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Board Gender Diversity and Corporate Social Responsibility. A Literature Review on Critical Mass Theory and Research Recommendations

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Correspondence: Patrick Velte (patrick.velte@leuphana.de)**Received:** 13 May 2025 | **Revised:** 24 June 2025 | **Accepted:** 1 July 2025**Keywords:** board gender diversity | board systems | corporate governance | critical mass theory | CSR performance | CSR reporting

ABSTRACT

This study addresses the question of whether a critical mass of female directors positively contributes to corporate social responsibility (CSR) outcomes. Based on stakeholder-agency and critical mass theories, a structured literature review of 92 archival critical mass studies on the impact of board gender diversity (BGD) on CSR performance and reporting was conducted. Separating absolute and relative measures of critical mass, country-specific studies were also grouped according to board structures and board gender quotas of respective regimes. The review indicates a positive impact of at least three female directors on CSR outcomes. This relates to cross-country studies as well as to countries with a one-tier system. Interestingly, the positive relationship between at least three women on boards and CSR relates to countries with voluntary and mandatory board gender quotas. To the best of our knowledge, this paper presents the first literature review with a focus on critical mass theory in BGD and CSR, as it structures the main variables that have been recognized in prior studies, stresses key research gaps, and presents major recommendations for future research. Among others, future studies should address potential moderators and recognize interactions with other board characteristics. The study is also highly relevant for regulatory bodies and business practice to recognize a critical mass of female directors for listed companies.

1 | Introduction

Boards of directors of public interest entities (PIEs) play a prominent role in corporate sustainability transformation processes, leading to increased levels of corporate social responsibility (CSR) reporting and performance (Khatri 2023; Post et al. 2011). In view of the complexity of board effectiveness, board gender diversity (BGD) has become one of the most important attributes of sustainable corporate governance (Eliwa et al. 2023; Caby et al. 2024). Researchers have stressed that an increased level of female directors positively impacts CSR outcomes, highlighting women's roles in promoting sustainable board behavior and reducing stakeholder-agency conflicts (e.g., Garcia-Sanchez

et al. 2024; Amorelli and Garcia-Sanchez 2020). However, as the majority of studies relied on the ratio of female directors, heterogeneous results on insignificant or even negative impacts of BGD on CSR outcomes are present (e.g., Gallego-Sosa et al. 2024; Garcia-Sanchez et al. 2025). In recent years, an increased number of studies included the critical mass theory (Kanter 1977) and analyzed the impact of a critical mass of females on boards (e.g., at least three women) on CSR outcomes (Rahman et al. 2024; Liu et al. 2023). Increased stakeholder pressure and regulatory initiatives to implement mandatory board gender quotas are the major catalysts for this increased research awareness. In view of the heterogeneous use of critical mass and CSR variables, a comparative analysis of these research results

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is necessary to support business practice, regulatory bodies, and researchers alike.

Meta-analyses (e.g., Alfi et al. 2025; AlJanadi 2025) and literature reviews (e.g., Banno et al. 2023; Fernandez-Torres et al. 2025) on the link between BGD and CSR outcomes have increased in recent years. Some papers have totally neglected the impact of critical mass theory on the relationship between BGD and CSR (e.g., Alfi et al. 2025; AlJanadi 2025; Byron and Post 2016). Others have just mentioned the inclusion of critical mass theory in prior studies without analyzing their impact on CSR as a comparative analysis of empirical results (Banno et al. 2023; Campopiano et al. 2023; Fernandez-Torres et al. 2025; Velte 2017; Wu et al. 2022). Few literature reviews included selective studies on critical mass theory as a side remark without structuring and analyzing the various BGD and CSR variables (Amorelli and Garcia-Sanchez 2021; Nguyen et al. 2020). In comparison to prior studies, we do not identify any literature review on the restriction on the critical mass of female board members and its contribution to CSR outcomes. Due to the heterogeneity of critical mass and CSR variables in prior studies, a focus on critical mass theory (Kanter 1977) is needed to analyze in more detail under which circumstances female directors on boards may positively contribute to CSR (Velte 2024a). Moreover, as many national regulations have explicitly included a mandatory threshold of female directors as a critical mass, calls for empirical evidence on the impact of these regulations are mounting from an international perspective (Bullay et al. 2022). Addressing this research gap, our study focuses on studies that include various absolute and relative measures of a critical mass of female board members. CSR outcomes are differentiated into CSR performance and reporting in line with prior studies (Velte 2023a). Country-specific studies are further divided into their board structures (one-tier system, two-tier system, and voting between both systems) and regulations on board gender quotas. Building upon stakeholder-agency (Hill and Jones 1992) and critical mass theories (Kanter 1977), we assume that a critical mass of female directors increases the level of CSR performance and reporting. While this relationship should be valid in all board structures, stakeholders should reward a voluntary inclusion of a critical mass more than reaching compliance with the law.

Our study mainly contributes to prior meta-analyses and literature reviews by explicitly addressing the following research questions:

- Which absolute and relative measures of a critical mass of BDG have a significant positive impact on CSR performance and reporting?
- Is the assumed positive relationship between a critical mass of female directors and CSR outcomes dependent on specific board structures and regulations on board gender quotas in country-specific settings?

To ensure comparability and validity, we limit our review to studies on the board level and on CSR outcomes, stressing the need of a critical mass of females to promote corporate sustainability transformation. Our literature review indicates that the majority of studies have focused on absolute measures of critical mass and CSR performance. We also stress a high attraction of conducting country-specific studies, based

on regimes with a one-tier system and voluntary board gender quotas. In line with critical mass theory (Kanter 1977), a critical mass of female directors, such as three women, positively contributes to CSR outcomes in cross-country and country-specific settings. While prior research mainly supported this link in one-tier systems, such as the USA, positive relationships between BGD and CSR remain for regimes with voluntary and mandatory board gender quotas. Moreover, we highlight major research gaps and present useful research recommendations. Among others, future research should include relative measures of critical mass based on the categories of Kanter (1977), connect a critical mass of BGD with other diversity characteristics, rely on CSR reporting quality and related subpillars, and recognize firm- and country-specific moderators.

