- Hafsi T, Turgut G (2013) Boardroom diversity and its effect on social performance: Conceptualization and empirical evidence. *J Bus Ethics* 112: 463–479. <https://doi.org/10.1007/s10551-012-1272-z>

- He Z (2023) History and freedom: Two corresponding facets of Marxism and Confucianism. *Front Philos China* 18: 191–209. <https://doi.org/10.3868/s030-012-023-0011-3>
- Henry LA, Buyl T, Jansen RJ (2019) Leading corporate sustainability: The role of top management team composition for triple bottom line performance. *Bus Strateg Environ* 28: 173–184. <https://doi.org/10.1002/bse.2247>
- Herzig C, Moon J (2013) Discourses on corporate social ir/responsibility in the financial sector. *J Bus Res* 66: 1870–1880. <https://doi.org/10.1016/j.jbusres.2013.02.008>
- Ioannou I, Serafeim G (2015) The impact of corporate social responsibility on investment recommendations: Analysts' perceptions and shifting institutional logics. *Strateg Manage J* 36: 1053–1081. <https://doi.org/10.1002/smj.2268>
- Issa A, In'airat M (2024) From words to action: Unpacking the real impact of sustainability initiatives on carbon emissions reduction. *Soc Responsib J* 20: 585–604. <https://doi.org/10.1108/SRJ-06-2023-0320>
- Iwasaki I, Ma X, Mizobata S (2024) Board gender diversity in China and Eastern Europe. *Asia Glob Econ* 4: 100077. <https://doi.org/10.1016/j.aglobe.2024.100077>
- Javeed SA, Teh BH, Ong TS, et al. (2022) How does green innovation strategy influence corporate financing? Corporate social responsibility and gender diversity play a moderating role. *Int J Environ Res Public Health* 19: 8724. <https://doi.org/10.3390/ijerph19148724>
- Jiang X (2009) Confucianism, women, and social contexts. *J Chin Philos* 36: 228–242. <https://doi.org/10.1163/15406253-03602005>
- Kamil R, Appiah KO (2022) Board gender diversity and cost of debt: do firm size and industry type matter? *Gend Manag* 37: 19–38. <https://doi.org/10.1108/GM-12-2020-0363>
- Kamran M, Djajadikerta HG, Mat Roni S, et al. (2023) Board gender diversity and corporate social responsibility in an international setting. *J Account Emerg Econ* 13: 240–275. <https://doi.org/10.1108/JAEE-05-2021-0140>
- Kassinis G, Panayiotou A, Dimou A, et al. (2016) Gender and environmental sustainability: A longitudinal analysis. *Corp Soc Responsib Environ Manag* 23: 399–412. <https://doi.org/10.1002/csr.1386>
- Kassinis G, Vafeas N (2002) Corporate boards and outside stakeholders as determinants of environmental litigation. *Strateg Manage J* 23: 399–415. <https://doi.org/10.1002/smj.230>
- Kazim I, Wang F, Zhang X (2024) Unlocking the link: Foreign-experienced board of directors and environmental violations in China. *Finance Res Lett* 60: 104912. <https://doi.org/10.1016/j.frl.2023.104912>
- Keig DL, Brouters LE, Marshall VB (2015) Formal and informal corruption environments and multinational enterprise social irresponsibility. *J Manage Stud* 52: 89–116. <https://doi.org/10.1111/joms.12102>
- Kikwiye IR (2019) The nature and extent of corporate social responsibility disclosure in Tanzania. *Bus Strateg Dev* 2: 253–264. <https://doi.org/10.1002/bsd2.62>
