Received: 6 February 2023 | Revised: 9 April 2023 | Accepted: 14 June 2023

DOI: 10.1002/bse.3501

RESEARCH ARTICLE

Business Strategy and the Environment

WILEY

Is it the mere female directors or their attributes that matter for the quality of corporate sustainability disclosures?

Haseeb Ur Rahman[1] | Muhammad Zahid[2,3] | Amin Jan[4,5] | Mamdouh Abdulaziz Saleh Al-Faryan[6,7] | Khaled Hussainey[6]

[1]Interdisciplinary Center for Finance and Digital Economy, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia

[2]Department of Management Sciences, City University of Science and Information Technology, Peshawar, Pakistan

[3]Postdoctoral Fellow, Faculty of Hospitality Tourism and Wellness, Universiti Malaysia Kelantan, Kota Bharu, Malaysia

[4]Faculty of Hospitality Tourism and Wellness, Universiti Malaysia Kelantan, Kota Bharu, Malaysia

[5]School of Management and Marketing, College of Business and Public Management, Wenzhou-Kean University, Wenzhou, Zhejiang, China

[6]School of Accounting, Economics and Finance, Faculty of Business and Law, University of Portsmouth, Portsmouth, UK

[7]Consultant in Economics and Finance, Riyadh, Saudi Arabia

Correspondence
Haseeb Ur Rahman, Interdisciplinary Center for Finance and Digital Economy, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia.
Email: drhaseeb@ustb.edu.pk

Abstract

This study aims to inquire whether it is the mere female directors or their certain attributes that improve the quality of corporate sustainability disclosures (QCSD). Annual and sustainability reports are used to obtain data for 300 non-financial Pakistani listed companies selected through stratified random sampling for the period 2012–2021. The study employed ordinary least squares with panel-corrected standard errors to test research hypotheses. The findings that neither support "tokenism" nor "critical mass" assumptions revealed that firms with female directors on the board, regardless of how many, have better QCSD than others. Similarly, the proportion of female directors on the board and audit committee also showed a positive association with QCSD. The positive role of independent female directors and their experience was slightly more pronounced than the executive female directors and their experience in improving QCSD. Likewise, the positive effect of female directors' business-related education was marginally higher than their non-business education in improving QCSD. Furthermore, female directors' master's or above level of education had a significant positive, while their bachelor's or below level of education had no significant association with QCSD. The study offers several theoretical and practical implications.

KEYWORDS
female directors' attributes, Pakistan, quality of corporate sustainability disclosures

1 | INTRODUCTION

In recent decades, the corporate world has faced severe scrutiny and pressure to reduce the negative effects of their operations (Issa et al., 2022; Rahman et al., 2023; Shaheen et al., 2021), safeguard stakeholders' legitimate interests, and report their efforts toward corporate sustainability (CS) (Al-Najjar & Salama, 2022; Jin et al., 2021; Rahman et al., 2023). Nevertheless, the successful adoption of CS and its reporting are still serious challenges, especially in developing countries (Gong et al., 2021; Rahman, Zahid, & Khan, 2021; Shaheen et al., 2021; Zahid et al., 2018). Some researchers asserted that boardroom gender diversity (BGD) acts as a substitute for corporate governance (CG), especially in countries with weak governance structures (Ali Gull et al., 2022; Rahman, Zahid, & Khan, 2021). Other authors

Abbreviations: AC, audit committee; ACCA, The Association of Chartered Certified Accountants; APR, Asiatic Public Relations; BGD, boardroom gender diversity; CERB, The Centre of Excellence in Responsible Business; CG, corporate governance; CPI, The Cleaner Production Institute; CS, corporate sustainability; CSR, corporate social responsibility; EKN, The Embassy of the Kingdom of the Netherlands; FE, fixed effects; GCP, Global Compact Pakistan; GRI, Global Reporting Initiative; ICAP, The Institute of Chartered Accountants of Pakistan; ICMAP, The Institute of Cost and Management Accountants of Pakistan; OLS, ordinary least squares; PCP, The Pakistan Centre for Philanthropy; PCSEs, panel-corrected standard errors; PISD, Programme for Industrial Sustainable Development; PSX, Pakistan Stock Exchange; QCSD, quality of corporate sustainability disclosures; RBI, The Responsible Business Initiative; RE, random effects; SECP, Securities and Exchange Commission of Pakistan; UNDP, The United Nations Development Programme; WWF, World Wildlife Fund.

also consider BGD to be an important internal governance mechanism for improving the quality of corporate sustainability disclosures (QCSD). Besides increasing the allocation of the required human and financial resources, BGD also pushes firms for the development as well as the implementation of effective integrating strategies that positively influence QCSD (Al-Najjar & Salama, 2022; Issa et al., 2022; Katmon et al., 2019; Rahman et al., 2023). Female directors have fewer social ties with managers; hence, they are more independent and effective in challenging firms' decisions that may have negative implications for stakeholders' interests (Galbreath, 2018; Issa et al., 2022; Zahid et al., 2019). Female directors tend to be more kind and ethical and less tolerant of firms' immoral policies and other wrongdoings, all of which positively influence QCSD (Elmagrhi et al., 2019; Katmon et al., 2019; Zahid et al., 2019). However, on the contrary, some researchers also documented that female directors have a negative or no relationship with QCSD due to their less aggressive approach or unnecessary excessive monitoring (Adams & Ferreira, 2009; Khan, 2010; Yang et al., 2019).

In addition to contextual and methodological differences (Rahman & Zahid, 2021; Wang & Clift, 2009), previous studies may also lack agreement for mostly overlooking the "tokenism" and "critical mass" assumptions of female representation on the board (Gong et al., 2021; Yang et al., 2019), and a few studies that probed their impact on CS and its reporting also produced mixed results by either supporting (Gong et al., 2021) or opposing their presence on the board (Yang et al., 2019). Furthermore, the incongruence may also be because the majority of the prior studies mostly focused on "BGD" and "women or female directors" and their experience (Al-Najjar & Salama, 2022; Gallhofer, 1998; Shaheen et al., 2021) rather than differentiating them and their experience as of "independent" and "executive" female directors, especially in regard to QCSD (Giannarakis, 2014; Issa et al., 2022). The disagreement found among previous studies could also be associated with overseeing the differences in female directors' education (both level and background) in their investigations. Limited studies that examined the role of female directors' level of education in promoting firms' environmental and sustainable performance and their reporting also produced mixed results by reporting positive (Issa et al., 2022), negative, and no relationships (Elmagrhi et al., 2019; Yang et al., 2019). Similarly, female directors holding MBA degrees were found to have no (Yang et al., 2019) and a positive relationship with QCSD (Aspen Institute, 2008). Except for a few studies with positive findings, the majority of the prior literature also scantly explored the role of female directors' membership on the audit committee (AC) in enriching QCSD (Appuhami & Tashakor, 2017; Pitenoei et al., 2022).

To sum up, the prior scarce literature investigating the predictors of CS and QCSD mostly focused on the simple proportion or critical mass representation of female directors and their experience or level of education and produced mixed results. Besides the contextual and methodological differences (Rahman & Zahid, 2021; Wang & Clift, 2009), these studies may also lack agreement due to overlooking a consolidated approach. With this in mind, this study poses the question of whether it is the mere female directors, their specific numerical representation on the board, or certain other attributes that matter for QCSD. To answer, this study adopts a holistic approach to explore the role of female directors' different numerical representations (tokenism and critical mass), position (independent and executive directors), experience (independent and executive directors), education (level and background), and AC membership in improving the QCSD of 300 non-financial Pakistani listed companies from 2012 to 2021. The study has several contributions. First, it contributes to the prior incongruent literature that mostly inquired about the role of the mere presence or the proportion of female directors rather than their different numerical representations (tokenism and critical mass) and certain other important attributes like position, experience, education, and AC membership in improving QCSD. Second, it uses a multi-theoretical framework as the hypothesized relationships and the consequent findings may not be fully explained by a single theory as suggested by Nguyen et al. (2020). Third, the study also enriches the literature, especially in the context of a developing country such as Pakistan where BGD and QCSD are still new subjects and there is a dearth of research in the area. Lastly, the study informs regulators and other key stakeholders of developing countries, especially Pakistan about the level of compliance and importance of different voluntary regulations that recommend increasing BGD, CS, and its reporting. Besides having no strong legal protection for the stakeholder, the context of Pakistan is also appropriate and important for the current inquiry as it is passing through severe economic and environmental challenges.

The paper proceeds as Section 2 discusses the context of the study. Section 3 reviews the literature and develops research hypotheses. Section 4 deals with research design while Section 5 explains the research methods and findings of the study. Finally, Section 6 reports the conclusions of the study.

2 | CS AND ITS DISCLOSURE IN PAKISTAN

The World Wildlife Fund (WWF) and the Association of Chartered Certified Accountants (ACCA) launched the "Environmental Reporting Award" in 2002, while the Institute of Chartered Accountants of Pakistan (ICAP) and the Institute of Cost and Management Accountants of Pakistan (ICMAP) jointly introduced the "Best Sustainability Report Award" in 2011 for increasing awareness, motivation, and competition among Pakistani firms for the promotion of sustainability and its reporting. Similarly, the Cleaner Production Institute (CPI), in collaboration with the Embassy of the Kingdom of the Netherlands (EKN), also introduced a "Programme for Industrial Sustainable Development (PISD)" in Pakistan in July 2007. Several other organizations such as Corporate Social Responsibility (CSR) Pakistan, Asiatic Public Relations (APR), Global Compact Pakistan, the Responsible Business Initiative (RBI), and the Pakistan Centre for Philanthropy (PCP) also work toward improving QCSD (Hasan et al., 2022; Mirza, 2017; Saigal, 2020). Besides introducing the "CSR Order" in 2009 and "CSR Voluntary Guidelines" in 2013, the Securities and Exchange Commission of Pakistan (SECP) also revised CG codes—CCG 2012, 2017, and 2019—to reinforce the adoption of CS and its reporting and to

increase BGD, among others (Rahman, Zahid, & Khan, 2021; Saigal, 2020). Besides developing and implementing integrating strategies, the corporate boards were also held responsible by CCG 2017 and 2019 to ensure firms' reporting of their compliance with the 2013 CSR guidelines. CCG 2019 also mandated the presence of at least one female director on each board of the listed companies (Mirza, 2017; Saigal, 2020). However, despite all of these endeavors, CS reporting especially by following the Global Reporting Initiative (GRI)—which is SECP's recommended framework—is still in the embryonic stages in the country (Mirza, 2017; Rahman, Zahid, & Khan, 2021).

A survey carried out by the Centre of Excellence in Responsible Business (CERB) and the United Nations Development Programme (UNDP) in 2019 disclosed that only 17% of Pakistani companies follow GRI as compared to 73% of the companies around the world. Likewise, only 50 out of 540 firms registered on the Pakistan Stock Exchange (PSX) were found to publish standalone sustainability reports (Hongming et al., 2020). The low levels and inferior quality of CS and its disclosure restrict Pakistani firms from entering the international markets (Hasan et al., 2022; Mahmood et al., 2019). Besides the severe negative effects of climate change and global warming on the environment and society, the existing economic crisis and the potential of the textile industry of Pakistan also highlight the need for attracting international investors and customers by promoting CS and its reporting. Hence, a roundtable meeting held in 2019 recommended a standard non-financial reporting mechanism based on the principle of "comply or explain" in the country (Hongming et al., 2020).