Our analysis is structured as follows: Section 2 presents the theoretical foundation of the study, which is based on stakeholder-agency (Hill and Jones 1992) and critical mass theories (Kanter 1977). Section 3 includes the research framework and the methodology. Section 4 is the content analysis of the studies and the sample selection process. Section 5 refers to the major results of the literature review, differentiating between cross-country and country-specific studies. Results of country-specific studies are further separated into board structure and regulations on board gender quotas. The major limitations of prior studies and research recommendations are stressed in Section 6, based on critical mass variables, CSR proxies, and moderator variables. Section 7 gives a summary of the study.

2 | Critical Mass and Stakeholder-Agency Theories

The impact of BGD on CSR outcomes can be explained through multiple theories, such as stakeholder, legitimacy, and resource-dependence theories (Banno et al. 2023). We relied on critical mass (Kanter 1977) and stakeholder-agency theories (Hill and Jones 1992) in line with prior studies (Banno et al. 2023) and assume a complementary relationship between these theories. However, we stress the connectivity of other management theories (legitimacy and resource dependence theories) because the inclusion of female directors represents a major instrument to gain stakeholder legitimacy and a key resource for the long-term survival of the firm. Prior research found inconclusive results on the impact of female directors on CSR, based on their numbers and ratios (e.g., Furtuna and Sönmez 2024; Yadav and Prashar 2023). It is thus questionable whether a certain level as a critical mass of BGD must be achieved before improving CSR efforts significantly. Kanter (1977) constructed four categories of groups according to their composition: uniform, skewed, tilted, and balanced groups. Based on our research question, uniform groups are those with no female directors on the board. Skewed groups include up to 20% of “token women” Tilted groups represent male-dominated boards of directors with a maximum of 40% of females. Finally, balanced groups refer to those with 40%–60% of female directors.

In line with stakeholder-agency theory (Hill and Jones 1992), stakeholders increasingly demand the appropriate consideration of gender diversity at the board level (stakeholder

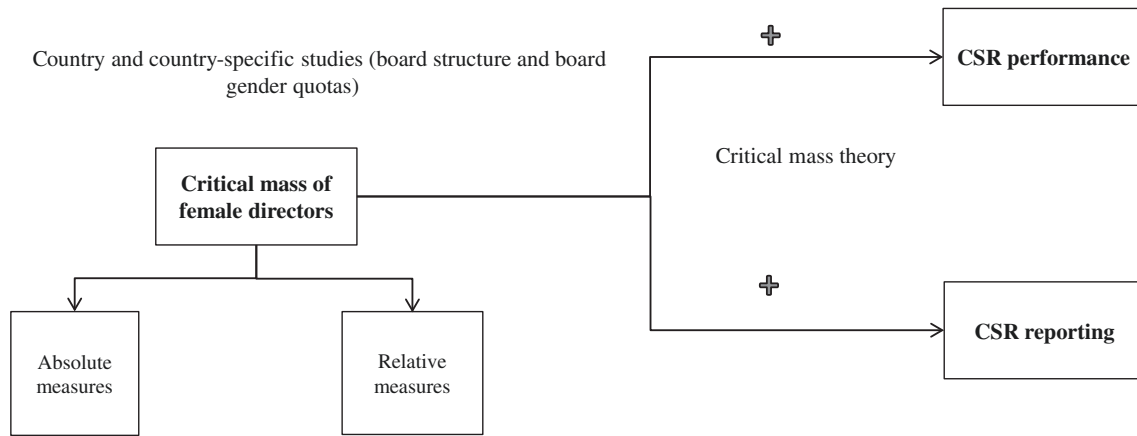


FIGURE 1 | Research framework on the impact of critical mass of female directors on CSR performance and reporting.

pressure), since BGD significantly reduces agency conflicts. Gender diversity on boards is a critical feature of management staffing and should improve monitoring quality for the benefit of all stakeholders (Eliwa et al. 2023). Women in board positions tend to be more independent than their male colleagues, in view of the “old boys network”, and can be classified as outsiders (Sultana et al. 2024). Moreover, female directors are assumed to be more active in CSR issues and can more easily assert stakeholder interests for successful corporate sustainability transformation (Hassan et al. 2024; Haque et al. 2024). This can lead to competitive advantages, which promote the level of CSR reporting and performance (e.g., through a better reputation) and, ultimately, stakeholder reputation (Nuber and Velte 2021). While stakeholder agency theory assumes that BGD and CSR are positively related (Hill and Jones 1992), a critical mass of female directors is needed. Skewed boards are connected with “tokenism” (Kanter 1977) and this may even promote agency conflicts between managers and stakeholders. Token women do not have adequate influence and motivation to pressure top managers for increased CSR efforts due to prevention strategies by their dominant male colleagues (Nuber and Velte 2021). There is a high probability that the inclusion of token women in boards will lead to symbolic use of CSR and greenwashing behavior. Firms may signal to their stakeholders with the board selection of a few women that they integrate their CSR demands in their strategies and processes. However, a substantive improvement of this strategy on sustainability transformation will not be achieved because token women cannot change CSR management strategies. In tilted or balanced boards, the interaction between female and male attributes promotes active discussions on CSR strategies and should increase CSR outcomes (Gull, Hussain, et al. 2023). The influence of female directors should be high enough to convince their male colleagues in increased CSR efforts. This should lead to increased quality of CSR reporting, higher amounts of CSR performance, and extended use of CSR assurance. A higher quality of CSR reporting, increased CSR performance and CSR assurance mitigate agency conflicts because stakeholders are dependent on objective CSR information. Information asymmetries and conflicts of interest between managers and stakeholders will be lower as a consequence.