- Kılıç M, Kuzey C (2016) The effect of board gender diversity on firm performance: evidence from Turkey. *Gend Manag* 31: 434–455. <https://doi.org/10.1108/GM-10-2015-0088>
- Klein J, Dawar N (2004) Corporate social responsibility and consumers' attributions and brand evaluations in a product-harm crisis. *Int J Res Mark* 21: 203–217. <https://doi.org/10.1016/j.ijresmar.2003.12.003>

- Kock CJ, Santaló J, Diestre L (2012) Corporate governance and the environment: what type of governance creates greener companies? *J Manage Stud* 49: 492–514. <https://doi.org/10.1111/j.1467-6486.2010.00993.x>
- Kölbel JF, Busch T, Jancso LM (2017) How media coverage of corporate social irresponsibility increases financial risk. *Strateg Manage J* 38: 2266–2284. <https://doi.org/10.1002/smj.2647>
- Krishnan HA, Park D (2005) A few good women—on top management teams. *J Bus Res* 58: 1712–1720. <https://doi.org/10.1016/j.jbusres.2004.09.003>
- Krueger P, Sautner Z, Starks LT (2020) The importance of climate risks for institutional investors. *Rev Financ Stud* 33: 1067–1111. <https://doi.org/10.1093/rfs/hhz137>
- Krüger P (2015) Corporate goodness and shareholder wealth. *J Financ Econ* 115: 304–329. <https://doi.org/10.1016/j.jfineco.2014.09.008>
- Kyaw K, Treepongkaruna S, Jiraporn P (2022) Board gender diversity and environmental emissions. *Bus Strateg Environ* 31: 2871–2881. <https://doi.org/10.1002/bse.3052>
- La Porta RL, Lopez-de-Silanes F, Shleifer A, et al. (1998) Law and finance. *J Polit Econ* 106: 1113–1155. <https://doi.org/10.1086/250042>
- La Porta R, Lopez de Silanes F, Shleifer A (1999) Corporate ownership around the world. *J Financ* 54: 471–517. <https://doi.org/10.1111/0022-1082.00115>
- La Porta R, Lopez-de-Silanes F, Shleifer A, et al. (2000) Agency problems and dividend policies around the world. *J Financ* 55:1–33. <https://doi.org/10.1111/0022-1082.00199>
- Laique U, Abdullah F, Rehman IU, et al. (2023) Two decades of research on board gender diversity and financial outcomes: Mapping heterogeneity and future research agenda. *Corp Soc Responsib Environ Manag* 30: 2121–2144. <https://doi.org/10.1002/csr.2510>
- Lau DC, Murnighan JK (1998) Demographic diversity and faultlines: The compositional dynamics of organizational groups. *Acad Manage Rev* 23: 325–340. <https://doi.org/10.5465/amr.1998.533229>
- Laufer WS (2003) Social accountability and corporate greenwashing. *J Bus Ethics* 43: 253–261. <https://doi.org/10.1023/A:1022962719299>
- Leicht-Deobald U, Huettermann H, Bruch H, et al. (2021) Organizational demographic faultlines: Their impact on collective organizational identification, firm performance, and firm innovation. *J Manage Stud* 58: 2240–2274. <https://doi.org/10.1111/joms.12747>
- Levi M, Li K, Zhang F (2014) Director gender and mergers and acquisitions. *J Corp Financ* 28: 185–200. <https://doi.org/10.1016/j.jcorpfin.2013.11.005>
- Li YX, He C (2023) Board diversity and corporate innovation: Evidence from Chinese listed firms. *Int J Financ Econ* 28: 1092–1115. <https://doi.org/10.1002/ijfe.2465>
- Liao L, Luo L, Tang Q (2015) Gender diversity, board independence, environmental committee and greenhouse gas disclosure. *Brit Account Rev* 47: 409–424. <https://doi.org/10.1016/j.bar.2014.01.002>
