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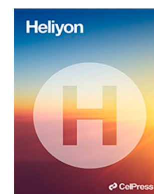

Research article

Do board characteristics impact greenwashing? Moderating role of CSR committee

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ABSTRACT

The study examines the role of board characteristics (board gender diversity, independence, and foreign-experienced directors) on greenwashing with the corporate social responsibility (CSR) committee as moderator. The study employed data for the period 2014–2023 drawn from CSMAR and infinitive database. Regression analysis was performed and the results revealed that board gender diversity, independence, and foreign-experienced directors negatively influence greenwashing among Chinese listed firms. Additionally, the CSR committee negatively moderates the board characteristics–greenwashing relationship. The study offers important implications for practitioners and regulators.

1. Introduction

Industrialization produced significant economic benefits but at the cost of pollution, which is a major concern worldwide [1]. Balancing economic development and environmental stewardship is crucial for sustainability, and this could be managed through information interaction among firms and stakeholders [2]. Issues regarding sustainability and environmental awareness exert pressure on firms to fulfill the demands of stakeholder by following appropriate environmental protocols and processes [2]. This creates opportunities for firms to receive appreciation from customers and stakeholders by providing more and factual information [3]. As this concern is related to image, reputation, and legitimacy, firms may exaggerate or disseminate fabricated information to influence the stakeholders [4].

Corporate sustainability reports and corporate social responsibility (CSR) reports, which provide non-financial information, are considered valuable sources of information [5] to promote the firm–stakeholder relationship. Research has shown that many companies exaggerate and fabricate their CSR reports to influence stakeholders [2,6] a practice known as greenwashing [7].

Greenwashing is a negative strategy applied by organizations [8] and may adversely impact firm performance [9]. Studies have reported mixed outcomes of greenwashing for firms [2,10,11] Greenwashing could be an effective tool for maintaining a favorable social image and boost relationship with stakeholders [12]. Conversely, it could lead to reputation loss, increased regulatory scrutiny, and penalties, thereby inducing long-term operational challenges [13]. These mixed results necessitate deeper research regarding the potential drivers of greenwashing. A few studies have explored the drivers of greenwashing [14–16]; however, most of them are from developed countries where environmental awareness is high and environmental regulations are stringent and robust [2,17]. Conversely, in developing countries, green regulations are inadequate and environmental awareness is low [2,17].

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There are many reasons for studying the case of China. First—and foremost, the widespread environment, social, and governance (ESG) issues associated with Chinese companies [18,19]. Second, a large number of ESG incidents (19,770) in China over the last decade [20]. Third, the widespread criticism of the initiatives by the government of China to address environmental issues [2,21]. For example [22], documented that polluting firms that should have been shut down migrated to western provinces with lax regulations. Such conditions significantly impact organizations' ESG motivations [20,23]. Thus, it is imperative to investigate these phenomena in developing countries, especially China.

Companies distribute the financial and non-financial information to different stakeholders. In this way companies published different reports such as CSR reports, financial reports, and disclosure ESG. Green washing is negative corporate behavior to disseminate false information by aggregating CSR activities [2]. The board of directors is considered the main determinant of the quality of information shared with the stakeholders [24,25]. It is responsible for the approval and disclosure of information in the annual statements [26–28]. Furthermore, the corporate board manages and monitors the operational risks of the firm. Therefore, it is responsible for ensuring that that firm maximizes the wealth of the shareholders, while adhering to the applicable laws and performing its social responsibilities [29]. Many studies have highlighted the role of the board in ESG disclosure [30–33]. However, few studies have discussed the role of board gender diversity on greenwashing—greenwashing is the difference between ESG disclosure and ESG performance. Zahid et al. [10] examined board gender diversity and greenwashing, and concluded that the presence of females on the board limited greenwashing [11] (Barontini et al., 2023). Nonetheless, to the best of our knowledge, no study has yet explored the moderating role of the CSR committee. Torelli et al. [34] stated that board executives can control false environmental disclosure. Therefore, this study examines the role of board gender diversity in greenwashing in the presence of the CSR committee. The current study is unique in several ways. First, it considered the role of gender diversity, board independence, and foreign experience toward greenwashing in the Chinese context. Second, it explored the indirect (moderating) role of the CSR committee, which handles the company's CSR matters.

De Freitas et al. [17] highlighted the difference in the levels of environmental awareness in developing and developed countries. Additionally, they stated that in developed countries, although environmental awareness is high, yet greenwashing regulations are few and lax. For example, greenwashing regulations in the USA are limited in severity and scope [17,35]. This makes the issue of greenwashing more severe in developing countries. China has received immense global criticism over environmental issues, and therefore, the government of China has adopted significant measures to improve its reputation. For example, since 2008, CSR disclosure is mandatory for Chinese firms [36]. Such institutional and stakeholder pressure may induce greenwashing.