3 | Research Framework and Methods

Our literature review is based on a research framework which structures the major critical mass and CSR variables. A critical mass of female board members as the independent variable in this review was divided into absolute and relative measures. Absolute measures refer to a minimum number of female directors greater than one (e.g., at least two, three, or four women). Relative measures are linked to a minimum ratio of women in the board, for example, at least 30% females.

CSR as the dependent variable in this literature review is structured in CSR performance and reporting in line with prior studies (e.g., Velte 2023a). CSR performance mainly refers to external databases, individual environmental and social scores, and specific subpillars (e.g., carbon performance). CSR reporting includes environmental and social information as an external communication tool for a wide range of stakeholders. Depending on the specific sample and regime, CSR reporting can be voluntary or mandatory. In view of the heterogeneous board structures from an international perspective, country-specific studies are divided into regimes with a one-tier system, two-tier system, and a voting right between both systems. We assume that a critical mass of females positively contributes to CSR in all categories of board structure. Moreover, we recognized whether studies were conducted in countries with mandatory or voluntary board gender quotas. We assume that the positive effect of BGD on CSR is higher in countries with voluntary gender quotas in comparison with mandatory recognition of a critical mass of females. In line with stakeholder agency theory (Hill and Jones 1992), stakeholders should reward a voluntary recognition of a critical mass of BGD more than compliance with legal quotas.

Figure 1 summarizes the research framework.

4 | Content Analysis

Prior research on the impact of a critical mass of females on CSR refers to different theories, models, and variables (e.g., Oyewo et al. 2025; Sultana et al. 2024), stressing the need for

a specific literature review on this topic. The main goal of a literature review is to guide researchers within this research topic (Torraco 2005; Webster and Watson 2002) by summarizing major research results and stressing recommendations for future research. Moreover, a literature review supports business practices by stressing the need for organizational changes of board composition, such as the inclusion of a critical mass of female board members. In contrast to meta-analyses (e.g., Alfi et al. 2025), our goal is not to test possible moderator or mediator variables from an econometric view. Instead, we conduct a comparative analysis of the impact of a critical mass of BGD on CSR outcomes by differentiating between heterogeneous proxies. Gender and CSR variables included in this review are too heterogeneous for a meta-analysis, which requires a more homogeneous setting.

Our literature review is based on established processes (Denyer and Tranfield 2009). First, we articulated our research objective. In contrast to prior studies on BGD and CSR, we present the first literature review on the impact of a critical mass of female directors on CSR performance and reporting. Second, based on international databases (EBSCO Business Source Complete and Web of Science), we included relevant keywords for the selection of relevant studies “board gender diversity”, “gender diversity”, “female directors”, “women on boards”, in connection with “critical mass” and “ESG performance”, “ESG reporting”, “CSR reporting”, “CSR performance”, “CSR disclosure”, and related subpillars (“social reporting”, “social performance”, “environmental reporting”, “environmental performance”) and terms. This led to an initial sample after use of keywords of 323 studies. Third, we created relevant exclusion and inclusion criteria for the literature review. As our goal is to rely on the statistical relationship between a critical mass of females and CSR and to guarantee an appropriate level of comparability, we focused on archival studies in the literature review as the dominant research method. The focus on archival research is helpful to verify under which circumstances a critical mass of female directors is positively related to CSR outcomes. Analyses on the separation between CSR performance and reporting as CSR outcomes and between absolute and relative measures of a critical mass of female directors are focused on empirical-quantitative designs. We deleted 29 non-empirical (analytical, conceptual) and qualitative papers. However, non-archival research was included in the non-review sections of this paper (e.g., in the theoretical foundation and recommendations sections). Many studies on the link between BGD and CSR did not recognize the critical mass theory (Kanter 1977). Instead, these studies focused on the existence, the ratio or number of females or the Blau index. We deleted 153 studies with no inclusion of a critical mass variable in the regression analyses. While we did not set a temporal limit due to the relatively short time frame of empirical research, we only included studies published in double-blind scientific journals in English language. Consequently, we deleted 49 and stress a final sample of 92 studies. Figure 2 presents the selection process for the included studies of the literature review.

Fourth, we coded the studies in line with our main categories of critical mass variables (relative/absolute) and CSR outcomes (performance/reporting). Moreover, country-specific