3 | LITERATURE REVIEW

3.1 | Theoretical framework

Following Nguyen et al. (2020), this study borrows the prepositions of many theories such as stakeholder, agency, upper echelon, tokenism, and critical mass theories simultaneously. According to stakeholder theory, female directors are more generous and ethical, which persuades firms to extend social and environmental welfare. Furthermore, they also help firms to increase meaningful engagements and build long-term relationships with stakeholders (Freeman, 1984, 2004; Rahman, Zahid, & Muhammad, 2022). Similarly, agency theory assumes that female directors augment the board's monitoring to protect stakeholders' interests. The theory assumes that female directors, being more independent and critical, reduce information asymmetry by improving the quality of firms' financial and non-financial information reporting (Fama & Jensen, 1983; Jensen & Meckling, 1976; Rahman & Zahid, 2021; Zahid et al., 2019). Drawing upon upper-echelon theory, female directors increase boardroom diversity and improve the quality of non-routine decisions, including those related to CS and its reporting by discouraging group thinking and contributing new perspectives (Hambrick & Mason, 1984; Rahman, Zahid, & Khan, 2021). Tokenism theory, however, assumes that firms that showcase one or two female directors to avoid public scrutiny and diffuse stakeholders' pressure receive no positive return (Carter et al., 2010; Torchia et al., 2011). The critical mass theory also assumes that female directors influence decisions and discussion in a male-dominated boardroom when they are at least three (Konrad et al., 2008; Owen & Temesvary, 2018). According to the theory, female representation below a specific threshold is easily marginalized by a higher number of male colleagues on the board (Kanter, 1979; Rahman, Zahid, & Khan, 2021). This study employs a multi-theoretical perspective by using the theoretical postulations of all of these discussed theories, wherever needed, in establishing and explaining the hypothesized relationships.

3.2 | Prior empirical studies and hypotheses development

The literature on the impact of female directors on the quality of corporate reporting is quite limited. Because, most of the prior studies examined the impact of female directors' attributes on the quality of financial reporting measured by earnings management (see, e.g., Gull et al., 2018; Zalata et al., 2022). Therefore, in this section, we limit our review to those scholarships which somehow link boardroom gender diversity with CSR, CS, or firms' social and environmental performance and their reporting.

3.2.1 | Female directors and QCSD

Stakeholder theory posits that the unique feminine attributes of female directors make them more sympathetic and sensitive than their male colleagues, especially in moral reasoning, social orientation, and responding to others' claims, all of which have positive implications for CS and its disclosure (Al-Najjar & Salama, 2022; Eagly et al., 2003; Zahid et al., 2019). This is further endorsed by upper-echelon theory in that female directors are kind and therefore more prone to social and philanthropic activities, which influence firms' decisions in favor of stakeholders (Hambrick & Mason, 1984; Zahid et al., 2019). Drawing upon agency theory, BGD is a vital dimension of CG that augments board independence and monitoring by raising critical questions and opposing firms' immoral and unethical policies, positively influencing QCSD (Freeman, 1984; Issa et al., 2022; Jensen & Meckling, 1976; Nguyen et al., 2020). Many empirical studies also concluded that female directors have a significant positive effect on firms' QCSD (Issa et al., 2022; Katmon et al., 2019; Oino & Liu, 2022; Shaheen et al., 2021; Zahid, Rehman, Ali, et al., 2020), especially in countries with a weak CG structure, inferior institutional quality, and gender inequalities (Low et al., 2015; Rahman et al., 2022; Zahid, Rahman, Ali, et al., 2020). However, conversely, some researchers also documented that female directors have a negative or no relationship with QCSD due to their less aggressive and overcautious approach, which wastes the time, energy, and resources of the firms (Adams & Ferreira, 2009; Handajani et al., 2014; Khan, 2010; Yang et al., 2019). Given this contradiction, the following hypothesis is established for further investigation:

H1. Firms with female directors have better QCSD than others or those without their representation.

3.2.2 | Female tokenism or critical mass representation and QCSD

Tokenism theory assumes no significant or positive role for female directors, especially when firms showcase one or two of them on the board to gain legitimacy, show regulatory compliance, or diffuse stakeholders' pressure (Carter et al., 2010; Torchia et al., 2011). The theory also assumes that female directors have no productive role unless they are at least three or more on the board (Konrad et al., 2008; Owen & Temesvary, 2018). Empirically, many researchers also assert that female directors improve firms' CSR disclosures when they are three or more (Amorelli & García-Sánchez, 2020; De Masi et al., 2021; García-Sánchez et al., 2020; Muttakin et al., 2022). However, on the contrary, some researchers support "symbolism or tokenism" and oppose the "critical mass" representation of female directors (Low et al., 2015; Rahman et al., 2022; Zaichkowsky, 2014). Opposing the "critical mass assumption", Pucheta-Martínez et al. (2019) noted that female independent directors improve CSR reporting until their representation surpasses a specific limit. Moreover, some studies also found that neither "tokenism" (Yang et al., 2019) nor "critical mass" assumptions have any significant association with CS disclosures (Post et al., 2011; Yang et al., 2019). Given this incongruence of the prior scarce literature, the following hypothesis is established for further investigation:

H2. The positive role of three or more female directors is more pronounced than one or two female directors in improving QCSD.

3.2.3 | Female directors' position (independent and executive) and QCSD

Stakeholder theory assumes that female independent directors better facilitate firms in terms of effective communication and establishing sustainable relationships with stakeholders due to their amicable and participative leadership style and a rich network of contacts (Adams & Ferreira, 2009; Ali Gull et al., 2022; Zhang et al., 2013). Referring to agency theory, female independent directors augment the board's oversight role due to their no-to-low affiliation with the "old boys club" that improves the quality of voluntary and non-voluntary disclosures (Adams & Ferreira, 2009; Ali Gull et al., 2022; Carter et al., 2010) thus, mitigating corporate frauds and agency costs (Cumming et al., 2015; Nadeem, 2020). However, the theory assumes that female executive directors, being part of the management, are less effective monitors than their independent female colleagues (Ali Gull et al., 2022; Arun et al., 2015) Empirically, many studies noted that female independent directors contribute more to the enrichment of CSR and its reporting (Ali Gull et al., 2022; Jin et al., 2021; Pucheta-Martínez et al., 2019) than their male independent and female executive colleagues (Ali Gull et al., 2022). Other studies asserted that both female independent and executive directors positively influence firms' CSR, environmental performance, and the reporting of these elements (Al-Najjar & Salama, 2022; Prabowo et al., 2017; Shaheen et al., 2021). Nevertheless, it has also been found that neither independent (Yang et al., 2019) nor executive female directors have any significant concern with CSR (Ali Gull et al., 2022). To sum up, the prior literature is not only scant but also incongruent. Hence, the following hypothesis is formulated for further inquiry:

H3. The positive role of female independent directors is more pronounced than that of female executive directors in improving QCSD.

3.2.4 | Female directors' experience and QCSD

Stakeholder and upper-echelon theories assume that the experience of female directors fortifies their understanding and response to stakeholders' legitimate demands (Galbreath, 2018; Rahman, Zahid, & Khan, 2021), which positively influences firms' social and environmental performance and their reporting (Ali Gull et al., 2022; Zhang et al., 2013). Aligned with upper-echelon theory, experienced female directors come up with more unique and effective solutions for different complex problems, which have positive implications for firms' sustainable performance and its reporting (Galbreath, 2018; Giannarakis, 2014; Rahman et al., 2022). However, Issa et al. (2022) did not find any significant connection between female directors' experience and firms' sustainable performance, possibly due to their no-to-low awareness of the new technologies and current market trends or challenges (Rahman, Khan, & Zahid, 2021). Oino and Liu (2022) noted that the average age of female directors negatively affects CSR. The empirical literature in the area is not only scarce but also incongruent, which may be due to not differentiating the experience of female "independent" and "executive" directors, among other factors (Issa et al., 2022; Rahman, Khan, & Zahid, 2021). Because, it could be inferred that female executive directors may have rich firm-specific information due to their direct involvement in the different decisions and operations of the organization. Similarly, female independent directors are likely to be more experienced in dealing with diverse stakeholders due to their service on the boards of different organizations (Al-Najjar & Salama, 2022; Ali Gull et al., 2022; Prabowo et al., 2017; Shaheen et al., 2021). With this in mind, it is assumed that the experience of female directors obtained by serving different boards may be richer than that earned in a specific firm, especially in managing stakeholders through CS and its reporting. Given the lack of specific empirical literature in the area, there is a need for further investigation; hence, the following hypothesis is formulated:

H4. The positive role of female independent directors' experience is more pronounced than that of female executive directors' experience in improving QCSD.

3.2.5 | Female directors' education level and QCSD

The assumptions of agency and stakeholder theories support the notion that higher levels of female directors' education (master's, M. Phil., and Ph.D. degrees) have positive effects on QCSD through augmenting cognitive independence and monitoring of the board and increasing merit and transparency in the reporting of financial and non-financial information of an organization (Hambrick & Mason, 1984; Katmon et al., 2019; Rahman, Khan, & Zahid, 2021; Zhu & Zhang, 2022). Empirically, many studies found that highly educated female directors have a positive relationship with firms' CSR disclosure, which may be due to the good quality of their education or its better utilization in terms of decision-making (Terjesen et al., 2009; Zhai & Gao, 2015; Zhu & Zhang, 2022). Compared to their less or low educated female colleagues, women directors with higher educational levels develop better strategies, especially in following market trends (Issa et al., 2022; Oino & Liu, 2022; Zhu & Zhang, 2022). Molinero-Díez et al. (2022) found that female directors who hold bachelor's or master's degrees improve firms' social and economic performance. However, Yang et al. (2019) and Elmagrhi et al. (2019) did not find any significant relationship of female directors' higher education with firms' CSR, environmental performance, and voluntary disclosures. The existing literature is limited and incongruent; hence, the following hypothesis is established for further investigation:

> **H5.** The positive role of female directors who hold a master's or above degree is more pronounced than those who hold a bachelor's or below degree in improving QCSD.