The government of China's regulations ensured a considerable increase in ESG reporting among Chinese listed firms. According to Ref. [2], more than 30 % of Shanghai listed firms disclose their sustainability reports, which suggests the key role played by the firms' internal governance. Despite the role of the board of directors in CSR reporting, internal committees significantly impact the quality and disclosure of information [37]. Rodrigue et al. [38] highlighted the significance of CSR committees in CSR reporting, rejecting the symbolic view of CSR committees as suggested by Refs. [39–41]. The CSR committee is extremely significant for establishing stakeholder relationships and promotes the sustainability management system and procedures to authenticate and improve CSR disclosure [42,43]. The committee ensures stakeholders' interests in the corporate strategy [44]

This study explores the monitoring roles of the board of directors and the CSR committee on the greenwashing behavior of Chinese companies. The board exercises significant influence on the corporate strategy and the internal corporate governance mechanism [18]. On the one hand, to improve firm profitability, it supports greenwashing [2,45]. On the other hand, from the perspectives of ethics and morality, it discourages greenwashing behavior [46]. The CSR committee is responsible for improving the CSR performance of companies and ensuring transparency in information disclosure. Despite the growing literature on greenwashing, the role of the board's characteristics and the moderating role of CSR have been scarcely investigated.

Owing to conflicting economic and environmental logic between the government and firms, China is a good example to study. The country has experienced tremendous economic growth since 1978 after the opening up of the economy. It is an emerging economy and ranked as the second largest economy worldwide [47]. Conversely, it is also the most polluting country worldwide. In this context, the government of China launched several reforms and plans—notably, the "harmonious society," a five-year plan—during the Central Committee of the Chinese Communist Party (CPC) in 2006. Consequently, China transformed its growth model by balancing economic goals with sustainability [47]. This strategic transformation attracted significant public attention toward environmental issues, exerting pressure on firms regarding their environmental responsibility. Thus, companies began assuming social responsibilities [48]. A few companies even claimed exceeding government's requirements [49]. Additionally, CSR disclosure significantly improved.

However, media exposed these claims, revealing the greenwashing behavior of 151 Chinese firms [13]. Since 2014, Chinese local companies have grown at a rapid pace, with most of them claiming—but failing to deliver—green products [47,50]. The Chinese stock market reacted negatively to reports of greenwashing. To address this issue, the government of China enacted a law. Article 28 of the "People's Republic of China Advertising Law" states that firms disseminating false information are liable to pay two to three times the advertising cost [50]. However, few companies have been penalized for greenwashing in China [47] because of an inefficient judicial system and lax environmental regulations [47,51]. There are no green guides in China, as in the UK or Canada, which specify standards for communicating corporate environmental information. This hinders the identification of greenwashing instances in the Chinese context.

The study explores the following research question: What is the role of corporate governance in the context of greenwashing behavior among Chinese firms? Accordingly, the study aims to ascertain how gender diversity in the board influences companies' greenwashing behavior. Additionally, it explores whether board members' independence and foreign experience matters in the context of greenwashing by Chinese firms. Finally, the study intends to investigate the role of the CSR committee in the gender diversity–-greenwashing relationship.

This study makes several contributions to greenwashing research. First, it augments the knowledge of the under-explored drivers of greenwashing [52]—for example, how corporate reforms regarding the inclusion of females in corporate boards improve firms' environmental performance by limiting greenwashing. Although Chinese regulators have introduced significant governance reforms, they remain ineffective in comparison to those applied in developed countries [53]. Our study highlights the necessity of promoting female membership in the board of directors and ensuring greater independence of the board and inclusion of members with foreign experience as corporate governance tools to curtail ESG incidents. Second, our study underscores the importance of the CSR committee in mitigating greenwashing by rejecting the argument that these committees are symbolic [54]. The existence of CSR committees among 78 % of the Chinese top-100 companies is a positive indicator [55]. Our findings could motivate other companies to appoint CSR committees to improve their environmental performance and reduce greenwashing. Finally, it enriches the empirical evidence on board characteristics and greenwashing [56] with the indirect role of the CSR committee. Theoretically, the study supports the stakeholder's theory view. It is expected that a diverse board with diverse skills would ensure better internal control, leading to fewer CSR issues and transparency in environmental information dissemination. Furthermore, the study suggests that agency issues between principal and agents could be mitigated by establishing a CSR committee.