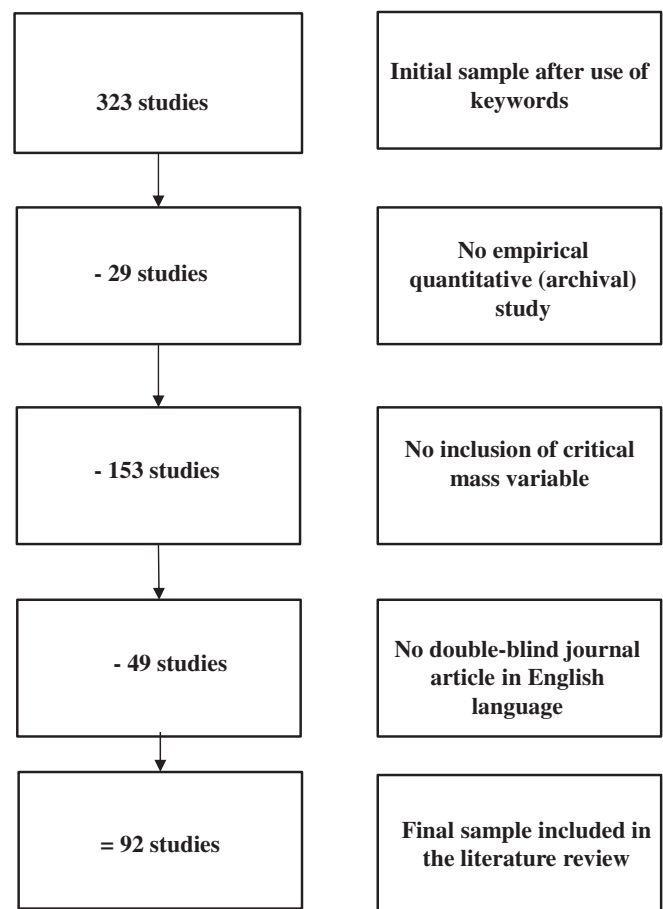


FIGURE 2 | Flow diagram of the sample selection process.

studies were further differentiated by board structure (one-tier versus two-tier system and voting right) and mandatory/voluntary board gender quotas. Based on vote-counting (Light and Smith 1971), significant positive (+), negative (−), and insignificant results (+/−) were included. Table 1 structures the studies by the year of publication (Panel A), region (Panel B), journal (C), CSR variables (Panel D), and critical mass variables (Panel E). Studies on the relationship between a critical mass of females and CSR started in 2011 and increased significantly in 2023 (18 studies) and 2024 (24 studies) (Panel A). Most researchers conducted analyses in specific countries (56 studies) in comparison to cross-country designs (36 studies) (Panel B). We grouped all country-specific studies by board structure and regulations on board gender quotas. Most studies addressed countries with a one-tier system (37 studies) in comparison to regimes with a two-tier system (11 studies) and a voting right between both systems (8 studies). Within regimes with a one-tier system, the USA is prominent in our literature review (18 studies). Moreover, the majority of included studies relied on countries with a voluntary inclusion of female directors in boards (38 studies), such as the USA (18 studies), in comparison with mandatory board gender quotas (18 studies). Interestingly, national regulations on mandatory board gender quotas explicitly referred to critical mass theory, as a specific quorum of female directors was implemented for specific PIEs. Unfortunately, the minimum percentage of female directors is heterogeneous and ranges from 20% to 40% in various regimes. While the majority of board regulations

TABLE 1 | Count of cited published papers.

Panel A: by publication year

Total: 92

- 2025: 13
- 2024: 24
- 2023: 18
- 2022: 9
- 2021: 7
- 2020: 4
- 2019: 5
- 2018: 5
- 2017: 2
- 2015: 1
- 2014: 1
- 2013: 2
- 2011: 1

Panel B: by region

Total: 92

- Cross-Country: 36
- Corporate governance systems in country-specific studies (56):
 - One-tier system (37): Australia (2), Bangladesh (1), Brazil (1), Canada (1), India (5), New Zealand (1), Pakistan (1), Palestine (1), Spain (2), Taiwan (1), Turkey (1), UK (2), USA (18)
 - Two-tier system (11): China (9), Germany (1), Indonesia (1)
 - Voting right (8): France (2), Italy (6)
- Board gender quotas in country-specific studies (56):
 - Mandatory (18): France (2), Germany (1), India (5), Italy (6), Pakistan (1), Spain (2), Taiwan (1)
 - Voluntary (38): Australia (2), Bangladesh (1), Brazil (1), Canada (1), China (9), Indonesia (1), New Zealand (1), Palestine (1), Turkey (1), UK (2), USA (18)

(Continues)

Panel C: by journal

Total: 92

- *Accounting, Finance & Corporate Governance Journals (28):*
 - *Accounting & Finance: 2*
 - *Accounting Forum: 1*
 - *Applied Economics: 1*
 - *China Accounting and Finance Review: 1*
 - *Corporate Governance: 4*
 - *Emerging Markets Finance and Trade: 1*
 - *Finance Research Letters: 1*
 - *International Journal of Accounting & Information Management: 1*
 - *International Journal of Disclosure and Governance: 1*
 - *International Journal of Finance & Economics: 2*
 - *International Review of Economics and Finance: 1*
 - *International Review of Financial Analysis: 1*
 - *Journal of Accounting Literature: 2*
 - *Journal of Applied Accounting Research: 2*
 - *Journal of Corporate Finance: 3*
 - *Journal of Sustainable Finance & Investment: 1*
 - *Managerial Finance: 1*
 - *Pacific Accounting Review: 1*
 - *The British Accounting Review: 1*
- *Management & Sustainability Journals (64):*
 - *British Journal of Management: 1*
 - *Business & Society: 1*
 - *Business Ethics, the Environment & Responsibility: 1*
 - *Business Strategy and the Environment: 17*
 - *Corporate Communications: 1*
 - *Corporate Social Responsibility and Environmental Management: 10*
 - *EuroMed Journal of Business: 1*
 - *European Management Review: 1*
 - *Gender, Work & Organization: 1*
 - *Group & Organization Management: 1*
 - *Human Relations: 1*
 - *International Journal of Productivity and Performance Management: 2*
 - *International Journal of Manpower: 1*
 - *Journal of Business Ethics: 3*
 - *Journal of Business Research: 2*
 - *Journal of Cleaner Production: 2*
 - *Journal of Innovation & Knowledge: 1*

(Continues)

TABLE 1 | (Continued)

Panel C: by journal

- *Journal of Management and Governance*: 1
- *Journal of Management Control*: 1
- *Journal of Organizational Behavior*: 1
- *Journal of Product Innovation Management*: 1
- *Journal of Strategy and Management*: 1
- *Journal of the Knowledge Economy*: 1
- *Management Decision*: 2
- *Management Research Review*: 1
- *Review of Managerial Science*: 2
- *Social Responsibility Journal*: 1
- *Society and Business Review*: 1
- *Technological Forecasting & Social Change*: 2
- *The International Journal of Human Resource Management*: 1