- Liao Z, Zhang M (2024) Regulatory distance and firms' environmental innovation: The role of environmental information disclosure and social trust. *Bus Strateg Environ* [In press]. <https://doi.org/10.1002/bse.3771>
- Liu C (2018) Are women greener? Corporate gender diversity and environmental violations. *J Corp Financ* 52: 118–142. <https://doi.org/10.1016/j.jcorpfin.2018.08.004>
- Liu Y, Wei Z, Xie F (2014) Do women directors improve firm performance in China? *J Corp Financ* 28: 169–184. <https://doi.org/10.1016/j.jcorpfin.2013.11.016>

- Lu J, Herremans IM (2019) Board gender diversity and environmental performance: An industries perspective. *Bus Strateg Environ* 28: 1449–1464. <https://doi.org/10.1002/bse.2326>
- Lucas-Pérez ME, Mínguez-Vera A, Baixauli-Soler JS, et al. (2015) Women on the board and managers' pay: Evidence from Spain. *J Bus Ethics* 129: 265–280. <https://doi.org/10.1007/s10551-014-2148-1>
- Ludwig P, Sassen R (2022) Which internal corporate governance mechanisms drive corporate sustainability? *J Environ Manag* 301: 113780. <https://doi.org/10.1016/j.jenvman.2021.113780>
- Ma J, Huang X (2023) Knowledge-Based Faultlines and Corporate Social Irresponsibility: Evidence from Chinese High-Polluting Companies. *Sustainability* 15: 13156. <https://doi.org/10.3390/su151713156>
- Ma R, Ji Q, Zhai P, Yang R (2022) Environmental violations, refinancing risk, and the corporate bond cost in China. *J Int Financ Manage Account* 33: 480–504. <https://doi.org/10.1111/jifm.12154>
- Markoczy L, Kolev KD, Qian C (2023) Trade-off among stakeholders: CEO political orientation and corporate social irresponsibility. *Long Range Plan* 56: 102273. <https://doi.org/10.1016/j.lrp.2022.102273>
- Martínez-García I, Terjesen S, Gómez-Ansón S (2022). Board gender diversity codes, quotas and threats of supranational legislation: impact on director characteristics and corporate outcomes. *Brit J Manage* 33: 753–783. <https://doi.org/10.1111/1467-8551.12517>
- Mäs M, Flache A, Takács K, et al. (2013) In the short term we divide, in the long term we unite: Demographic crisscrossing and the effects of faultlines on subgroup polarization. *Organ Sci* 24: 716–736. <https://doi.org/10.1287/orsc.1120.0767>
- Maswadi L, Amran A (2023) Does board capital enhance corporate social responsibility disclosure quality? The role of CEO power. *Corp Soc Responsib Environ Manag* 30: 209–225. <https://doi.org/10.1002/csr.2349>
- Matejek S, Gössling T (2014) Beyond legitimacy: A case study in BP's "green lashing". *J Bus Ethics* 120: 571–584. <https://doi.org/10.1007/s10551-013-2006-6>
- Mather P, Ranasinghe D, Unda LA (2021) Are gender diverse boards more cautious? The impact of board gender diversity on sentiment in earnings press releases. *J Contemp Account Econ* 17: 100278. <https://doi.org/10.1016/j.jcae.2021.100278>
- Matten D, Moon J (2005) Pan-European approach: A conceptual framework for understanding CSR, In: *Corporate social responsibility across Europ*, Springer Berlin Heidelberg, 335–356. <https://doi.org/10.1016/j.jcae.2021.100278>
- Matten D, Moon J (2008) "Implicit" and "explicit" CSR: A conceptual framework for a comparative understanding of corporate social responsibility. *Acad Manage Rev* 33: 404–424. <https://doi.org/10.5465/amr.2008.31193458>