The remained of this article is organized as follows. Sector 2 presents the literature review, theoretical framework, and hypothesis development. Section 3 discusses the research method, econometric model, and data sources. Results are presented in Section 4 and Section 5 discusses the conclusions, limitations, and future research directions.

2. Literature review

Many studies have investigated the role of corporate governance in firm performance [57–59]. Numerous studies have revealed the role of the board in improving the overall performance of firms [60–62], highlighting the positive and significant impact of board gender diversity. Mohsni et al. [63] examined the role of board gender diversity and risk-taking behavior in 27 developing countries, concluding that board gender diversity negatively related to financial and operational risk while positively related to firm performance. This implies that board gender diversity limits firms' risks and improves their financial performance.

Furthermore, studies have examined the role of board gender diversity on environmental performance, internationalization, and innovation [64–71]. Ren and Zeng [64] studied the role of board gender diversity in Chinese companies' pace of internationalization. They concluded a negative relationship between gender diversity and organization's internationalization speed, but suggested that firms with more foreign-experienced females have greater pace of internationalization. Kyaw et al. [67] highlighted the strategic role of the board of directors and indicated that the presence of females in the board significantly reduces the carbon emission and improves the environmental performance of firms. Similarly, Griffin et al. [71] examined the role of board gender diversity and green innovation in the international context. They considered 45 countries and concluded that gender-diverse board companies have more patents and greater innovation efficiency.

Recently, climate change events have induced governments, organizations, regulatory bodies, and individuals to take appropriate and collective action [67]. During the recent United Nations (UN) climate change conference, many countries made collective commitments to take necessary actions and demand more from organizations to improve the environment. Thus, the stakeholders of firms are becoming sensitive toward firms' environmental performance, expecting more from them. To appear to fulfill their demands, companies are engaging in greenwashing, which is serious issue [72,73]. Santos et al. [72] conducted a systematic literature review on greenwashing research, revealing that studies from the USA ranked 1 and from the UK ranked 2. In this meta-analysis, they attempted to explore this issue from multiple perspectives and from the top-management viewpoint. Therefore, this study endeavors to explore the roles of board gender diversity, independence, and foreign experience on greenwashing in the context of the CSR. The study hypotheses are presented below.

3. Theoretical background

The corporate governance–greenwashing relationship could be explained based on the legitimacy theory, stakeholder theory, agency theory, and even, signalling theory. The selection of the most appropriate theory is always crucial. Zharfpeykan [74] stated that legitimacy is a contract that requires companies to comply with formal as well as informal social values. Roberts [75] discussed that legitimacy is a survival tool. Companies follow all compulsory rules and may not follow the voluntary ones. As ESG disclosure is voluntary in many countries, it is not well-aligned with the current study. The study applied the stakeholder theory as it refers to stakeholders' engagement [76] as "the ability to establish trust-based collaborative relationships with a wide variety of stakeholders" (p. 735). This theory states that stakeholders' engagement serves two purposes: it fulfills the ethical requirements of social norms and imparts legitimacy; and it creates reputational capital for firms by meeting the demands of disclosure from different stakeholders, thereby reducing information asymmetry, which is the objective of the signalling theory. Based on these benefits, the study considers the stakeholder theory as appropriate for explaining the relationship between board gender diversity and greenwashing. Corporate environmental performance fits well with both legitimacy and the stakeholder view. This is because societal expectations regarding environmental performance have increased over time and different stakeholders expect more from firms regarding environmental issues. To overcome this pressure, firms may engage in greenwashing.

The stakeholder theory argues that the business strategy should consider the interests of all stakeholders [77]. Companies always attempt to balance the interests of different stakeholders. Firms' engagement in CSR activities requires a balance between profitability and social responsibilities [2]. CSR reporting is considered an appropriate tool to manage stakeholders [78]. Another stream of research states that CSR may be detrimental to stakeholders' interest—however, this view has not yet been substantiated. Over the past

two decades, significant research has been conducted on CSR from multiple perspectives, including corporate governance [79–81], firm performance [82], and debt financing [83]. A few highlighted large firms are only talking about CSR and have no influence on the firm performance [84].

There exists a growing body of literature on the relationship between board governance and quality of CSR information [85,86]. The board of directors has a significant role in adopting the best management practices to satisfy the internal stakeholders as well as to meet the CSR requirements of external stakeholders [87,88]. These management practices are drivers of greenwashing [89,90]. The stakeholder theory explains that success in business is dependent on different stakeholders, including customers, governments, society, media, etc. CSR is the mechanism via which firms maintain a relationship of trust with stakeholders [91,92]. This theory plays a key role in explaining the greenwashing behavior of companies. Firms used to greenwash a tool to induce stakeholders through less cost deception. Companies misuse this channel by sharing fabricated environmental information to maintain stakeholders' trust and expectations [93]. There are many reasons companies engage in greenwashing: for a better social image, to obtain financing (Zhang, 2022), and to maximize the firm value [2]. The CSR committee plays a significant role in meeting the demands of different stakeholders.