Panel D: by CSR variable

- Total: 92
- CSR performance: 60
 - CSR reporting: 32

Panel E: by critical mass variable

- Total: 8
- Relative measures (48):
 - 1%–9%: 1
 - <10%: 1
 - At least 10%: 2
 - > 10%: 1
 - 10%–19%: 1
 - At least 15%: 1
 - < 20%: 6
 - <20% in management board: 1
 - At least 20%: 2
 - > 20%: 1
 - 20%–24%: 1
 - > 25%: 1
 - 25%–33%: 1
 - 20%–40%: 7
 - 20%–50%: 1
 - At least 30%: 4
 - At least 30% or 3: 1
 - > 30%: 3

(Continues)

Panel E: by critical mass variable

- > 33%: 1
- At least 40%: 2
- > 40%: 2
- 40%–60%: 5
- > 50%: 1
- Absolute measures (130):
 - At least 2: 41
 - At least 2 independent: 1
 - At least 3: 71
 - At least 3 independent: 1
 - At least 3 business experts: 1
 - At least 3 support specialists: 1
 - At least 3 in supervisory board: 1
 - At least 4: 9
 - At least 5: 3
 - At least 6: 1

Note: Many studies include more than one variable.

are linked to PIEs, additional requirements, such as thresholds of firm size and employees, are also common. Thus, the comparability of mandatory board gender quotas is low and this stresses the need for an international harmonization in future years.

The studies were published in various publication outlets with a focus on management & sustainability journals (64 studies) in comparison to accounting, finance, and corporate governance journals (28 studies) (Panel C). We stress an increased recognition of two sustainability journals (*Business Strategy and the Environment*: 17 studies; *Corporate Social Responsibility and Environmental Management*: 10 studies). Panel D stresses a dominant recognition of CSR performance and related subpillars as dependent variables (60 studies), while CSR reporting was included to a lower extent (32 studies). Finally, as illustrated in Panel E, the majority of studies addressed absolute measures of critical mass (130 studies) with a high representation of at least two (41 studies) and three women (71 studies). In contrast, relative measures were included to a lower extent (48 studies) and remain heterogeneous.

5 | Results of the Literature Review

5.1 | Cross-Country Studies

5.1.1 | Absolute Measures

Cross-country studies have mostly focused on absolute measures of critical mass, such as a quorum of at least three women, and CSR performance. Twenty-two studies found a positive relationship between BGD and CSR outcomes in line with critical mass theory (Kanter 1977). There are indications that a critical mass of three female directors positively contributes to overall CSR performance (Menicucci and Paolucci 2023), environmental innovation (Bazel-Shoham et al. 2023), carbon performance (Haque et al. 2024; Peng et al. 2025), carbon emissions trading (Oyewo et al. 2025) and it mitigates CSR controversies (Issa and Hanaysha 2023). Moreover, at least three women on boards increase the degree of CSR reporting (Amorelli and Garcia-Sanchez 2020; Fernandez-Feijoo et al. 2014; Shoham et al. 2018; Temiz and Acar 2023), and specific subpillars of CSR reporting (circular economy: Enciso-Anfaro and Garcia-Sanchez 2024; diversity, equality, and inclusion: Garcia-Sanchez et al. 2024, and environmental strengths: Post et al. 2011).

A few studies also stressed a positive impact of a critical mass of at least two women on sustainable and environmental investments (Muhammad and Ali 2025; Bhuiyan et al. 2021), waste management (Gull, Hussain, et al. 2023), carbon performance (Gull et al. 2025; Nuber and Velte 2021), CSR reporting (Sultana et al. 2024), and circular economy disclosure (Enciso-Anfaro and Garcia-Sanchez 2024). Moreover, at least four female directors positively contribute to environmental risk management (Hassan et al. 2024), carbon offsets and financial incentives (Oyewo et al. 2025).

We stress a low amount of eight heterogeneous results on critical mass and CSR based on cross-country designs. A critical mass of two or three women on boards is not needed to impact

CSR performance (Fernandez-Mendez et al. 2025) or climate change performance (Garcia-Sanchez et al. 2023) in a positive way. These quotas are insignificantly related to resource use reduction (Gallego-Sosa et al. 2024), environmental performance (Birindelli et al. 2019), environmental innovation (Traversi et al. 2024), and CSR decoupling (Eliwa et al. 2023).

5.1.2 | Relative Measures

While cross-country studies are relatively low in amount (13 studies) and recognized heterogeneous relative measures of critical mass, a critical mass of female directors tends to increase CSR performance and reporting in line with critical mass theory (Kanter 1977). Based on CSR performance, this relates to a critical mass of 15% (Ginglinger and Raskopf 2023), 30% (Khatri 2023; Velte 2024b), 20%–40% (Jouber 2022), more than 25% (Nerantzidis et al. 2022) and more than 30% females (Abed et al. 2025). There are also hints that CSR reporting is positively influenced by a critical mass of 20% (Enciso-Anfaro and Garcia-Sanchez 2024; circular economy), 30% (Caby et al. 2024; carbon), 20%–50% (Bullay et al. 2022), and 40%–60% females (Garcia-Sanchez et al. 2024; diversity, equality and inclusion). However, Gallego-Sosa et al. (2024) did not find any impact of at least 30%–40% females on resource use reduction. Garcia-Sanchez et al. (2025) did not indicate any positive contribution of recognizing a critical mass of females of 20%–60% on carbon reporting.