3.2.6 | Female directors' educational background and QCSD

Following upper-echelon theory, the educational background of female directors plays a vital role in shaping their intellectual abilities, cognitive preferences, and judgmental skills, which influence the quality of firms' strategies and decisions by collecting, processing, and analyzing important and strategic information (Aspen Institute, 2008; Clark & Maggitti, 2012; Hambrick & Mason, 1984). For instance, it is noted that directors with education in management, social, or environmental sciences are likely to be more aware and, thus, more sensitive to different emerging social and ecological challenges, which positively influences firms' CS and its reporting (Abdul Wahab et al., 2018; Katmon et al., 2019; Rahman et al., 2018; Rahman, Khan, & Zahid, 2021). Similarly, directors with business education assist firms in analyzing and reporting the financial aspects of different CS proposals and projects (Amran & Haniffa, 2011; Molinero-Díez et al., 2022). Hence, female directors' business education (Molinero-Díez et al., 2022) and MBA degree were found to improve CSR (Aspen Institute, 2008). However, Yang et al. (2019) documented that female directors' MBA degree has no significant or positive association with CSR. Given the inconclusiveness of the prior literature, the following hypothesis is formulated for further inquiry:

> **H6.** The positive role of female directors' business-related education is more pronounced than their non-business education in improving QCSD.

3.2.7 | Female directors on audit committee and QCSD

Drawing upon stakeholder and agency theories, female directors are not only social and kind but also more critical and cautious in sensitive tasks, especially in financial and regulatory matters; hence, their presence on AC is likely to increase merit and transparency in firm's investments and spendings on CS and their reporting (Appuhami & Tashakor, 2017; Wang & Sun, 2022). Many empirical studies found that the size, frequency of meetings, independence (Appuhami & Tashakor, 2017), and gender diversity of AC have positive implications for CSR, ESG, and their reporting (Appuhami & Tashakor, 2017; Pitenoei et al., 2022; Wang & Sun, 2022). Pucheta-Martínez et al. (2023) also found that BGD positively moderates the negative association of independent and executive directors on ACs with CSR disclosures. However, Nugraheni et al. (2022) oppose any significant relationship between female directors' AC membership and CSR disclosure. Prior studies are not only limited but also lack agreement. Therefore, the following hypothesis is formulated for further investigation:

> **H7.** The female directors on AC improve QCSD.

4 | RESEARCH DESIGN

After excluding banks and financial companies due to their different CG and disclosure requirements, the minimum sample size was 232 companies from a population of 581 non-financial companies registered in 34 sectors of PSX at the end of 2011 (Table 1). Although the calculated sample size was appropriate as per Slovin's (1960) formula, the study still selected a comparatively large stratified random sample of 320 non-financial companies due to possible missing values and outliers. The study collected data on all variables from annual and sustainability reports of the sample firms for 10 years from 2012 to 2021. After identifying and addressing 7 missing values and 13 outliers, the final sample of the study remained 300 non-financial companies as reported in Table 1. The QCSD was measured using a scoring index adopted from Zahid et al. (2019) and Zahid, Rahman, Khan, et al. (2020). The index composed of 50 items covers all three core aspects of CS, namely, environmental, social, and economic sustainability. The selection was preferred over other indices, especially the index of Pucheta-Martínez et al. (2021), which is composed of 112 items but covers only two CS dimensions: social and environmental sustainability. Furthermore, the employed index is also more relevant and appropriate due to its compatibility with the GRI, which is the SECP's recommended framework for

TABLE 1 Population and sample of the study.

Serial number	Sectors	Total	Initial sample	Final sample
1	Automobile assembler	12	10	8
2	Automobile parts and accessories	10	7	5
3	Cable and electrical goods	8	6	2
4	Cement	21	18	16
5	Chemical	29	24	20
6	Closed-end mutual fund	8	6	3
7	Commercial banks	23	19	17
8	Engineering	19	15	11
9	Fertilizer	7	5	2
10	Food and personal care products	21	18	15
11	Glass and ceramics	10	6	4
12	Insurance	32	26	23
13	Inv. banks/inv. cos./securities cos.	29	21	17
14	Jute	2	2	2
15	Leasing companies	10	6	5
16	Leather and tanneries	5	3	1
17	Miscellaneous	22	18	7
18	Modarabas	31	26	19
19	Oil and gas exploration companies	4	3	2
20	Oil and gas marketing companies	8	6	3
21	Paper and board	10	7	3
22	Pharmaceuticals	11	7	5
23	Power generation and distribution	19	11	5
24	Real estate investment trust	1	1	1
25	Refinery	4	3	2
26	Sugar and allied industries	34	26	15
27	Synthetic and rayon	12	8	5
28	Technology and communication	10	7	4
29	Textile composite	56	43	23
30	Textile spinning	83	63	37
31	Textile weaving	15	12	7
32	Tobacco	3	3	2
33	Transport	5	5	4
34	Vanaspati and allied industries	5	5	3
35	Woolen	2	2	2
	TOTAL	581	320	300

Source: Pakistan Stock Exchange (2019).

CS reporting in Pakistan. The index used in this study has already been tested and validated in Pakistan and Malaysia (Rahman et al., 2022; Rahman, Zahid, & Khan, 2021).

According to the index, the maximum score that a firm can achieve is 150 (50 * 3) divided by 100. The weights were assigned to different disclosures based on their perceived importance as per the following criteria (Saleh et al., 2010). First, quantitative disclosures received the highest weight of 3, followed by the next highest weight of 2 assigned to a specific type of a qualitative disclosure (a non-quantitative disclosure but with specific information). Lastly, the lowest weight of 1 was assigned to specific qualitative disclosure (general quantitative disclosure). Moreover, firms with no disclosures on a specific item from the index received a score of 0. In addition to QCSD, the measurement details of all of the other variables used in the following estimation models are provided in Table 2.

$$\begin{aligned}QCSD_{it} = {} & \beta_0 + \beta_1 FDD_{it} + \beta_2 FDEXP_{it} + \beta_3 ACS_{it} + \beta_4 ACI_{it} + \beta_5 BSIZ_{it} \\ & + \beta_6 BIND_{it} + \beta_7 ACM_{it} + \beta_8 BM_{it} + \beta_{9it} ROA + \beta_{10} LQCSD_{it} \\ & + \beta_{11} FAGE_{it} + \beta_{12} FSIZE_{it} + \beta_{13} FLEVG_{it} + \beta_{14} ID_{it} + \beta_{15} TD_{it} \\ & + \varepsilon_{it} \ldots\ldots \text{Model 1}\end{aligned}$$

TABLE 2 Definition and operationalization of variables.

Variable	Description/explanation		Measurement	Reference
Dependent variable				
QCSD	Quality of corporate sustainability disclosures		QCSD is measured on the adopted index as explained above	Zahid et al. (2019); Zahid, Rehman, Ali, et al. (2020)
Independent variables				
Exp. sign				
FDD	+	Female director(s) (dummy)	A dummy variable coded 1 for the presence of female director(s) on the board and 0 otherwise	Rahman, Zahid, and Khan (2021)
PFD	+	The proportion of female directors	The proportion of female directors to total directors	Rahman, Zahid, and Khan (2021)
1FD	+	One female director	A dummy variable coded 1 for one female director on board and 0 otherwise	Fan et al. (2019)
2FD	+	Two female directors	A dummy variable coded 1 for two female directors on board and 0 otherwise	Fan et al. (2019)
3FD	+	Three or more female directors	A dummy variable coded 1 for at least three or more female directors on board and 0 otherwise	Rahman et al. (2022)
FDEXP	+	Female directors' experience	The number of years served on the board	Issa et al. (2022)
FID	+	Female independent directors	The proportion of female independent directors on the board	Fan et al. (2019); Yang et al. (2019)
FED	+	Female executive directors	The proportion of female executive directors on the board	Al-Najjar and Salama (2022)
FIDEX	+	Female independent directors' experience	The number of years served on the boards	Authors' measurement by following Issa et al. (2022)
FEDEX	+	Female executive directors' experience	The number of years served on the boards	Authors' measurement by following Issa et al. (2022)
FMD	+	Female directors' master's or above degree	The proportion of female directors having a master's or above degree	Molinero-Díez et al. (2022); Yang et al. (2019)
FBD	+	Female directors' bachelor's or below degree	The proportion of female directors having a bachelor's or below degree	Molinero-Díez et al. (2022); Yang et al. (2019)
FBE	+	Female directors' business education	The proportion of female directors with business education	Molinero-Díez et al. (2022)
FNBE	+	Female directors' non-business education	The proportion of female directors with non-business education	Molinero-Díez et al. (2022)
FAC	+	Female directors on the audit committee	The proportion of female directors on the audit committee	Nugraheni et al. (2022)
Control variables				
ACS	+	Audit committee size	Total number of directors on the audit committee	Appuhami and Tashakor (2017)
ACI	+	Audit committee independence	The proportion of independent directors on the audit committee	Appuhami and Tashakor (2017)
BSIZ	+	Board size	Number of total members on the board	Rahman, Zahid, and Khan (2021)
BIND	+	Board independence	The proportion of independent directors on the audit committee	Rahman, Zahid, and Khan (2021)
ACM	+	Audit committee meetings	Number of annual meetings of the audit committee	Appuhami and Tashakor (2017)
BM	+	Board meetings	Number of annual meetings of the audit committee	Rahman and Zahid (2021)
ROA	+	Return on assets	Firm's profit before interest and taxes divided by its total assets	Rahman, Zahid, and Khan (2021)
LQCSD	+	Lag QCSD	1-year lag of QCSD	
FAGE	+	Firm age	Number of years since a firm listed on the stock market	Rahman, Zahid, and Khan (2021)

(Continues)

TABLE 2 (Continued)

Variable	Description/explanation		Measurement	Reference
FSIZE	+	Firm size	Log of the total assets (in million rupees)	Rahman, Zahid, and Khan (2021)
FLEVG	+	Firm leverage	Total debt to assets ratio	Rahman, Zahid, and Khan (2021)
ID	+/−	Industry dummies	Industry dummies for 34 sectors	Rahman et al. (2022)
TD	+/−	Time dummies	Time dummies for 10 years	Rahman et al. (2022)

$$QCSD_{it} = \beta_0 + \beta_1 PFD_{it} + \beta_2 FDEXP_{it} + \beta_3 ACS_{it} + \beta_4 ACI_{it} + \beta_5 BSIZ_{it} + \beta_6 BIND_{it} + \beta_7 ACM_{it} + \beta_8 BM_{it} + \beta_{9it} ROA + \beta_{10} LQCSD_{it} + \beta_{11} FAGE_{it} + \beta_{12} FSIZE_{it} + \beta_{13} FLEVG_{it} + \beta_{14} ID_{it} + \beta_{15} TD_{it} + \varepsilon_{it} \ldots\ldots \text{Model 2}$$

$$QCSD_{it} = \beta_0 + (\beta_1 1FD_{it}/\beta_1 2FD_{it}/\beta_1 3FD_{it}) + \beta_2 FDEXP_{it} + \beta_3 ACS_{it} + \beta_4 ACI_{it} + \beta_5 BSIZ_{it} + \beta_6 BIND_{it} + \beta_7 ACM_{it} + \beta_8 BM_{it} + \beta_{9it} ROA + \beta_{10} LQCSD_{it} + \beta_{11} FAGE_{it} + \beta_{12} FSIZE_{it} + \beta_{13} FLEVG_{it} + \beta_{14} ID_{it} + \beta_{15} TD_{it} + \varepsilon_{it} \ldots\ldots \text{Model 3 to Model 5}$$