- McGuinness PB, Vieito JP, Wang M (2017) The role of board gender and foreign ownership in the CSR performance of Chinese listed firms. *J Corp Financ* 42: 75–99. <https://doi.org/10.1016/j.jcorpfin.2016.11.001>
- Mumu JR, Saona P, Haque MS, et al. (2022) Gender diversity in corporate governance: A bibliometric analysis and research agenda. *Gend Manag Int J* 37: 328–343. <https://doi.org/10.1108/GM-02-2021-0029>
- Nadeem M (2020) Does board gender diversity influence voluntary disclosure of intellectual capital in initial public offering prospectuses? Evidence from China. *Corp Gov* 28: 100–118. <https://doi.org/10.1111/corg.12304>

- Nadeem M (2021) Corporate governance and supplemental environmental projects: A restorative justice approach. *J Bus Ethics* 173: 261–280. <https://doi.org/10.1007/s10551-020-04561-x>
- Nadeem M, Bahadar S, Gull AA, et al. (2020) Are women eco-friendly? Board gender diversity and environmental innovation. *Bus Strateg Environ* 29: 3146–3161. <https://doi.org/10.1002/bse.2563>
- Nardella G, Brammer S, Surdu I (2020) Shame on who? The effects of corporate irresponsibility and social performance on organizational reputation. *Brit J Manage* 31: 5–23. <https://doi.org/10.1111/1467-8551.12365>
- Nguyen T, Locke S, Reddy K (2015) Does boardroom gender diversity matter? Evidence from a transitional economy. *Int Rev Econ Financ* 37: 184–202. <https://doi.org/10.1016/j.iref.2014.11.022>
- Nirino N, Santoro G, Miglietta N, et al. (2021) Corporate controversies and company's financial performance: Exploring the moderating role of ESG practices. *Technol Forecast Soc Change* 162: 120341. <https://doi.org/10.1016/j.techfore.2020.120341>
- Oh WY, Cha J, Chang YK (2017) Does ownership structure matter? The effects of insider and institutional ownership on corporate social responsibility. *J Bus Ethics* 146: 111–124. <https://doi.org/10.1007/s10551-015-2914-8>
- Ongsakul V, Jaroenjitrkam A, Treepongkaruna S, et al. (2021). Does board gender diversity reduce 'CEO luck'? *Account Financ* 62: 243–260. <https://doi.org/10.1111/acfi.12788>
- Orazalin N, Baydauletov M (2020) Corporate social responsibility strategy and corporate environmental and social performance: The moderating role of board gender diversity. *Corp Soc Responsib Environ Manag* 27: 1664–1676. <https://doi.org/10.1002/csr.1915>
- Oyewo B (2023) Corporate governance and carbon emissions performance: International evidence on curvilinear relationships. *J Environ Manage* 334: 117474. <https://doi.org/10.1016/j.jenvman.2023.117474>
- Pearce CL, Manz CC (2011) Leadership centrality and corporate social ir-responsibility (CSIR): The potential ameliorating effects of self and shared leadership on CSIR. *J Bus Ethics* 102: 563–579. <https://doi.org/10.1007/s10551-011-0828-7>
- Perryman AA, Fernando GD, Tripathy A (2016) Do gender differences persist? An examination of gender diversity on firm performance, risk, and executive compensation. *J Bus Res* 69: 579–586. <https://doi.org/10.1016/j.jbusres.2015.05.013>
- Pfeffer J, Salancik GR (1978) The external control of organizations: A resource dependence perspective. New York: Harper & Row.