5.2 | Country-Specific Studies With a Focus on Board Structure

5.2.1 | One-Tier Systems

Country-specific studies mainly focused on one-tier systems and absolute measures of critical mass (40 studies). In line with our results on cross-country designs, there are clear indications that a critical mass of female directors positively contributes to CSR outcomes, especially CSR performance, in one-tier systems (26 studies). This corresponds to our remarks on critical mass theory (Kanter 1977). Prior studies found that a critical mass of three women increases social performance (Arayakarnkul et al. 2022; Cook and Glass 2018; Pinheiro et al. 2024; Tunyi et al. 2023), carbon performance (Toukabri and Jilani 2023), emissions performance (Kyaw et al. 2022), donations (Lin et al. 2018), and it decreases discrimination and environmental lawsuits (Abebe and Dadanlar 2021; Liu 2018). Garcia-Meca et al. (2024) stressed a positive impact of at least three female support specialists on environmental innovation, while at least two or three independent female directors lead to increased CSR expenditures (Kaur et al. 2024). There are also hints that at least three women on boards increase the level of overall CSR reporting (Cabeza-Garcia et al. 2018), social reporting (Arora et al. 2025), environmental reporting (Arora and Aliani 2023), and carbon reporting (Lemma et al. 2023).

A few studies stressed that a critical mass of two females is connected with higher levels of CSR performance (Yarram and Adapa 2021), environmental investments (Atif et al. 2020), renewable energy consumption (Atif et al. 2021),

overall CSR reporting (Hassan 2025), social reporting (Arora and Singh 2024) and carbon reporting (Ben-Amar et al. 2017; Hollindale et al. 2019). Furthermore, at least four female directors are positively related to CSR performance (Zharfpeykan and Bai 2025) and modern slavery reporting (Moussa et al. 2023).

Fourteen studies in this literature review did not find any indications for a critical mass. Relying on CSR performance, studies recognized at least two (Boulouta 2013), three (Au et al. 2023; Cordeiro et al. 2020), two or three (Konadu et al. 2022), and two, three, or four females (Bose et al. 2022). A few insignificant results also occurred for CSR reporting and a critical mass of two or three female directors (Manita et al. 2018; Rahman et al. 2024; Furtuna and Sönmez 2024; Yadav and Prashar 2023).

Research on the impact of relative measures of critical mass on CSR in one-tier systems is very low (4 studies). CSR performance is strengthened by a critical mass of 10%–40% (Al-Shaer et al. 2024) and 25%–33% females (Korenkiewicz and Maennig 2023). Moreover, CSR decoupling is decreased by 20%–60% women (Gull, Atif, and Hussain 2023), and 40%–60% female directors promote modern slavery reporting (Moussa et al. 2023).

5.2.2 | Two-Tier Systems

We know rather little on the impact of a critical mass of female directors on CSR outcomes in countries with a two-tier system (15 studies). As prior studies recognized heterogeneous measures, no clear impact can be stated. Regarding absolute measures, a critical mass of two females leads to an increased level of CSR performance (Wang and Yang 2025) and environmental innovation (He and Jiang 2019). Similar results on a critical mass of two or three women are stressed by Ren et al. (2024). At least three females are connected with higher levels of CSR performance (Khidmat et al. 2022), natural disaster donations (Jia and Zhang 2013), environmental performance (Gong et al. 2021) and green patents (Chu 2024). Liu et al. (2023) documented a positive influence of a critical mass of two, three, four, and five women on water reporting. Two insignificant results occurred for CSR performance and at least three women (Yang et al. 2019; Wieland and Flavel 2015; supervisory board level).

Relative measures were neglected with a few exceptions. According to Zulvina and Setiawan (2024), more than 40% female directors and CSR reporting are positively connected. However, Wieland and Flavel (2015) did not find a significant relationship between 20% and 60% women and social reporting.

5.2.3 | Voting Right Between One-Tier and Two-Tier Systems

Similar to our remarks on two-tier systems, prior studies on regimes with a voting right between one-tier and two-tier systems are low (8 studies), leading to major research gaps. A few studies documented that a critical mass of two (Harjoto and Rossi 2019; Houcine and Derouiche 2024) and three females (Cambrea et al. 2023; De Masi et al. 2022) positively contribute to CSR

performance. A critical mass of three women also relates to higher degrees of CSR reporting (De Masi et al. 2021; Macchioni et al. 2025). However, Burkhardt et al. (2020) stressed an insignificant relationship between a critical mass of more than 10% women and CSR performance.

5.3 | Country-Specific Studies With a Focus on Board Gender Quotas

5.3.1 | Mandatory Board Gender Quotas

In comparison to voluntary settings, we stress a low amount of studies on the impact of a critical mass of BGD on CSR in regimes with mandatory board gender quotas (21 studies). However, based on absolute measures, a critical mass of at least three women leads to higher levels of CSR outcomes. This is in line with critical mass theory (Kanter 1977), as researchers stressed increased levels of CSR performance (Cambrea et al. 2023), environmental performance (De Masi et al. 2022), CSR donations (Lin et al. 2018), and environmental innovation (Garcia-Meca et al. 2024: female support specialists). Similar results occurred for at least three women and CSR reporting (Cabeza-Garcia et al. 2018; De Masi et al. 2021; Macchioni et al. 2025), social reporting (Arora et al. 2025), and environmental reporting (Arora and Aliani 2023). Kaur et al. (2024) stressed a positive contribution of at least two or three independent females on CSR expenditures. Furthermore, a critical mass of at least two women leads to an increased level of CSR performance (Harjoto and Rossi 2019; Houcine and Derouiche 2024) and social reporting (Arora and Singh 2024). However, a few insignificant results on the link between at least three female directors, CSR performance (Menicucci and Paolucci 2023; Wieland and Flavel 2015; supervisory board level), and CSR reporting can be found. Similar results were stressed for two or three females and CSR reporting (Manita et al. 2018; Rahman et al. 2024).