$$QCSD_{it} = \beta_0 + \beta_1 FID_{it} + \beta_2 FED_{it} + \beta_3 FIDEX_{it} + \beta_4 FEDEX_{it} + \beta_5 ACS_{it} + \beta_6 ACI_{it} + \beta_7 BSIZ_{it} + \beta_8 BIND_{it} + \beta_9 ACM_{it} + \beta_{10} BM_{it} + \beta_{11it} ROA + \beta_{12} LQCSD_{it} + \beta_{13} FAGE_{it} + \beta_{14} FSIZE_{it} + \beta_{15} FLEVG_{it} + \beta_{16} ID_{it} + \beta_{17} TD_{it} + \varepsilon_{it} \ldots\ldots \text{Model 6}$$

$$QCSD_{it} = \beta_0 + \beta_1 FMD_{it} + \beta_2 FBD_{it} + \beta_3 FIDEX_{it} + \beta_4 FEDEX_{it} + \beta_5 ACS_{it} + \beta_6 ACI_{it} + \beta_7 BSIZ_{it} + \beta_8 BIND_{it} + \beta_9 ACM_{it} + \beta_{10} BM_{it} + \beta_{11it} ROA + \beta_{12} LQCSD_{it} + \beta_{13} FAGE_{it} + \beta_{14} FSIZE_{it} + \beta_{15} FLEVG_{it} + \beta_{16} ID_{it} + \beta_{17} TD_{it} + \varepsilon_{it} \ldots\ldots \text{Model 7}$$

$$QCSD_{it} = \beta_0 + \beta_1 FBE_{it} + \beta_2 FNBE_{it} + \beta_3 FIDEX_{it} + \beta_4 FEDEX_{it} + \beta_5 ACS_{it} + \beta_6 ACI_{it} + \beta_7 BSIZ_{it} + \beta_8 BIND_{it} + \beta_9 ACM_{it} + \beta_{10} BM_{it} + \beta_{11it} ROA + \beta_{12} LQCSD_{it} + \beta_{13} FAGE_{it} + \beta_{14} FSIZE_{it} + \beta_{15} FLEVG_{it} + \beta_{16} ID_{it} + \beta_{17} TD_{it} + \varepsilon_{it} \ldots\ldots \text{Model 8}$$

$$QCSD_{it} = \beta_0 + \beta_1 FAC_{it} + \beta_2 FIDEX_{it} + \beta_3 FEDEX_{it} + \beta_4 ACS_{it} + \beta_5 ACI_{it} + \beta_6 BSIZ_{it} + \beta_7 BIND_{it} + \beta_8 ACM_{it} + \beta_9 BM_{it} + \beta_{10} ROA_{it} + \beta_{11} LQCSD_{it} + \beta_{12} FAGE_{it} + \beta_{13} FSIZE_{it} + \beta_{14} FLEVG_{it} + \beta_{15} ID_{it} + \beta_{16} TD_{it} + \varepsilon_{it} \ldots\ldots \text{Model 9}$$

The ε_{it} denotes the error term, and the subscripts of *i* and *t* represent industry and year, respectively.

5 | METHODS, FINDINGS, AND DISCUSSION

5.1 | Descriptive statistics

Table 3 shows an average value of 0.544 for QCSD. The statistics also display an average of 11.04% (0.1104) for the proportion of female directors (PFD), where 5.32% (0.0532) are independent (FID) and 3.54% (0.0354) are executive female directors (FED). The frequency distribution shows that only 11.5% of the sample firms have female directors on their boards (FDD), while 88.5% have not represented them on the board. A deeper examination reveals that 6.5% of these firms have one (1FD), 3.17% have two (2FD), and only 1.83% have three or more female directors (3FD).

Table 3 also shows that female directors' average experience (FDEXP) is 10.93 years, where a mean value of 2.820 years is related to female independent directors (FIDEX) and an average value of 5.760 years belongs to female executive directors (FEDEX). The comparison shows that the representation of FID is marginally higher than FED, but the latter is slightly more experienced than the former. The statistics also show that only 27.9% of the female directors have master's or above degrees (FMD), while 72.1% have a bachelor's or below degree (FBD), which explains the lack of highly educated female directors in Pakistani boards. Furthermore, the findings reveal that an average of 77.1% (0.771) of the female directors have received business education (FBE) in comparison to 22.9% (0.229) of those who have not (FNBE). In addition, the table also shows that the average value for the proportion of female directors on the audit committee (FAC) is only 1.93% (0.0193), which is very low. Among the control variables, the mean values for the size (ACS) and independence of the audit committee (ACI) are 3.88% and 28.5%, while board size (BS) and board independence (BIND) have average values of 8.60% and 18.4%, respectively. The average values for the meeting frequency of the audit committee (ACM) and the board (BM) are 4.40 and 5.41, respectively. The ROA and age (FAGE), size (FSIZE), and leverage (FLEVG) of the sample firms have mean values of 22.883%, 33.23%, 745.732%, and 56.421%, respectively.

5.2 | Pearson's correlation matrix

The Pearson's correlation matrix reported in Table 4 shows a significant positive association of all proxies representing different numerical representations of female directors such as FDD, PFD, 1FD, 2FD, and 3FD with QCSD. Similarly, the combined experience (FDEXP) of female independent (FID) and executive directors (FED) has a significant positive correlation with QCSD, but separately the findings are only true for FID and not for FED, whose association with QCSD is insignificant. In addition, female directors with a master's or above degree (FMD) are significantly and positively associated with QCSD, while their female colleagues with a bachelor's or below degree (FBD) have an insignificant positive association. Likewise, the female directors with business (FBE) and non-business (FNBE) education are positively correlated with QCSD, but, the magnitude of the former is slightly higher than that of the latter. The presence of female directors on the AC also positively correlates with QCSD. Among the control variables, ACS, ACI, BS, BIND, BM, FSIZE, and FLEVG have a significant positive, while ACM and FAGE have no significant association with QCSD.

TABLE 3 Descriptive statistics.

	Min	Max	Mean	SD	Skewness		Kurtosis	
					Stat	SE	Stat	SE
QCSD	0.200	0.780	0.544	0.157	0.654	.082	0.111	.164
PFD	0.000	0.500	0.1104	0.142	1.460	.082	0.686	.164
FID	0.00	0.43	0.0532	0.04837	0.00	.082	0.295	.164
FED	0.00	0.17	0.0354	0.02348	0.00	.082	0.694	.164
FDEXP	0	52	10.93	8.953	1.455	.082	0.178	.164
FIDEX	0	29	2.820	3.377	1.794	.082	0.235	.164
FEDEX	0	52	5.760	8.372	1.513	.082	0.632	.164
FMD	0	3.00	0.279	0.594	0.328	.082	0.103	.164
FBD	0	1.00	0.721	7	0.800	.082	0.546	.164
FBE	0.00	1.00	0.771	0.354	1.404	.082	0.563	.164
FNBE	0.00	1.00	0.229	0.045	0.525	.082	0.227	.164
FAC	0.00	0.33	0.0193	0.07202	0.620	.082	0.629	.164
ACS	3	9	3.88	1.000	0.338	.082	0.338	.164
ACI	0.000	0.800	0.285	0.190	0.488	.082	0.200	.164
BS	7	16	8.60	1.687	0.332	.082	1.675	.164
BIND	0.000	0.750	0.184	.136	0.946	.082	1.049	.164
ACM	0	23	4.40	1.143	0.527	.082	0.020	.164
BM	0	28	5.41	1.924	0.865	.082	0.144	.164
ROA	0.000	130.000	22.883	8.096	0.134	.082	0.452	.164
FAGE	3	153	33.23	18.190	0.186	.082	0.622	.164
FSIZE	1.943	11.821	0.746	0.944	1.016	.082	0.021	.164
FLEVG	0.000	18.190	0.56421	0.993	0.118	.082	0.132	.164

Frequencies			Yes	No	%yes	%no	Cum.% - yes/no	
FDD	0	1	345	2655	11.50	88.50	11.50	100
1FD	0	1	195	2805	6.50	93.50	6.50	100
2FD	0	1	95	2905	3.17	96.83	3.17	100
3FD	0	1	55	2945	1.83	98.17	1.83	100

Although all correlations are below the multicollinearity threshold of 0.8 (Wooldridge, 2013; Zahid, Rahman, Khan, et al., 2020), still some of these are understandably high due to the proximity of the predictors representing different numerical representations and other attributes of the female directors. For instance, the association of PFD and FMD with FDD denoted by 0.78*** and 0.59***, respectively, and the correlation between FMD and PFD represented by 0. 0.60*** are marginally below the cutoff value of multicollinearity. Besides the correlation of FEDEX and FMD with FEDEXP represented by 0.78***and 0.79***, respectively, the association (0.79***) of FBE with 3FD, and the correlation of FNBE with 2FD (0.65***) and FID (0.79***) are also slightly high. However, all of these highly correlated predictors are separated, and none of them exist or estimated in a single model of the study (Model 1 to Model 9) as reported in Tables 5–8.

5.3 | Estimation approach

The statistics of the Breusch–Pagan/Cook–Weisberg test provide evidence for the heteroscedasticity in all models of the study as reported in Tables 5–8. However, the Durbin–Watson statistics show no autocorrelation in any model of the study. This study, therefore, employed ordinary least squares with panel-corrected standard errors (OLS-PCSEs), which ensures unbiased and efficient estimation. The OLS-PCSEs estimator is preferred over others such as OLS, fixed effects (FE), and random effects (RE) in computing data with heteroscedasticity and cross-sectional dependence. However, the estimator is sensitive to serial correlation; thereby, despite no autocorrelation, the study used a 1-year lag of the output variable—QCSD as a predictor in all regression estimations reported in Tables 5–8 (Beck & Katz, 1995; Rahman & Zahid, 2021; Zahid, Rahman, Khan, et al., 2020).