- Post C, Rahman N, Rubow E (2011) Green governance: Boards of directors' composition and environmental corporate social responsibility. *Bus Soc* 50: 189–223. <https://doi.org/10.1177/0007650310394642>
- Pucheta-Martínez MC, Bel-Oms I (2019) What have we learnt about board gender diversity as a business strategy? The appointment of board subcommittees *Bus Strateg Environ* 28: 301–315. <https://doi.org/10.1002/bse.2226>
- Pucheta-Martínez MC, Chiva-Ortells C (2018) The role of directors representing institutional ownership in sustainable development through corporate social responsibility reporting. *Sustain Dev* 26: 835–846. <https://doi.org/10.1002/sd.1853>
- Raghunandan A, Rajgopal S (2022) Do ESG funds make stakeholder-friendly investments? *Rev Account Stud* 27: 822–863. <https://doi.org/10.1007/s11142-022-09693-1>

- Rao K, Tilt C (2016) Board composition and corporate social responsibility: The role of diversity, gender, strategy and decision making. *J Bus Ethics* 138: 327–347. <https://doi.org/10.1007/s10551-015-2613-5>
- Saeed A, Riaz H, Liedong TA, et al. (2022) The impact of TMT gender diversity on corporate environmental strategy in emerging economies. *J Bus Res* 141: 536–551. <https://doi.org/10.1016/j.jbusres.2021.11.057>
- Shahab Y, Hussain T, Wang P, et al. (2023) Business groups and environmental violations: Evidence from China. *Int Rev Financ Anal* 85:102459. <https://doi.org/10.1016/j.irfa.2022.102459>
- Shakil MH, Tasnia M, Mostafiz MI (2021) Board gender diversity and environmental, social and governance performance of US banks: Moderating role of environmental, social and corporate governance controversies. *Int J Bank Mark* 39: 661–677. <https://doi.org/10.1108/IJBM-04-2020-0210>
- Shiu YM, Yang SL (2017) Does engagement in corporate social responsibility provide strategic insurance-like effects? *Strateg Manage J* 38:455–470. <https://doi.org/10.1002/smj.2494>
- Spencer Stuart (2022) 2022 Spencer Stuart Board Index: Board Trends and Practices of Leading European Companies. Spencer Stuart.
- Strike VM, Gao J, Bansal P (2006) Being good while being bad: Social responsibility and the international diversification of US firms. *J Int Bus Stud* 37: 850–862. <https://doi.org/10.1057/palgrave.jibs.8400226>
- Studenmund AH (1997) *Using Econometrics. A Practical Guide*. Addison-Wesley, New York.
- Suchman MC (1995) Managing legitimacy: Strategic and institutional approaches. *Acad Manage Rev* 20: 571–610. <https://doi.org/10.5465/amr.1995.9508080331>
- Sun Y, Zhang J, Han J, et al. (2023) The impact of top management teams' faultlines on organizational transparency—Evidence from CSR initiatives. *Bus Ethics Environ Responsib* 32: 1262–1276. <https://doi.org/10.1111/beer.12564>
- Surroca J, Tribó JA, Zahra SA (2013) Stakeholder pressure on MNEs and the transfer of socially irresponsible practices to subsidiaries. *Acad Manage J* 56: 549–572. <https://doi.org/10.5465/amj.2010.0962>
- Tang Y, Qian C, Chen, G, et al. (2015). How CEO hubris affects corporate social (ir) responsibility. *Strateg Manage J* 36: 1338–1357. <https://doi.org/10.1002/smj.2286>
- Taylor RL (2005) *The Illustrated Encyclopedia of Confucianism (Vol. 2)*. Rosen Publishing.