Prior studies in regimes with mandatory board gender quotas rather neglected the recognition of relative measures of critical mass. Burkhardt et al. (2020) found a positive impact of at least 10% women on environmental performance, whereas Wieland and Flavel (2015) stressed an insignificant impact of 20%–60% females on social reporting.

5.3.2 | Voluntary Board Gender Quotas

Prior research has concentrated on regimes with voluntary gender quotas (42 studies). Based on absolute measures and in line with critical mass theory (Kanter 1977), there are clear tendencies that a critical mass of females is positively linked with CSR outcomes. This especially relates to a critical mass of three women and CSR performance (16 studies). In detail, at least three female directors increase the level of overall CSR performance (Khidmat et al. 2022), social performance (Arayakarnkul et al. 2022; Cook and Glass 2018; Pinheiro et al. 2024; Tunyi et al. 2023), environmental performance (Gong et al. 2021), green patents (Chu 2024), natural disaster donations (Jia and Zhang 2013), carbon performance (Toukabri and Jilani 2023), emissions performance (Kyaw et al. 2022),

and it decreases the probability of discrimination and environmental lawsuits (Abebe and Dadanlar 2021; Liu 2018). Three studies also found similar results for the impact on CSR reporting (Mazumder 2025) and carbon reporting (Furtuna and Sönmez 2024; Lemma et al. 2023).

We also note eight studies which stressed a positive impact of at least two female directors on CSR performance (Wang and Yang 2025; Yarram and Adapa 2021), environmental investments (Atif et al. 2020), renewable energy consumption (Atif et al. 2021), environmental innovation (He and Jiang 2019), CSR reporting (Hassan 2025), and carbon reporting (Ben-Amar et al. 2017; Hollindale et al. 2019). According to Ren et al. (2024), a critical mass of two or three women is linked with increased CSR performance. Two studies found a positive impact of at least four females on CSR performance (Zharfpeykan and Bai 2025) and modern slavery reporting (Moussa et al. 2023). Moreover, BGD and water reporting are positively related, based on a critical mass of two, three, four, and five women (Liu et al. 2023).

However, some studies stressed an insignificant impact of a critical mass of two (Boulouta 2013), three (Au et al. 2023; Cordeiro et al. 2020; Yang et al. 2019), and two or three females (Konadu et al. 2022) on CSR performance and specific subpillars. Bose et al. (2022) found no empirical evidence for the need of a critical mass of female board members for CSR improvements. According to Manita et al. (2018), at least two or three women do not impact CSR reporting.

In line with our remarks on regimes with mandatory board quotas and specific board systems, prior researchers almost neglected the inclusion of relative measures of critical mass in settings with voluntary gender quotas (5 studies). Researchers stressed that at least 10%, 20%, or 40% (Al-Shaer et al. 2024) and 25%–33% females (Korenkiewicz and Maennig 2023) lead to increased CSR performance. This also related to CSR reporting and a critical mass of 20%–60% (Gull, Atif, and Hussain 2023), 40%–60% (Moussa et al. 2023), and more than 40% females (Zulvina and Setiawan 2024).

5.4 | Summary of the Major Results

In line with critical mass theory (Kanter 1977), we note the tendency that a critical mass of BGD is positively related to CSR outcomes. This is especially related to CSR performance as the prominent CSR variable in this review (60 studies). As prior research on the impact of a critical mass of female directors on CSR reporting (quality) is significantly lower (32 studies), this might lead to skewed conclusions. However, we stress the major interrelations between CSR reporting and performance, as several performance measures are normally a subpart of CSR reports. Moreover, in line with stakeholder-agency theory (Hill and Jones 1992), stakeholders react positively to increased levels of CSR reporting quality, assuming a positive impact of CSR reporting on CSR performance.

Researchers have mainly stressed the positive direction between female directors and CSR outcomes in cross-country studies and based on an absolute measure of at least three women. A positive

impact of a critical mass of three females on CSR could also be stated for country-specific studies in regimes with a one-tier system. Studies on two-tier systems and in regimes with a voting right between both systems are too low in amount. Moreover, the positive relationship between at least three female directors, CSR performance, and reporting is linked to countries with mandatory and voluntary gender quotas. This result contrasts with our assumption that stakeholders reward a voluntary inclusion of a critical mass of females more than reaching compliance with the law. In line with stakeholder-agency theory (Hill and Jones 1992), gender quota regulations may be ineffective and lead to regulatory symbolism. Thus, empirical evidence of the real effects of BGD regulations is uncertain. Among others, some regimes have restricted gender quotas on specific listed firms and specific boards (e.g., Germany), which decrease the impact of a critical mass of female directors on CSR outcomes. A critical mass of female directors, based on tilted or balanced groups (Kanter 1977), is not existent in some gender quota regulations from a global perspective. Similar symbolic use of BGD may also be possible in regimes with voluntary gender quotas as an opportunistic management strategy. If stakeholders do not trust these unethical BGD strategies, negative consequences on CSR outcomes are realistic. This may explain our heterogeneous results in the review.

However, in view of the low amount of studies with relative measures of critical mass and the variety of included proxies, we cannot identify any precise tendency of the link between critical mass and CSR.