5.4 | Findings and discussion

The statistics reported in Table 5 explain that firms with female directors (FDD) on their boards have better QCSD than others or those with their no representation on the board (Model 1). The findings that support hypothesis H1 are further endorsed by the significant positive

TABLE 4 Pearson correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1 QCSD	1.00																									
2 FDD	0.13***	1.00																								
3 PFD	0.08*	0.78***	1.00																							
4 1FD	0.14***	0.33***	0.31***	1.00																						
5 2FD	0.12***	0.34***	0.28***	−0.06	1.00																					
6 3FD	0.09*	0.25***	0.24***	−0.04	−0.04	1.00																				
7 FID	0.10**	0.21***	0.07*	0.20***	0.47***	−0.03	1.00																			
8 FED	0.06	0.26***	0.30***	0.14***	0.38***	0.29***	−0.03	1.00																		
9 FDEXP	0.11**	0.42***	0.48***	0.40***	0.24***	0.20***	0.12***	0.24***	1.00																	
10 FIDEX	0.16***	0.19***	0.06	0.21***	0.04	−0.02	0.28***	−0.03	0.36***	1.00																
11 FEDEX	0.05	0.44***	0.43***	0.34***	0.25***	0.22***	0.02	0.27***	0.78***	−0.02	1.00															
12 FMD	0.12***	0.59***	0.60***	0.26***	0.27***	0.39***	0.09**	0.28***	0.79***	0.19***	0.46***	1.00														
13 FBD	0.06	0.15***	0.13***	0.08*	0.14***	−0.01	0.16***	−0.02	0.20***	0.23***	0.12***	0.00	1.00													
14 FBE	0.17***	0.43***	0.41***	0.24***	0.41***	0.79***	0.09**	0.47***	0.43***	0.00	0.46***	0.58***	0.07*	1.00												
15 FNBE	0.13***	0.22***	0.09**	0.17***	0.65***	−0.03	0.79***	0.27***	0.15***	0.23***	0.07*	0.07*	0.14***	0.12***	1.00											
16 FAC	0.18***	0.42***	0.41***	0.42***	0.45***	0.17***	0.40***	0.08*	0.38***	0.01	0.40***	0.38***	0.07*	0.50***	0.28***	1.00										
17 ACS	0.19***	−0.01	−0.07*	−0.04	0.04	0.10**	0.08*	0.08*	−0.05	−0.03	−0.04	−0.04	−0.08*	0.06	0.12***	−0.02	1.00									
18 ACI	0.19***	0.03	−0.01	0.10**	−0.01	0.05	−0.03	0.04	0.01	0.09**	−0.03	−0.03	0.15***	0.08*	−0.04	0.03	−0.08*	1.00								
19 BS	0.21***	0.05	−0.10**	−0.10**	0.03	0.06	0.06	0.07	−0.05	0.05	−0.08*	−0.05	−0.09*	0.00	0.12***	−0.05	0.35***	0.15***	1.00							
20 BIND	0.19***	−0.08*	−0.09**	0.12***	−0.06	−0.05	−0.02	−0.01	−0.03	0.05	−0.05	−0.09**	−0.05	−0.04	−0.01	0.03	0.15***	0.62***	0.18***	1.00						
21 ACM	0.05	−0.05	−0.05	−0.01	−0.01	0.03	−0.02	−0.01	0.20***	−0.01	0.22***	0.12***	0.05	0.01	0.00	0.01	0.07*	0.03	0.02	0.09**	1.00					
22 BM	0.11**	−0.04	−0.07	−0.07*	0.05	0.00	−0.04	0.06	0.11**	0.02	0.11***	0.02	0.00	−0.01	0.06	−0.05	0.11**	0.17***	0.13***	0.23***	0.40***	1.00				
23 ROA	−0.03	−0.00	0.01	−0.01	0.09*	−0.03	0.00	−0.01	0.01	−0.01	0.02	0.00	0.01	0.01	0.04	0.01	−0.01	−0.01	−0.01	−0.04	−0.04	0.03	1.00			
24 FAGE	0.01	−0.11**	0.00	−0.04	0.08*	−0.14***	−0.06	−0.03	−0.01	−0.17***	0.06	−0.01	−0.07*	−0.06	−0.05	0.06	−0.04	0.05	−0.01	−0.03	0.00	0.02	0.02	1.00		
25 FSIZE	0.20***	−0.00	−0.09**	−0.03	0.02	0.03	−0.02	0.03	−0.03	0.12***	−0.08*	−0.07*	0.01	0.03	0.00	−0.01	0.12***	0.27***	0.27***	0.28***	0.08*	0.18***	−0.06	−0.02	1.00	
26 FLEVG	0.08*	−0.03	−0.09*	0.02	0.02	−0.12***	0.10**	−0.10**	−0.02	0.05	−0.04	−0.09**	0.10**	−0.11**	0.07*	0.08*	−0.04	−0.04	−0.06	−0.03	0.05	0.05	0.02	0.01	−0.04	1.00

*$p < .05$, **$p < .01$, and ***$p < .001$.

TABLE 5 Regression analyses.

Variables	Model 1 QCSD	Model 2 QCSD
Female directors dummy (FDD)	.298***	—
	(.065)	—
The proportion of female director (PFD)	—	.84***
	—	(.267)
Female directors' experience (FDEXP)	.009**	.011***
	(.004)	(.003)
Audit committee size (ACS)	.137***	.14***
	(.03)	(.031)
Audit committee independence (ACI)	.689***	.713***
	(.147)	(.148)
Board size (BSIZ)	.036***	.046***
	(.012)	(.01)
Board independence (BIND)	.098	.057
	(.227)	(.232)
Audit committee meetings (ACM)	−.017	−.021
	(.026)	(.026)
Board meetings (BM)	.001	0.01
	(.02)	(.02)
Return of assets (ROA)	0.001	0.001
	(0.001)	(0.001)
Lag quality of CS disclosures (LQCSD)	.01**	.01**
	(.005)	(.005)
Firm age (FAGE)	−.002	−.002
	(.001)	(.001)
Firm size (FSIZE)	.073*	.08**
	(.039)	(.038)
Firm leverage (FLEVG)	0.1***	.107***
	(.024)	(.024)
Constants	−1.298***	−1.357***
	(.226)	(.222)
R-squared	.118	.116
Heteroscedasticity	0.44***	0.43***
Autocorrelation (DW)	2.06	2.06
Year dummies	Yes	Yes
Industry dummies	Yes	Yes

Note: Standard errors are in parentheses.
*$p < .1$, **$p < .05$, and ***$p < .01$.

effect of the proportion of female directors (PFD) on QCSD (Model 2). The findings suggest that female directors, being more generous and caring, influence boardroom decisions in favor of stakeholders and oppose managers' illegal and unethical policies, which has positive implications for the quality of firms' social and environmental performance and their reporting (Al-Najjar & Salama, 2022; Galbreath, 2018; Shaheen et al., 2021). These findings are consistent with stakeholder, agency, and upper-echelon theories, which support female directors for the promotion of CS and its reporting by improving the quality of the board's monitoring, strategies, and decisions due to their compassionate, independent, critical, and overcautious nature (Freeman, 1984; Hambrick & Mason, 1984; Jensen & Meckling, 1976). The results also endorse many previous studies advocating that female directors have unique feminine attributes and strong analytical skills, which positively influence firms' financial and nonfinancial performance and the quality of their reporting (Issa et al., 2022; Katmon et al., 2019; Rahman & Zahid, 2021; Zahid et al., 2019). However, the findings are not aligned with Handajani et al. (2014) who found that female directors negatively affect firms' social responsibility disclosures, possibly due to contextual or methodological differences (Wang & Clift, 2009).

Further exploration of the matter revealed that the presence of one (1FD), two (2FD), and three or more (3FD) female directors on the board exerts a significant positive influence on QCSD, as shown in Table 6 (Model 3 to Model 5). Furthermore, the significant positive effect of female directors on QCSD slightly increases with the increase in their representation, as evidenced by the coefficients of 0.15***, 0.182***, and 0.53*** for 1FD (Model 3), 2FD (Model 4), and 3FD (Model 5), respectively. These findings, which support hypothesis H2, aligned with the results for PFD (Model 2 in Table 5), showing that an increase in the proportion of female directors on the board maximizes its positive effects on QCSD. However, the findings consistent with stakeholder, agency, and upper-echelon theories (Freeman, 1984; Hambrick & Mason, 1984; Jensen & Meckling, 1976) are not aligned with tokenism and critical mass theories. Following the prior literature, the positive findings for 1FD and 2FD explain that a female director is only nominated to the board for extra-ordinary talent and experience in a male-dominated corporate arena (Nekhili & Gatfaoui, 2012; Rahman et al., 2022). Hence, she is competent and confident enough to positively contribute to the board's roles without requiring the support of others or a second or third female director (Rahman et al., 2022; Zaichkowsky, 2014). Furthermore, a single female director may not be always marginalized, especially in Pakistan where they are highly regarded and, thus, carefully listened to by their male colleagues during board meetings and decision-making processes (Low et al., 2015; Rahman et al., 2022; Zahid, Rahman, Ali, et al., 2020). Overall, the findings are somewhat similar to several prior studies supporting symbolism and tokenism or opposing the critical mass representation of female directors (Rahman et al., 2022; Zaichkowsky, 2014). The findings are also consistent with Post et al. (2011) and Rahman et al. (2022) but inconsistent with De Masi et al. (2021) and García-Sánchez et al. (2020). The inconsistency may be an outcome of the contextual or methodological differences.

By examining the problem further as reported in Table 7 (Model 6), the different numerical representations of the female directors (Table 6) were replaced by the proportion of independent (FID) and executive (FED) female directors. The estimation shows that regardless of their position or status, female directors, whether independent or executive, play a significant positive role in improving QCSD. The

TABLE 6 Regression analyses.

Variables	Model 3 QCSD	Model 4 QCSD	Model 5 QCSD
One female director (1FD)	.15***	–	–
	(.052)	–	–
Two female directors (2FD)	–	.182***	–
	–	(.029)	–
Three female directors (3FD)	–	–	.53***
	–	–	(.085)
Female directors' experience (FDEXP)	.011***	.015***	.015***
	(.003)	(.005)	(.004)
Audit committee size (ACS)	.139***	.136***	.129***
	(.032)	(.032)	(.031)
Audit committee independence (ACI)	.725***	.736***	.684***
	(.141)	(.131)	(.142)
Board size (BSIZ)	.049***	.042***	.041***
	(.011)	(.011)	(.011)
Board independence (BIND)	.161	.047	.098
	(.213)	(.215)	(.242)
Audit committee meetings (ACM)	−.026	−.027	−.033
	(.025)	(.028)	(.027)
Board meetings (BM)	.006	−.005	−.002
	(.018)	(.02)	(.02)
Return of assets (ROA)	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
Lag quality of CS disclosures (LQCSD)	.009*	.01**	.01**
	(.005)	(.005)	(.005)
Firm age (FAGE)	−.002	−.002	−.002
	(.001)	(.001)	(.001)
Firm size (FSIZE)	.078**	.072**	.073**
	(.04)	(.036)	(.036)
Firm leverage (FLEVG)	.092***	.096***	.108***
	(.025)	(.025)	(.026)
Constants	−1.279***	−1.212***	−1.154***
	(.241)	(.234)	(.225)
R-squared	.11	0.114	.12
Heteroscedasticity	0.42***	0.83***	2.57***
Autocorrelation (DW)	1.99	1.98	1.99
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes

Note: Standard errors are in parentheses.
*$p < .1$, **$p < .05$, and ***$p < .01$.

findings indicate that FID are likely to be more vigilant, critical, and capable of raising their concerns regarding managers' those unethical policies and decisions which are implicitly or explicitly harmful to stakeholders' interests (Adams & Ferreira, 2009; Jin et al., 2021; Zhang et al., 2013). Likewise, the findings also imply that FED have richer firm-specific information that positively influences QCSD. Taken together, these findings endorse stakeholder and upper-echelon theories, both of which support BGD for developing and implementing effective strategies for the successful adoption and promotion of CS and its reporting (Freeman, 1984; Hambrick &

TABLE 7 Regression analysis.