- Terjesen S, Sealy R, Singh V (2009) Women directors on corporate boards: A review and research agenda. *Corp Gov* 17: 320–337. <https://doi.org/10.1111/j.1467-8683.2009.00742.x>
- Thatcher SM, Jehn KA, Zanutto E (2003) Cracks in diversity research: The effects of diversity faultlines on conflict and performance. *Group Decis Negot* 12: 217–241. <https://doi.org/10.1023/A:1023325406946>
- Usman M, Farooq MU, Zhang J, et al. (2019) Female directors and the cost of debt: does gender diversity in the boardroom matter to lenders? *Manag Audit J* 34: 374–392. <https://doi.org/10.1108/MAJ-04-2018-1863>
- Vandebeek A, Voordeckers W, Huybrechts J, et al. (2021) Corporate performance and CEO dismissal: The role of social category faultlines. *Corp Govern Int Rev* 29: 436–460. <https://doi.org/10.1111/corg.12376>
- Wang J, Yuan W, Rogers C (2020) Economic development incentives: What can we learn from policy regime changes? *Econ Dev Q* 34: 116–125. <https://doi.org/10.1177/0891242420909899>

- Wang Y, Wilson C, Li Y (2021) Gender attitudes and the effect of board gender diversity on corporate environmental responsibility. *Emerg Mark Rev* 47: 100744. <https://doi.org/10.1016/j.ememar.2020.100744>
- Wei KJ, Zhang Y (2008) Ownership structure, cash flow, and capital investment: Evidence from East Asian economies before the financial crisis. *J Corp Finance* 14: 118–132. <https://doi.org/10.1016/j.jcorpfin.2008.02.002>
- Wu B, Jin C, Monfort A, et al. (2021) Generous charity to preserve green image? Exploring linkage between strategic donations and environmental misconduct. *J Bus Res* 131: 839–850. <https://doi.org/10.1016/j.jbusres.2020.10.040>
- Wu Q, Furuoka F, Lau SC (2022) Corporate social responsibility and board gender diversity: A meta-analysis. *Manag Res Rev* 45: 956–983. <https://doi.org/10.1108/MRR-03-2021-0236>
- Xia J, Jiang Y, Wang H, et al. (2023) Rule violation and time-to-enforcement in weak institutional environments: A good faith perspective. *J Manag* 49: 2549–2594. <https://doi.org/10.1177/01492063221108931>
- Yang H, Xue K (2023) Board diversity and the marginal value of corporate cash holdings. *Pac Basin Financ J* 79: 102048. <https://doi.org/10.1016/j.pacfin.2023.102048>
- Yao C, Duan Z, Baruch Y (2020) Time, space, Confucianism and careers: A contextualized review of career research in China. *Int J Manag Rev* 22: 222–248. <https://doi.org/10.1111/ijmr.12223>
- Yasser QR, Al Mamun A, Ahmed I (2017) Corporate social responsibility and gender diversity: Insights from Asia Pacific. *Corp Soc Resp Env Manag* 24: 210–221. <https://doi.org/10.1002/csr.1400>
- Young MN, Peng MW, Ahlstrom D, et al. (2008) Corporate governance in emerging economies: A review of the principal–principal perspective. *J Manage Stud* 45: 196–220. <https://doi.org/10.1111/j.1467-6486.2007.00752.x>
- Yu EPY, Van Luu B, Chen CH (2020) Greenwashing in environmental, social and governance disclosures. *Res Int Bus Finance* 52: 101192. <https://doi.org/10.1016/j.ribaf.2020.101192>
- Zahid RA, Maqsood US, Irshad S, et al. (2025) The role of women on board in combatting greenwashing: A new perspective on environmental performance. *Bus Ethics Environ Responsib* 34: 121–136. <https://doi.org/10.1111/beer.12607>
- Zalata AM, Ntim CG, Choudhry T, et al. (2019) Female directors and managerial opportunism: Monitoring versus advisory female directors. *Leadersh Q* 30: 101309. <https://doi.org/10.1016/j.leaqua.2019.101309>
- Zhu N, Osei A, Agyemang AO (2024) Do board attributes influence environmental sustainability disclosure in manufacturing firms? Evidence from sub-Saharan Africa. *Corp Soc Responsib Environ Manag* 31: 4759–4771. <https://doi.org/10.1002/csr.2822>
- Zou HL, Zeng RC, Zeng SX, et al. (2015) How do environmental violation events harm corporate reputation? *Bus Strat Environ* 24: 836–854. <https://doi.org/10.1002/bse.1849>
- Zubeltzu-Jaka E, Álvarez-Etxeberria I, Ortas E (2020) The effect of the size of the board of directors on corporate social performance: A meta-analytic approach. *Corp Soc Responsib Environ Manag* 27: 1361–1374. <https://doi.org/10.1002/csr.1889>