The upper echelon theory explains the role of diverse directors in the greenwashing behavior of firms. It states that the top-level management makes decisions based on its values and experiences [94]. A heterogeneous board positively affects CSR practices and firm value [95]. Females' presence in the board promotes more ethical decision-making [96,97] and more environment friendly decisions [98,99]. This theory is widely applied in CSR-related studies and greenwashing studies [2]. Numerous studies have explored the consequences of greenwashing [100], but research is scarce on governance and greenwashing in the context of the CSR committee. Therefore, this study tests this framework (see Fig. 1) to identify the role of board directors, the CSR committee, and greenwashing among Chinese firms.

4. Hypothesis development

A strand of research has highlighted the significance of board members and executives in implementing and monitoring measures to curb environmental misinformation [2,101]. Females' presence in the board is significant in minimizing false environmental claims [102]. Zahid et al. [10] studied the role of board gender diversity and greenwashing and reported their negative mutual relationship. Eliwa et al. [103] examined the role of board gender diversity in ESG decoupling. Based on an international sample of 26,176 firms across 29 countries, they concluded that firms with more female directors tend to engage less in ESG decoupling [104]. In the context of the above arguments, we hypothesize that.

H1. Females in the board negatively influence greenwashing

Within the corporate governance framework, the role of independent directors has received significant attention from different perspectives, including firm performance [105–107] and CSR [108,109]. Studies on corporate governance have highlighted the independent director's positive role in firms' environmental performance [110].

Post et al. [110] documented that firms with a greater number of independent directors are more likely to perform their environment responsibilities better and promote greater environmental sustainability. Barontini et al. [11] suggested that the board's independence has a positive impact on curbing greenwashing. Similarly, Erol and Cankaya [111] concluded that the board's independence has a significant and negative impact on greenwashing. Thus, we hypothesize the following.

H2. Board independence negatively influences greenwashing

A few studies have underscored the role of poor governance in developing countries [112,113]. Empirical evidence suggests that

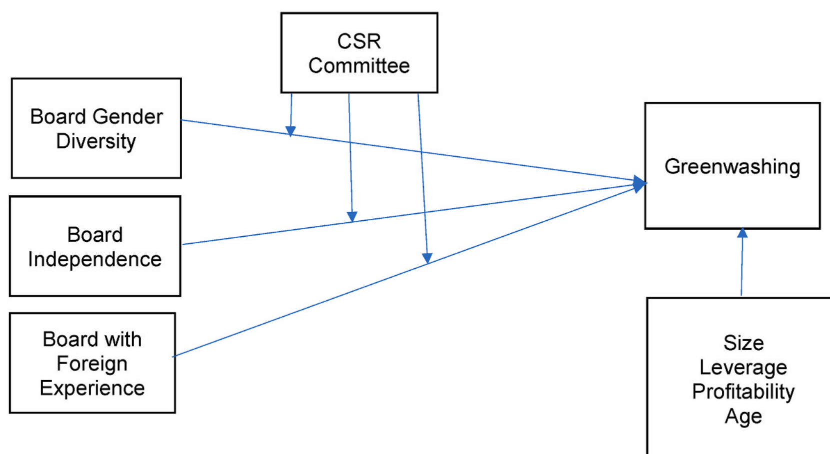

Fig. 1. Proposed model.

firms with foreign-experienced board members follow international standards and have better corporate governance [112], which discourages firms' greenwashing behavior. Toumi et al. [113] examined the role of foreign-experienced directors in CSR performance among French companies and concluded that directors with foreign experience improve the ESG disclosure quality. Matten and Moon [114] explained that directors who have worked in more stakeholder-oriented countries are more responsible and sensitive toward CSR. They apply their experience to improve the CSR initiatives in their home countries. Hu et al. [115] suggested that internal supervision through foreign-experienced directors, and even foreign investors, reduces greenwashing. Accordingly, we hypothesize the following.

H3. Foreign-experienced directors have a negative relationship with greenwashing

Randrianasoslo and Semenove [115] claimed that the influence of firms on CSR investment and CSR transparency could be contingent on industry level-, firm level-, and institutional level-factors. Among these, the existence of the CSR committee is crucial [87]. It is assumed that the CSR committee is the board's sub-committee and includes CSR experts who facilitate the implementation of CSR policies, ensure information reporting, and monitor the proposed measures [116,117]. Peters and Romi [118] highlighted the role of the CSR committee, claiming that it ensures that corporate objectives are aligned with stakeholders' expectations and firms' sustainability risk measures are appropriately managed. Therefore, the existence of the CSR committee significantly impacts greenwashing.