Variables	Model 6 QCSD	Model 7 QCSD
Female independent directors (FID)	.293***	—
	(.058)	—
Female executive directors (FED)	.197**	—
	(.094)	
Female directors with master or above degree (FMD)	—	.492**
	—	(.226)
Female directors with bachelor or below degree (FBD)	—	.058
	—	(.061)
Female independent directors' experience (FIDEX)	.031***	.031***
	(.009)	(.008)
Female executive directors' experience (FEDEX)	.012***	.012**
	(.004)	(.005)
Audit committee size (ACS)	.133***	.142***
	(.032)	(.032)
Audit committee independence (ACI)	.723***	.665***
	(.134)	(.17)
Board size (BSIZ)	.037***	.042***
	(.011)	(.01)
Board independence (BIND)	.019	.063
	(.214)	(.242)
Audit committee meetings (ACM)	−.022	−.027
	(.027)	(.028)
Board meetings (BM)	−.001	.001
	(.019)	(.02)
Return of assets (ROA)	0.001	0.001
	(0.001)	(0.001)
Lag of the quality of CS disclosures (LQCSD)	.01*	.01*
	(.005)	(.005)
Firm age (FAGE)	−.002	−.002
	(.001)	(.001)
Firm size (FSIZE)	.066*	.066*
	(.04)	(.04)
Firm leverage (FLEVG)	.091***	.091***
	(.024)	(.024)
Constants	−1.187***	−1.251***
	(.238)	(.248)
R-squared	.117	.112
Heteroscedasticity	2.13***	2.46***
Autocorrelation (DW)	1.98	2.00
Year dummies	Yes	Yes
Industry dummies	Yes	Yes

Note: Standard errors are in parentheses.
*$p < .1$, **$p < .05$, and ***$p < .01$.

Mason, 1984). The findings are also consistent with previous studies showing that both the female independent and executive directors promote firms' environmental and sustainable performance and associated reporting (Al-Najjar & Salama, 2022; Jin et al., 2021; Prabowo et al., 2017; Shaheen et al., 2021). However, the comparison shows that the coefficient of 0.293*** for FID is slightly higher than 0.197** for FED, which supports hypothesis H3 of the study. Referring to the stakeholder and agency theories, FID are more capable than FED of protecting stakeholders' interests by opposing firms' unscrupulous and debauched policies and practices due to their sympathetic and independent nature (Adams & Ferreira, 2009; Freeman, 1984; Jensen & Meckling, 1976). However, FED, being part of management, may not be able to act in the same way as FID. Nevertheless, they are likely to augment the board's monitoring by keeping FID updated with firms' important internal information easily available to them due to their executive roles (Adams & Ferreira, 2009; Zhang et al., 2013). These findings are somewhat aligned with Ali Gull et al. (2022) who recommend an increase in FID rather than FED due to their strong monitoring abilities that improve QCSD.

The female directors' experience (FDEXP) with significant positive coefficients in Tables 5 and 6 (Model 1 to Model 5) was also replaced by the experience of independent (FIDEX) and executive female directors (FEDEX) as shown in Table 7 (Models 6 and 7). Like FDEXP, both the FIDEX and FEDEX also show a significant positive association with QCSD. The findings aligned with stakeholder and upper-echelon theories suggest that female directors' experience whether combined (FDEXP) or separated (FIDEX and FEDEX) improves QCSD as it enables firms to establish and expand sustainable relationships with stakeholders and increases meaningful engagements with them by reducing information asymmetry and enriching the quality of CS reporting (Ali Gull et al., 2022; Freeman, 1984; Hambrick & Mason, 1984). The findings are consistent with Galbreath (2018), Giannarakis (2014), and Rahman et al. (2022) but are inconsistent with Issa et al. (2022). The comparison of the coefficients reveals that the positive effect of FIDEX is slightly higher than the FEDEX on QCSD as reported in Table 7 (Models 6 and 7) and Table 8 (Models 8 and 9), which supports hypothesis H4. Drawing upon stakeholder, agency, and upper-echelon theories, FID are more effective monitors than FED due to having rich experience in dealing with diverse stakeholders in different organizations. Moreover, female independent directors are also more sensitive to stereotyping and reputational capital, which positively influence QCSD (Ali Gull et al., 2022; Freeman, 1984; Hambrick & Mason, 1984; Jensen & Meckling, 1976).

The FID and FED (Model 6) were also replaced by the proportion of female directors with master's or above degrees (M.Phil. and Ph.D.) (FMD) and bachelor's or below degrees (FBD) in Table 7 (Model 7). The estimation indicates that FMD has a significant positive effect on QCSD, while FBD has an insignificant positive effect. These findings that support hypothesis H5 can be plausibly explained by the fact that highly educated female directors are more aware and serious about different social and ecological challenges, thereby, proactively push firms toward improving their sustainable performance and its reporting (Hambrick & Mason, 1984; Issa et al., 2022; Katmon et al., 2019). Following stakeholder and upper-

TABLE 8 Regression analysis.

Variables	Model 8 QCSD	Model 9 QCSD
Female directors' business education (FBE)	.267***	–
	(.032)	–
Female directors' non-business education (FNBE)	.265***	–
	(.081)	–
The proportion of female directors on the audit committee (FAC)	–	.648***
	–	(.105)
Female independent directors' experience (FIDEX)	.032***	.036***
	(.01)	(.01)
Female executive directors' experience (FEDEX)	.003	.006**
	(.004)	(.002)
Audit committee size (ACS)	.115***	.141***
	(.03)	(.033)
Audit committee independence (ACI)	.583***	.723***
	(.132)	(.125)
Board size (BSIZ)	.038***	.042***
	(.012)	(.01)
Board independence (BIND)	.179	.104
	(.218)	(.209)
Audit committee meetings (ACM)	−.012	−.019
	(.027)	(.024)
Board meetings (BM)	.001	.009
	(.017)	(.017)
Return of assets (ROA)	0.001	0.001
	(0.001)	(0.001)
Lag of the quality of CS disclosures (LQCSD)	.009*	.01*
	(.005)	(.005)
Firm age (FAGE)	−.002	−.002
	(.001)	(.001)
Firm size (FSIZE)	.056*	.059*
	(.036)	(.037)
Firm leverage (FLEVG)	.1***	.072***
	(.023)	(.023)
Constants	−1.182***	−1.315***
	(.24)	(.243)
R-squared	.14	.134
Heteroscedasticity	5.80***	2.41***
Autocorrelation (DW)	2.01	1.99
Year dummies	Yes	Yes
Industry dummies	Yes	Yes

Note: Standard errors are in parentheses.
*$p < .1$, **$p < .05$, and ***$p < .01$.

echelon theories, the findings support the notion that female directors' higher education enriches their understanding and cognitive and analytical skills to better conceptualize and suggest effective solutions for different complex and non-routine issues, including those related to CS and its disclosure (Abdul Wahab et al., 2018; Freeman, 1984; Hambrick & Mason, 1984; Rahman, Khan, & Zahid, 2021). The findings are somewhat consistent with Issa et al. (2022), who noted a positive relationship between female directors' higher education and firms' sustainable performance but are inconsistent with Elmagrhi et al. (2019), who found that higher education of female directors has no significant relationship with firms' environmental performance disclosures.

In probing the matter further, the female directors' educational level (FMD and FBD) in Table 7 (Model 7) was replaced by their educational background, broadly divided into business (FBE) and non-business education (FNBE), as reported in Table 8 (Model 8). The estimation shows that both FBE and FNBE play an important role in promoting QCSD. Following stakeholder and upper-echelon theories, the findings suggest that both FBE and FNBE positively influence CS and its disclosure by triggering a fruitful discussion on their economic, social, environmental, legal, and political aspects in the boardroom (Clark & Maggitti, 2012; Freeman, 1984; Hambrick & Mason, 1984; Katmon et al., 2019; Yusoff, 2010). The comparison revealed that FBE's coefficient of 0.267*** is marginally higher than FNBE's coefficient of 0.267***, which supports hypothesis H6. The findings suggest that compared to FNBE, FBE improves QCSD more effectively probably due to their increased awareness of the importance of CS and its reporting. The findings are consistent with those of Amran and Haniffa (2011) who found that directors' business education positively influences CS and its reporting, but are inconsistent with Yang et al. (2019), who could not find any significant relationship between female directors' MBA degree and CSR. Lastly, FBE and FNBE (Model 8) were replaced by the proportion of female directors on the audit committee (FAC) in Table 8 (Model 9). The estimation showed that FAC exerts a significant positive effect on QCSD, which supports hypothesis H7. The findings explain that female directors' regularity, independence, and skeptical nature augment the oversight role of AC and have positive implications for firms' financial and non-financial performance and the quality of their reporting (Appuhami & Tashakor, 2017; Rahman et al., 2022; Wang & Sun, 2022). Based on stakeholder and agency theories, the caring nature and stringent monitoring skills of the female directors enable ACs to ensure merit and transparency in firms' spending on social and environmental welfare and their reporting (Freeman, 1984; Jensen & Meckling, 1976; Pitenoei et al., 2022; Wang & Sun, 2022). These findings are aligned with many previous studies (Appuhami & Tashakor, 2017; Pitenoei et al., 2022; Wang & Sun, 2022). Among the control variables, ACS, ACI, BSIZ, LQCSD, FSIZE, and FLEVG are significantly and positively associated with QCSD, while BIND and ROA have an insignificant positive association in all models of the study (Tables 5–8). However, FAGE along with BM and ACM have no significant relationship with QCSD as shown by their insignificant negative and positive coefficients in different models of the study (Tables 5–8).

6 | CONCLUSION, RECOMMENDATIONS, AND LIMITATIONS

This study explored important and rarely answered questions of whether it is the mere female directors or their different numerical representations on the board or their certain other attributes that matter for QCSD. The findings revealed that firms with female directors on the board, regardless of how many, have better QCSD than others or those with no representation on the board. The findings also revealed that an increase in the proportion of female directors on the board, as well as the audit committee, amplifies its positive effects on QCSD. Furthermore, it is also noted that both the female independent and executive directors and their experience have a positive role in improving QCSD. However, the role of female independent directors and their experience is marginally more pronounced than the female executive directors and their experience in improving QCSD. Likewise, female directors who hold a master's or above degree (M.Phil. or Ph. D.) have a significant positive effect on QCSD, while those with a bachelor's or below degree have no significant effect. In addition, the female directors' business and non-business education also positively contribute to the QCSD, but the contribution of the former is marginally higher than the latter.

This study contributes to the literature, theory, and practice in several ways. First, it enriches the prior extant literature that rarely adopted a holistic approach to assessing the impact of the different numerical representations and certain other attributes of female directors on QCSD. The previous studies mostly focused on "boardroom gender diversity" or "female or women directors" and their "experience" rather than differentiating them or their experience as female "independent" and "executive" directors. Similarly, these studies also either focused on the role of the level or background of female directors' education rather than both simultaneously, especially in enriching CS and its reporting. Second, the study also contributes to theory by using and testing the assumptions of multiple theories in hypothesizing and explaining different relationships as Nguyen et al. (2020) suggest, each theory has its limitations, and therefore, a single theory might not be sufficient to fully support or explain all hypotheses, especially in studies related to female directors. Third, the study also contributes to the theory by explaining the non-applicability of tokenism and critical mass theories for elevating QCSD in Pakistan. Fourth, the study contributes to the policy and practice by informing regulators, policymakers, and practitioners about the level of compliance with different CG codes (CCG 2012, 2017, and 2019) and CS and its reporting (such as CSR Order 2009 and CSR Voluntary Guidelines 2013). The significant positive findings for a single female director endorse the relevance and importance of CCG 2019, which mandated the presence of at least one female director on the board of each listed company in Pakistan (Saigal, 2020). Overall, the findings explain that its neither the tokenism nor critical mass representation of female directors but rather their certain other attributes such as position and experience (independent and executive), education (level and background), and AC membership that matter for improving QCSD. Therefore, firms should prioritize the independence, higher level of relevant education, experience, and monitoring skills of female directors in increasing BGD rather than blindly following the CG codes or the minimum threshold of "critical mass" for showing compliance to the regulations and social norms and avoiding pressure from regulators, society, media, and other stakeholders.

The study is not free from limitations. Being a purely quantitative investigation, it allows studies in the future to consider the qualitative aspects of the inquiry. Besides looking for potential mediations, future studies may also investigate the moderation of female directors' power or ability to influence the board's strategies and decisions. These studies may also replicate the current area of study in other developing or Asian countries to assess the possible effects of social, cultural, environmental, legal, and economic factors, if any. Furthermore, this study could not address the emerging concept of "double materiality" due to the non-availability of data. Hence, researchers may focus on the evolving ideas of "financial materiality," "impact materiality," and "socio-environment materiality," particularly after the required data become available in the future.

ORCID

Haseeb Ur Rahman https://orcid.org/0000-0002-5452-2977
Muhammad Zahid https://orcid.org/0000-0001-5790-7998
Mamdouh Abdulaziz Saleh Al-Faryan https://orcid.org/0000-0003-1665-807X
Khaled Hussainey https://orcid.org/0000-0003-3641-1031

REFERENCES

Abdul Wahab, N. S., Ntim, C. G., Adnan, M. M. M., & Ling, T. W. (2018). Top management team heterogeneity, governance changes and book-tax difference. *Journal of International Accounting, Auditing and Taxation*, *32*, 30–46. https://doi.org/10.1016/j.intaccaudtax.2018.07.002

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, *94*(1), 291–309. https://doi.org/10.1016/j.jfineco.2008.10.007

Ali Gull, A., Hussain, N., Akbar Khan, S., Nadeem, M., & Mansour Zalata, A. (2022). Walking the talk? A corporate governance perspective on corporate social responsibility decoupling. *British Journal of Management*, 1–26. https://doi.org/10.1111/1467-8551.12695

Al-Najjar, B., & Salama, A. (2022). Mind the gap: Are female directors and executives more sensitive to the environment in high-tech US firms? *Technological Forecasting and Social Change*, *184*, 122024. https://doi.org/10.1016/j.techfore.2022.122024

Amorelli, M.-F., & García-Sánchez, I.-M. (2020). Critical mass of female directors, human capital, and stakeholder engagement by corporate social reporting. *Corporate Social Responsibility and Environmental Management*, *27*(1), 204–221.

Amran, A., & Haniffa, R. (2011). Evidence in development of sustainability reporting: A case of a developing country. *Business Strategy and the Environment*, *20*(3), 141–156. https://doi.org/10.1002/bse.672

Appuhami, R., & Tashakor, S. (2017). The impact of audit committee characteristics on CSR disclosure: An analysis of Australian firms. *Australian Accounting Review*, *27*(4), 400–420. https://doi.org/10.1111/auar.12170

Arun, T. G., Almahrog, Y. E., & Aribi, Z. A. (2015). Female directors and earnings management: Evidence from UK companies. *International Review of Financial Analysis*, *39*, 137–146. https://doi.org/10.1016/j.irfa.2015.03.002

Aspen Institute. (2008). Where will they lead? MBA student attitudes about business and society. The Aspen Institute Center for Business

Education. http://www.aspeninstitute.org/sites/default/files/content/docs/bsp/SAS_PRINT_FINAL.PDF

Beck, N., & Katz, J. N. (1995). What to do (and not to do) with time-series cross-section data. *The American Political Science Review*, *89*(3), 634–647. https://doi.org/10.2307/2082979

Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review*, *18*(1), 396–414. https://doi.org/10.1111/j.1467-8683.2010.00809.x

Clark, K. D., & Maggitti, P. G. (2012). TMT potency and strategic decision-making in high technology firms. *Journal of Management Studies*, *49*(7), 1168–1193. https://doi.org/10.1111/j.1467-6486.2012.01060.x

Cumming, D., Leung, T. Y., & Rui, O. (2015). Gender diversity and securities fraud. *Academy Of Management Journal*, *58*, 1572–1593. https://doi.org/10.5465/amj.2013.0750

De Masi, S., Słomka-Gołębiowska, A., Becagli, C., & Paci, A. (2021). Toward sustainable corporate behavior: The efect of the critical mass of female directors on environmental, social, and governance disclosure. *Business Strategy and the Environment*, *30*(4), 1865–1878. https://doi.org/10.1002/bse.2721

Eagly, A. H., Mary, C., Schmidt, J., & Van Engen, M. L. (2003). Transformational, transactional, and laissez-faire leadership styles: A meta-analysis comparing women and men. *Psychological Bulletin*, *129*(4), 569–591. https://doi.org/10.1037/0033-2909.129.4.569

Elmagrhi, M. H., Ntim, C. G., Elamer, A. A., & Zhang, Q. (2019). A study of environmental policies and regulations, governance structures, and environmental performance: The role of female directors. *Business Strategy and the Environment*, *28*(1), 206–220. https://doi.org/10.1002/bse.2250

Fama, E., & Jensen, M. C. (1983). Separation of ownership and control. *Journal of Law and Economics*, *26*(1), 1–32.

Fan, Y., Jiang, Y., Zhang, X., & Zhou, Y. (2019). Women on boards and bank earnings management: From zero to hero. *Journal of Banking and Finance*, *107*, 105607. https://doi.org/10.1016/j.jbankfin.2019.105607

Freeman, R. (1984). A stakeholder approach to strategic management. Darden Graduate School of Business Administration University of Virginia Working Paper No. *01-02* (Issue January). https://doi.org/10.2139/ssrn.263511

Freeman, R. (2004). The stakeholder approach revisited.

Galbreath, J. (2018). Do boards of directors influence corporate sustainable development? An attention-based analysis. *Business Strategy and the Environment*, *27*(6), 742–756. https://doi.org/10.1002/bse.2028

Gallhofer, S. (1998). The silences of mainstream feminist accounting research. *Critical Perspectives on Accounting*, *9*, 355–375. https://doi.org/10.1006/cpac.1997.0191

García-Sánchez, I. M., Gallego-Álvarez, I., & Zafra-Gómez, J. L. (2020). Do independent, female and specialist directors promote eco-innovation and eco-design in agri-food firms? *Business Strategy and the Environment*, *30*(2), 1136–1152. https://doi.org/10.1002/bse.2676

Giannarakis, G. (2014). Corporate governance and financial characteristic effects on the extent of corporate social responsibility disclosure. *Social Responsibility Journal.*, *10*, 569–590. https://doi.org/10.1108/SRJ-02-2013-0008

Gong, M., Zhang, Z., Jia, M., & Walls, J. L. (2021). Does having a critical mass of women on the board result in more corporate environmental actions? Evidence from China. *Group & Organization Management*, *46*(6), 1106–1144. https://doi.org/10.1177/1059601121998892

Gull, A. A., Nekhili, M., Nagati, H., & Chtioui, T. (2018). Beyond gender diversity: How specific attributes of female directors affect earnings management. *The British Accounting Review*, *50*, 255–274. https://doi.org/10.1016/j.bar.2017.09.001

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *The Academy of Management Review*, *9*(2), 1–15. https://doi.org/10.2307/258434

Handajani, L., Subroto, B., Sutrisno, T., & Saraswati, E. (2014). Does board diversity matter on corporate social disclosure? An Indonesian evidence. *Journal of Economics and Sustainable Development*, *5*(9), 8–16.

Hasan, A., Hussainey, K., & Aly, D. (2022). Determinants of sustainability reporting decision: Evidence from Pakistan. *Journal of Sustainable Finance and Investment*, *12*(1), 214–237. https://doi.org/10.1080/20430795.2021.1964813

Hongming, X., Ahmed, B., Hussain, A., Rehman, A., Ullah, I., & Khan, F. U. (2020). Sustainability reporting and firm performance: The demonstration of Pakistani firms. *SAGE Open*, *10*(3), 21582440209. https://doi.org/10.1177/2158244020953180

Issa, A., Zaid, M. A. A., & Hanaysha, J. R. (2022). Exploring the relationship between female director's profile and sustainability performance: Evidence from the Middle East. *Managerial and Decision Economics*, *43*(6), 1980–2002. https://doi.org/10.1002/mde.3503

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Jin, R., Jiang, X., & Hu, H. W. (2021). Internal and external CSR in China: How do women independent directors matter? *Asia Pacific Journal of Management*, *28*, 169–204. https://doi.org/10.1007/s10490-021-09783-9

Kanter, R. M. (1979). Power failure in management circuit. *Harvard Business Review*, *57*(4), 65–75.

Katmon, N., Mohamad, Z. Z., Norwani, N. M., & Farooque, O. A. (2019). Comprehensive board diversity and quality of corporate social responsibility disclosure: Evidence from an emerging market. *Journal of Business Ethics*, *157*, 447–481. https://doi.org/10.1007/s10551-017-3672-6

Khan, M. H. U. Z. (2010). The effect of corporate governance elements on corporate social responsibility (CSR) reporting: Empirical evidence from private commercial banks of Bangladesh. *International Journal of Law and Management*, *52*, 82–109. https://doi.org/10.1108/17542431011029406

Konrad, A., Kramer, V., & Erkut, S. (2008). The impact of three or more women on corporate board. *Organizational Dynamics*, *37*(2), 145–164. https://doi.org/10.1016/j.orgdyn.2008.02.005

Low, D. C. M., Roberts, H., & Whiting, H. R. (2015). Board gender diversity and firm performance: Empirical evidence from Hong Kong, South Korea, Malaysia and Singapore. *Pacific-Basin Finance Journal*, *35*, 381–401. https://doi.org/10.1016/j.pacfin.2015.02.008

Mahmood, Z., Kouser, R., & Masud, M. A. K. (2019). An emerging economy perspective on corporate sustainability reporting – Main actors' views on the current state of affairs in Pakistan. *Asian Journal of Sustainability and Social Responsibility*, *4*(1), 8. https://doi.org/10.1186/s41180-019-0027-5

Mirza, M. (2017). Sustainability reporting: The evolving landscape in Pakistan. The Association of Chartered Certified Accountants.