Hart [119] suggested that firms should adopt a proactive approach to build sustainable capabilities by following more rules and regulations. Additionally, companies should have CSR committees to improve their CSR performance. Many studies have highlighted the link between CSR and firms' environmental performance [39,40,120]. Elmaghrabi [39] examined the role of the CSR committee in UK companies and concluded that it significantly enhances firms' CSR performance. The results also confirmed that companies with CSR committees have fewer CSR controversies as compared to their counterparts. According to Shaukat et al. [121], establishment of CSR committees suggests firms' seriousness toward CSR issues.

Spitzeck [122] explored governance structures and corporate responsibility and suggested that CSR committees improve environmental performance. Empirical evidence suggests that CSR committees positively moderate the corporate governance–firm performance relationship [123,124]. Chouaibi et al. [125] examined the role of good governance and integrated quality reporting among European companies. Studies have highlighted the moderating role of the CSR committee in assuring CSR reporting [126]. Gerged et al. [122] examined the moderating role of the CSR committee on CSR investment and CSR transparency across 61 countries. They employed the random effects regression analysis and reported that the CSR committee positively moderates the relationship between firms' CSR investment and CSR transparency. Bifulco et al. [124] examined the moderating role of the CSR committee on ESG score and market value, revealing that the CSR committee has a significant positive moderating effect on ESG score and market value in the STOXX Europe 600 companies. Additionally, their results showed that the CSR committee positively moderates the relationship between gender diversity and greenwashing. Thus, the following are hypothesized.

H4. The CSR committee negatively moderates the relationship between gender diversity and greenwashing

H5. The CSR committee moderates the relationship between board independence and greenwashing

H6. The CSR committee negative moderates the relationship between foreign-experienced board and greenwashing

5. Research methods

To achieve the study objective, we examined Chinese manufacturing companies A-shares listed on the Shanghai market. We excluded financial sector companies owing to their different reporting standards. There were several reasons why the study considered manufacturing companies. The manufacturing industry is among the leading industries of China, and makes a direct and significant contribution to the country's gross domestic product (GDP) [127]. Recently, Chinese manufacturing has been in spotlight because of serious issues such as tax fraud, environmental issues, corruption, and health and safety issues [127,128]. Furthermore, Chinese manufacturing companies are considered extremely polluting, drawing immense criticism from stakeholders [47129-130]. Thus, the manufacturing industry has greater responsibility to disclose accurate ESG information than other industries [127]. We excluded three companies that did not have a director with foreign experience throughout the sample time frame (2014–2023). Additionally, we excluded companies with missing data. Finally, the study considered 587 firms and 5283 observations. Corporate governance data are drawn from China's stock market and accounting research (CSMAR) database widely acknowledged in the existing literature on corporate governance [129–131]. Greenwashing data were drawn from Bloomberg and Asset 4 ESG [113]. For the generalized method of moments GMM, we applied the independent variables lags as the instrument. The study employed the following econometric models to test the first three hypotheses:

$$GW_{it} = \alpha + \beta_1 GD_{it} + \beta_2 CSR_{it+} \beta_3 S_{it} + \beta_4 L_{it} + \beta_5 P_{it} + \beta_6 A_{it} + \epsilon \ldots \quad \text{Model 1}$$

$$GW_{it} = \alpha + \beta_1 BI_{it} + \beta_2 CSR_{it+} \beta_3 S_{it} + \beta_4 L_{it} + \beta_5 P_{it} + \beta_6 A_{it} + \epsilon \ldots \quad \text{Model 2}$$

$$GW_{it} = \alpha + \beta_1 DFE_{it} + \beta_2 CSR_{it+} \beta_3 S_{it} + \beta_4 L_{it} + \beta_5 P_{it} + \beta_6 A_{it} + \epsilon \ldots \quad \text{Model 3}$$

Where GW stands for gender diversity, GD stands for gender diversity, BI stands for board independence, FE stands for directors with foreign experience, CSR stands for CSR committee, S stands for size, L stands for leverage, P stands for profitability, and A stands for the age. i and t imply i firm and year t, respectively. To test hypotheses 4–6, we employed the following moderation models:

$GW_{it} = \alpha + \beta_1 GD_{it} + \beta_2 CSR_{it+} \beta_3 GD^*CSR_{it} + \beta_4 S_{it} + \beta_5 L_{it} + \beta_6 P_{it} + \beta_7 A_{it} + \epsilon$ … … … … … …. Model 4

$GW_{it} = \alpha + \beta_1 BI_{it} + \beta_2 CSR_{it+} \beta_3 BI^*CSR_{it} + \beta_4 S_{it} + \beta_5 L_{it} + \beta_6 P_{it} + \beta_7 A_{it} + \epsilon$ … … … … … … …. Model 5

$GW_{it} = \alpha + \beta_1 EFD_{it} + \beta_2 CSR_{it+} \beta_3 FED^*CSR_{it} + \beta_4 S_{it} + \beta_5 L_{it} + \beta_6 P_{it} + \beta_7 A_{it} + \epsilon$ … … … … …. Model 6

6. Description and measurement of variables

The study used gender diversity as the first independent variable, measured as the total number of females to total board size. This is a valid measure for diversity and widely used in the literature [132,133]. Board independence was the second independent variable, measured as the percentage of independent directors in the board [128,134–136]. Foreign experience was the third independent variable, measured as the directors with foreign experience [112,136–138]. Greenwashing was the dependent variable, measured as the difference between ESG disclosure and ESG performance [13,22,139]. ESG disclosure implies the ESG score published by the company on Bloomberg and Asset 4 ESG performance published on Asset4. There is a list of control variables that are added to the model based on their importance, and may influence greenwashing behavior and matters for disclosure. These include firm size, leverage, profitability, and firms age [140,141]. Studies have suggested that these variables may create the influence to the reporting the ESG disclosure as slack of resources initiate the voluntary and additional disclosure and should be controlled [142,143].

7. Results and discussion

Table 1 presents the descriptive statistics of the studied variables. Gender diversity average is 16.2 %, with a maximum of 30 %. Thus, despite efforts by the government, gender diversity remains low. Board independence average is at 30 % with standard deviation of 0.0321. It is 80 % at the maximum level, suggesting a satisfactory level of independence. Foreign-experienced directors at Chinese boards, on average, account for 1.2 %, with the upper limit of 36 %. Thus, the majority of the directors on Chinese boards have local experience, which is good to operate at the national level but may not be adequate for international operations. Greenwashing in Chinese companies stood at 0.03 %, with a standard deviation of 1.29. The maximum level was 3.063 %, which suggests a significant disparity among Chinese companies. Regarding the CSR committee, the average value of 0.457 % suggests satisfaction with these committees among Chinese firms. Among the control variables, all the firms enjoyed good profitability, which is 0.41 % on average.

Table 2 presents the correlation results. No multicollinearity was observed as coefficients among the studied variables, as evidenced by the low coefficients shown above [144]. Correlation among board gender diversity and greenwashing was −0.27, which shows an inverse relationship. Similarly, board independence and existence of the CSR committee showed negative relationships with greenwashing, confirming the stakeholder's view.

Regression results are reported in Table 3. Direct relationships between gender diversity, board independence, and directors' foreign experience are examined to test H1–H3. Regression (random or fixed) is employed to test the hypotheses; fixed or random is selected via the Hausman test. The significance values in the Hausman test for board gender diversity (0.024), board independence (0.014), and foreign-experienced directors (0.012) favor fixed effects.

Starting from Model 1, the coefficient of gender diversity (−0.015***) showed that board gender diversity negatively influences greenwashing. The results are in line with those derived by Zahid et al. [10], that the presence of females on the corporate board limits greenwashing. This suggests that females are more ethical and attempt to protect the interests of all stakeholders. The findings support the corporate governance reforms regarding the inclusion of the females on the board to improve the environmental performance and information disclosure. Wang et al. [145] highlighted Chinese regulators' challenges regarding frauds in Chinese companies, proposing inclusion of females on the board to reduce frauds. This aligns with our findings that female presence reduces financial and information frauds.

Model 2 tested H2. The overall model value showed that the model was significant (0.000) at the 1 % significance level. The Hausman value supported the fixed effects and the coefficient of board independence (−0.04***) showed that a more independent board was negatively associated with greenwashing. As independent directors do not have a direct interest in the company, their

Table 1
Descriptive statistics.

Variables	Mean	Std.	Min.	Max.
GD	0.162	0.142	0	0.3
BI	0.321	0.0321	0.081	0.802
DFE	0.012	0.0531	0	0.362
GW	0.003	1.293	−2.572	3.063
CSR	0.457	0.672	0	1
Size	2.673	0.362	1.064	3.273
Leverage	0.371	0.381	0.007	2.04
Profitability	0.41	0.042	−0.037	0.19
Age	2.378	0.391	1.073	3.139

Table 2
Correlation matrix.

	VIF	GD	BI	DFE	GW	CSR	Size	leverage	ROA	Age
GD	1.06	1								
BI	1.66	0.12	1							
DFE	1.32	0.15	0.10	1						
GW	–	−0.27	−0.38	−0.16	1					
CSR	1.89	0.08	0.34	0.29	−0.19	1				
Size	1.54	0.36	0.18	0.08	0.32	0.18	1			
Leverage	1.43	−0.37	0.56	−0.17	−0.13	0.02	−0.26	1		
Profitability	1.24	0.41	0.34	0.26	−0.19	0.37	0.34	−0.10	1	
Age	1.76	0.23	0.18	0.11	−0.07	0.13	0.43	0.21	0.38	1

Table 3
Regression results.

	Model 1		Model 2		Model 3	
	Fixed Effects	GMM	Fixed Effects	GMM	Fixed Effects	GMM
Model Sign.		0.000		0.000		0.000
Constant	0.024**	0.503**	0.017**	0.361**	0.019*	0.441**
GD	−0.015***	−0.033***				
BI			−0.04***	−0.014***		
DEF					−0.007***	−0.005***
CSR	−0.012**	−0.042**	−0.038*	−0.021*	−0.007***	−0.022**
Size	0.005***	0.035**	0.061***	0.026**	0.011*	0.029*
Leverage	−0.023***	−0.038**	−0.022**	−0.061**	−0.031**	−0.055**
Profitability	−0.05***	−0.038***	−0.10	−0.087**	−0.11**	−0.42**
Age	−0.02**	−0.25***	−0.05**	−0.093**	−0.10***	−0.0245***
Hausman	0.024		0.0143		0.012	
M2		0.314		0.336		0.219
AR(2)		0.313		0.331		0.312
Sargan Test		0.216		0.226		0.265
Wald test						
N	5283		5283		5283	

***1 %, **5 %, *1 % level of significance. GD= gender diversity; BI= board independence EF= directors with foreign experience; CSR= Corporate social responsibility Committee.

Table 4
CSR Committee as Moderator regression results.

	Model 1		Model 2		Model 3	
	Fixed effects	GMM	Fixed Effects	GMM	Fixed Effects	GMM
Model Sig.		0.000		0.000		0.000
Constant	0.0216*	0.019**	0.022*	0.431*	0.015*	0.531**
GD	−0.004*	−0.020*				
CSR	−0.002**	−0.004**				
GD*CSR	−0.006***	−0.03***1				
BI			−0.04**	−0.03**		
CSR			−0.022**	−0.041*		
BI*CSR			−0.01**	−0.051***		
DFE					−0.008**	−0.082**
CSR					−0.014***	−0.0106**
DFE*CSR					−0.003***	−0.025***
Size	0.032	0.015*	0.015*	0.082**	0.065*	0.097**
Leverage	−0.034	−0.014**	−0.025**	−0.027**	−0.055**	−0.082*
Profitability	−0.025	−0.016*	−0.008**	−0.078**	−0.006*	−0.018**
Age	−0.034	−0.015*	−0.063**	−0.097**	−0.018*	−0.545**
Hausman	0.015		0.0123		0.035	
M2		0.215		0.334		0.215
AR(2)		0.285		0.335		0.331
Sargan Test		0.178		0.231		0.202
Wald Stat						
N	5283		5283		5283	

***1 %, **5 % and *10 % level of significance. GD= gender diversity; CSR= corporate social responsibility committee; BI= board independence; DEF= directors with foreign experience.

adherence to rules and regulations is better, which discourages greenwashing. Thus, H2 is supported.

Model 3 tested H3, and both random and fixed regressions showed the same relationship, which confirms that the presence of foreign-experienced directors negatively influenced greenwashing. Our findings complement the findings of Hussain et al. [146], that directors with foreign experience have a direct and positive influence on firms' environmental performance. This is because directors with foreign experience possess greater knowledge and experience regarding non-financial disclosure. Additionally, they promote stakeholders' interests while devising the business strategy, leading to improved information transparency and reduced greenwashing.

The CSR committee coefficient showed that the existence of the CSR committee is negatively associated with greenwashing. This implies that the CSR committee plays a significant role in the CSR activities of the company and serve to balance the interests of internal and external stakeholders. Our results align with those derived by Velte and Stawinoga [54], that the CSR committee positively and significantly improves CSR outcomes. All control variables, except firm size, suggested a negative relationship with greenwashing, implying that greenwashing is more prevalent in bigger firms. This supports the findings of [147] who identified a U-shaped relationship between CSR and firm size. However, our findings contradict those of D'Amato and Falivena [148], who stated that smaller and medium-level firms are ineffective in CSR activities owing to lack of financial resources. CSR moderating results are presented in Table 4.