Molinero-Díez, P., Blanco-Mazagatos, V., Garcia-Rodriguez, I., & Romero-Merino, M. E. (2022). Women directors, educational background and firm value of Spanish listed companies. *Gender in Management*, *37*(7), 816–835. https://doi.org/10.1108/GM-07-2020-0221

Muttakin, M. B., Chatterjee, B., Khan, A., Dessalegn Getie Mihret, R. R., & Yaftian, A. (2022). Corporate political donations, board gender diversity, and corporate social responsibility: Evidence from Australia. *Journal of Business Research*, *152*, 290–299. https://doi.org/10.1016/j.jbusres.2022.07.062

Nadeem, M. (2020). Does board gender diversity influence voluntary disclosure of intellectual capital in initial public offering prospectuses? Evidence from China. *Corporate Governance: An International Review*, *28*(1), 100–118. https://doi.org/10.1111/corg.12304

Nekhili, M., & Gatfaoui, H. (2012). Are demographic attributes and firm characteristics drivers of gender diversity? Investigating women's positions on french boards of directors. *Journal of Business Ethics*, *118*(2), 227–249. https://doi.org/10.1007/s10551-012-1576-z

Nguyen, H., Ntim, G., & Malagila, J. (2020). Women on corporate boards and financial and non-financial performance: A systematic literature review and future research agenda. *International Review of Financial Anaylsis*, *71*, 101554. https://doi.org/10.1016/j.irfa.2020.101554

Nugraheni, P., Alhabshi, S. M., & Rosman, R. (2022). The influence of audit committee characteristics on the ethical disclosure of sharia compliant companies. *Cogent Business & Management*, *9*(1), 2115220. https://doi.org/10.1080/23311975.2022.2115220

Oino, I., & Liu, J. (2022). Do female board members influence corporate social responsibility performance? *IIM Kozhikode Society & Management Review*, *11*(2), 195–206. https://doi.org/10.1177/22779752211073643

Owen, A. L., & Temesvary, J. (2018). The performance effects of gender diversity on bank boards. *Journal of Banking and Finance*, *90*(C), 50–63. https://doi.org/10.1016/j.jbankfin.2018.02.015

Pakistan Stock Exchange. (2019). Companies listing status. Retrieved June 23, 2023, from https://dps.psx.com.pk/listings

Pitenoei, Y. R., Gerayli, M. S., & Khozein, A. (2022). Audit committee and CSR disclosure: Does the gender diversity of audit committee members matter? *Gender in Management: An International Journal*, *37*(7), 875–890. https://doi.org/10.1108/GM-03-2021-0055

Post, C., Rahman, N., & Rubow, E. (2011). Green governance: Boards of directors' composition and environmental corporate social responsibility. *Business and Society*, *50*(1), 189–223. https://doi.org/10.1177/0007650310394642

Prabowo, M. A., Jamin, M., & Saputro, D. J. (2017). Female executive officers and corporate social responsibility disclosure: Evidence from the banking industry in an emerging market. *Journal Global Business Advancement*, *10*(6), 631–651. https://doi.org/10.1504/JGBA.2017.091944

Pucheta-Martínez, M. C., Bel-Oms, I., & Gallego-Álvarez, I. (2023). Corporate social responsibility commitment of women directors through audit committees: Evidence from international firms. *Academia Revista Latinoamericana de Administración*, *36*(1), 98–118. https://doi.org/10.1108/ARLA-07-2022-0139

Pucheta-Martínez, M. C., Bel-Oms, I., & Olcina-Sempere, G. (2019). Commitment of independent and institutional women directors to corporate social responsibility reporting. *Business Ethics: A European Review*, 28(3), 290–304.

Pucheta-Martínez, M. C., Gallego-Álvarez, I., & Bel-Oms, I. (2021). Corporate social and environmental disclosure as a sustainable development tool provided by board sub-committees: Do women directors play a relevant moderating role? *Business Strategy and the Environment*, *30*(8), 3485–3501.

Rahman, H., & Zahid, M. (2021). Women directors and corporate performance: Firm size and board monitoring as the least focused factors. *Gender in Management: An International Journal*, *36*(5), 1–29. https://doi.org/10.1108/GM-12-2019-0252

Rahman, H., Zahid, M., & Al-faryan, M. (2023). ESG and firm performance: The rarely explored moderation of sustainability strategy and top management commitment. *Journal of Cleaner Production*, *404*, 136859. https://doi.org/10.1016/j.jclepro.2023.136859

Rahman, H. U., Khan, S., & Zahid, M. (2021). Do directors' compensation, education and experience affect firm financial performance? An evidence from the textile industry of Pakistan. *Journal of Managerial Sciences*, *15*(1), 101–114.

Rahman, H. U., Zahid, M., & Al-Faryan, M. A. S. (2022). Boardroom gender diversity and firm performance: From the lens of voluntary regulations, "tokenism" and "critical mass". *Total Quality Management & Business Excellence*, 1–19. https://doi.org/10.1080/14783363.2022.2056439

Rahman, H. U., Zahid, M., & Khan, M. (2021). Corporate sustainability practices: A new perspective of linking board with firm performance. *Total Quality Management & Business Excellence*, *0*(0), 1–18. https://doi.org/10.1080/14783363.2021.1908826

Rahman, H. U., Zahid, M., & Muhammad, A. (2022). Connecting integrated management system with corporate sustainability and firm performance: From the Malaysian real estate and construction industry perspective. *Environment, Development and Sustainability*, *24*(2), 2387–2411. https://doi.org/10.1007/s10668-021-01538-2

Rahman, H. U., Zahid, M., & Naveed. (2018). Does the 'business case' for academic directors on corporate board stand up? *Journal of Managerial Sciences*, *XII*(3), 190–202.

Saigal, R. (2020). Gender diversity in the Pakistani corporate boardroom. Available at https://blogs.law.ox.ac.uk/business-law-blog/blog/2020/07/gender-diversity-pakistani-corporate-boardroom

Saleh, M., Zulkifli, N., & Muhamad, R. (2010). Corporate social responsibility disclosure and its relation on institutional ownership: Evidence from public listed companies in Malaysia. *Managerial Auditing Journal*, *25*(6), 591–613. https://doi.org/10.1108/02686901011054881

Shaheen, R., Yang, H., Bhutto, M., Bala, H., & Khan, F. (2021). Assessing the effect of board gender diversity on CSR reporting through moderating role of political connections in Chinese listed firms. *Frontiers in Pshycology*, *31*(12), 796470. https://doi.org/10.3389/fpsyg.2021.796470

Slovin, E. (1960). Slovin's formula for sampling technique. Statistics How To. Retrieved from: https://www.statisticshowto.com/how-to-use-slovins-formula/

Terjesen, S., Sealy, R., & Singh, V. (2009). Women directors on corporate boards: A review and research agenda. *Corporate Governance: An International Review*, *17*(3), 320–337. https://doi.org/10.1111/j.1467-8683.2009.00742.x

Torchia, M., Calabrò, A., & Huse, M. (2011). Women directors on corporate boards: From tokenism to critical mass. *Journal of Business Ethics*, *102*(2), 299–317. https://doi.org/10.1007/s10551-011-0815-z

Wang, J., & Sun, J. (2022). The role of audit committees in social responsibility and environmental disclosures: Evidence from Chinese energy sector. *International Journal of Diclosure and Governance*, *19*, 113–128. https://doi.org/10.1057/s41310-021-00131-3

Wang, Y., & Clift, B. (2009). Is there a "business case" for board diversity? *Pacific Accounting Review*, *21*(2), 88–103. https://doi.org/10.1108/01140580911002044

Wooldridge, J. M. (2013). *Introductory econometrics: A modern approach* (5th ed.). South-Western Cengage Learning.

Yang, W., Yang, J., & Gao, Z. (2019). Do female board directors promote corporate social responsibility? An empirical study based on the critical mass theory. *Emerging Markets Finance & Trade*, *55*, 1–20. https://doi.org/10.1080/1540496X.2019.1657402

Yusoff, W. F. W. (2010). Characteristics of boards of directors and board effectiveness: A study of Malaysian public listed companies. PhD thesis. Victoria University, Melbourne.

Zahid, M., Rahman, H. U., Ali, W., Khan, M., Alharthi, M., Qureshi, M. I., & Jan, A. (2020). Boardroom gender diversity: Implications for corporate sustainability disclosures in Malaysia. *Journal of Cleaner Production*, *244*, 118683. https://doi.org/10.1016/j.jclepro.2019.118683

Zahid, M., Rahman, H. U., Khan, M., Ali, W., & Shad, F. (2020). Addressing endogeneity by proposing novel instrumental variables in the nexus of sustainability reporting and firm financial performance: A step-by-step procedure for non-experts. *Business Strategy and the Environment*, *29*(8), 3086–3103. https://doi.org/10.1002/bse.2559

Zahid, M., Rahman, H. U., Muneer, S., Butt, B. Z., Isah-Chikaji, A., & Memon, M. A. (2019). Nexus between government initiatives, integrated strategies, internal factors and corporate sustainability practices in Malaysia. *Journal of Cleaner Production*, *241*, 118329. https://doi.org/10.1016/j.jclepro.2019.118329

Zahid, M., Rehman, H. U., & Khan, M. A. (2018). ESG in focus: The Malaysian evidence. *City University Research Journal*, *09*(1), 72–84.

Zaichkowsky, J. L. (2014). Women in the board room: One can make a difference. *International Journal of Business Governance and Ethics*, *9*(1), 91–113. https://doi.org/10.1504/IJBGE.2014.062774

Zalata, A. M., Ntim, C. G., Alsohagy, M. H., & Malagila, J. (2022). Gender diversity and earnings management: The case of female directors with financial background. *Review of Quantitative Finance and Accounting*, *58*(1), 101–136. https://doi.org/10.1007/s11156-021-00991-4

Zhai, H. Y., & Gao, J. (2015). Research on the influence of female executives' characteristics on corporate social responsibility performance: Empirical evidence from listed companies in China. *Communication of Finance and Accounting*, *15*, 58–63.

Zhang, J. Q., Zhu, H., & Ding, H. (2013). Board composition and corporate social responsibility: An empirical investigation in the post Sarbanes-Oxley era. *Journal of Business Ethics*, *114*(3), 381–392. https://doi.org/10.1007/s10551-012-1352-0

Zhu, N., & Zhang, Y. (2022). The impact of management's characteristics on corporate environmental responsibility performance of energy systems in the digital age—Evidence from China's traditional energy listed companies industry. *Energy Reports*, *8*, 8821–8829. https://doi.org/10.1016/j.egyr.2022.06.073

How to cite this article: Rahman, H. U., Zahid, M., Jan, A., Al-Faryan, M. A. S., & Hussainey, K. (2023). Is it the mere female directors or their attributes that matter for the quality of corporate sustainability disclosures? *Business Strategy and the Environment*, 1–18. https://doi.org/10.1002/bse.3501