Model 1 results reveal the moderating role of the CSR committee between board gender diversity and greenwashing. The Hausman test suggested using the fixed effect results and the coefficient of CSR moderation (−0.021***) showed that the CSR committee played its due role and negatively affected greenwashing. The study contradicts Bifulco et al. [124] (2023) findings where they empirically reported no significant role of the CSR committee in the ESG performance of firms. To overcome heterogeneity, autocorrelation, and heteroscedasticity, the study employed the widely applied generalized approach [149].

Model 2 tested the moderating role of CSR on board independence and greenwashing. By following the Hausman test significance, the study considered the fixed effect regression. The coefficient of BI*CSR (0.017***) showed that the existence of the CSR committee significantly negatively moderates the relationship between board independence and greenwashing. The results imply that the CSR committee is not merely symbolic, but plays its due role in CSR-related activities and safeguards the interests of all stakeholders. The results support the findings of Yu et al. [101] who confirmed that independent directors play a significant role in curbing greenwashing.

Model 3 examined the CSR committee's moderating role on DFE and greenwashing. The interaction results revealed that the CSR committee negatively moderates the relationship between directors with foreign experience and greenwashing. The results confirm Zhang et al. [137] findings that directors with foreign experience are positively engaged in CSR activities. Furthermore, they explained that directors with extended foreign experience—educational or professional—significantly improve firms' CSR activities. Additionally, the role of CSR further promotes this relationship by providing more specific CSR information and discouraging greenwashing. Regarding robustness, the GMM results remained consistent and provided the same results. The interaction results of the CSR committee confirmed that the CSR committee is more likely to report and provide accurate and genuine CSR-related information. The study assumed that the CSR committee ensures the veracity of the disclosed information and considers the interests of all the stakeholders [150,151].

8. Conclusion

The study investigated the relationship between board characteristics, CSR committee, and greenwashing among Chinese listed firms. Stakeholders such as suppliers and investors intend to maximize their returns, but without aggravating the risks of environmental, social, and governance issues. The lack of standardized procedures, un-audited sustainability reports, and absence of a global governing body to monitor the sustainability reports encourage firms' greenwashing behavior—that is, fabrication of ESG disclosures. This study attempted to identify the internal corporate governance mechanism, which may help reduce greenwashing.

The results revealed that firms' greenwashing behavior may be reduced by: (i) greater participation of females on the board of directors; (ii) greater board independence; (iii) a larger number of directors with foreign experience; and (iv) the existence of CSR committees. The findings have theoretical and practical implications. First, they reveal that the internal governance mechanism of companies could be improved by increasing females' participation in the board, inviting more independent members on the board, and hiring more foreign-experienced directors. Moreover, the existence of a dedicated CSR committee plays a crucial role in controlling firms' greenwashing behavior, negating the view that CSR committees are merely symbolic.

The findings have theoretical and practical implications. From a theoretical perspective, the study supports the stakeholder's view, suggesting that firms engage in greenwashing as a response to the pressure and expectations of stakeholders [152]. Many studies have explored the drivers of greenwashing, but internal corporate governance has been largely ignored [90]. This study empirically highlighted the role of internal governance—especially, the existence of the CSR committee—in addressing greenwashing. Regarding practical implications, the study highlights the key roles of internal governance and the CSR committee in designing and implementing the ethical governance mechanism to address the issues of manipulation and fabrication of information, and concealment of facts. Additionally, rather than introducing fresh regulations, regulators must collaborate with firms to address greenwashing. Together they must devise strategies to meet the expectations of stakeholders and improve the internal governance to reduce greenwashing and obtain long-term benefits from ESG disclosure.

Despite these interesting findings, the study has a few limitations. First, this study includes only the manufacturing companies. Future studies should divide the manufacturing companies into two groups: heavily polluting firms and other firms. Additionally, future research could explore the same relationships across different industries in the Chinese context, and even across countries. Second, this study included a limited number of corporate governance variables. In the future, additional governance measures could

be explored. Finally, it would be interesting to investigate the moderating role of variables such as institutional or foreign investors.

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Data availability

All the data used in the study is publicly available on CSMAR, Refinitiv and Bloomberg.

CRediT authorship contribution statement

Yiming Ma: Writing – original draft, Methodology, Conceptualization. **Muhammad Ishfaq Ahmad:** Writing – review & editing, Methodology, Formal analysis.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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