6 | Restrictions of Prior Studies and Research Recommendations

6.1 | Critical Mass Variables

We have already stressed that prior research on the critical mass of BGD and CSR outcomes mostly focused on absolute measures, such as at least three female directors, while relative measures were rarely used. The validity of absolute measures of critical mass is limited due to the main impact of firm and board size on the selection of female directors. It should be easier for larger firms with an increased board size to reach a critical mass of two or three female directors in comparison to smaller firms with a reduced number of board members. Thus, we encourage future researchers to recognize relative measures of critical mass as a “best practice.” Consequently, future studies should use the quotient of female board members and board size. In this context, researchers should clearly distinguish between executive and non-executive directors. We also stated that prior studies used heterogeneous relative measures of critical mass, leading to a low comparability. A huge variety of proxies (10%–60%) can be found. The strict reference to the three categories of Kanter (1977) (skewed boards: up to 20%, tilted boards: >20%–40% and balanced boards: >40% and less than 60% females) should be important for future critical mass studies. It is also useful to recognize a wide range of absolute and relative measures of critical mass in the research design to increase the validity of regression results. In view of the restrictions of external ESG databases, researchers should analyze the corporate governance and diversity reports of listed firms to

create innovative BGD proxies. Compared with manual content analyses, the recognition by automated textual analyses, such as artificial intelligence (AI) tools, is helpful to cover a wide range of observations.

Except for Garcia-Meca et al. (2024), Kaur et al. (2024), and Wieland and Flavel (2015), prior studies did not connect other board diversity characteristics with a critical mass of female directors. Among others, it is questionable whether a critical mass of women is needed for the executive and non-executive board level to improve CSR outcomes. Moreover, other demographic characteristics, such as board age and nationality, and human capital, such as CSR-related skills, should be integrated in future studies. As female directors on boards are assumed to be more independent and more sensitive to CSR issues, these attributes should be explicitly addressed. As annual corporate governance and diversity are often rather vague in description, researchers should evaluate the individual CV's of board members to combine BGD with other board diversity proxies.

6.2 | CSR Variables

As the majority of prior research on the impact of a critical mass of BGD on CSR outcomes used CSR performance, future studies should address the quality of CSR reporting in more detail. We recommend to rely on different stakeholder groups as major components of social reporting, such as disclosure on customer and supplier relationships in the value chain, and employee satisfaction. Qualitative research methods, such as surveys or interviews, are important to analyze the individual preferences of specific stakeholders on BGD and their intended impact on CSR outcomes. Moreover, we should increase our knowledge on the relationship between the critical mass of female directors and specific subpillars of environmental reporting, for example, biodiversity, circular economy, or waste disclosure. Future research designs should analyze environmental and social reporting separately in view of the heterogeneous topics and board incentives. An increased number of researchers conducted automated text analyses of CSR reporting, for example, with Python and AI tools, in recent years (Velte 2023b). Among others, future research designs may analyze tone, readability, and similarity of CSR reports and address whether a critical mass of females has an impact on these quality measures. Based on a mixed approach, future researchers are invited to recognize CSR performance and reporting, such as the impact of BGD on carbon reporting quality and carbon emissions (‘climate talk and walk’).

Except for Eliwa et al. (2023), former studies did not analyze the link between a specific quorum of females and CSR decoupling as the difference between CSR reporting and performance. In view of the increased regulatory initiatives on mandatory CSR reporting and board gender diversity, it is questionable under which circumstances female boards may significantly reduce the risk of corporate greenwashing. While the degree of CSR decoupling is mostly analyzed by a comparison of specific CSR performance and reporting measures within external databases, such as Bloomberg, a more detailed analysis of specific quality dimensions of CSR reporting via text analyses, for example, tone or readability, is recommended.

6.3 | Moderator Variables

The majority of included studies in this literature review addressed the impact of a critical mass of females on CSR outcomes as additional analyses. Consequently, we note a low amount of moderator analyses on this relationship (e.g., Au et al. 2023; Bazel-Shoham et al. 2023). Referring to firm characteristics, other corporate governance characteristics, such as board effectiveness, compensation, and ownership structure, may moderate the impact of a critical mass of females on CSR. This strategy highlights the complexity of corporate governance systems. Moreover, corporate financial attributes, such as financial slack and performance, may impact the relationship between BGD and CSR. In view of the increased number of regulations on mandatory board gender quotas, country-specific studies should analyze potential regulatory effects of the implementation of specific gender quotas, for example, the EU gender quota directive, on CSR.

Cross-country studies should include country effects as moderators. Country-related measures of gender equality, cultural aspects (e.g., feminism), based on the Hofstede database or the World Values Survey, and stakeholder awareness may be classified as useful moderators of the impact of a critical mass of female directors on CSR outcomes. Future international studies should differentiate between one-tier and two-tier systems to analyze potential different impacts of BGD on CSR. A careful separation between regimes with voluntary and mandatory board gender quotas increases the validity of cross-country research.

7 | Summary

Boards of directors of PIEs are under stakeholder and regulatory pressure to increase CSR efforts, leading to increased levels of CSR reporting and performance (Temiz and Acar 2023). BGD represents the most important corporate governance attribute in this context (Bhuiyan et al. 2021). While an increased number of meta-analyses (e.g., Alfi et al. 2025) and literature reviews (e.g., Banno et al. 2023) have recognized the impact of overall BGD on CSR issues, we lack a focus on critical mass theory (Kanter 1977) in prior research. In view of the heterogeneous link between female directors and CSR, we assume that female directors must reach a critical mass to substantively contribute to better CSR outcomes. This literature review included 92 archival studies on the impact of a critical mass of female directors on CSR performance and reporting as major CSR outcomes. Based on stakeholder-agency (Hill and Jones 1992) and critical mass theories (Kanter 1977), we assumed a positive relationship between a critical mass of BGD, CSR performance, and reporting. We differentiated between absolute and relative measures of critical mass and separated country-specific studies into their board structure and regulations on board gender quotas. We found that most studies relied on absolute measures of critical mass, CSR performance, and country-specific studies based on regimes with a one-tier system and a voluntary recognition of BGD (e.g., the USA). There is empirical evidence that a critical mass of at least three women increases CSR outcomes in cross-country studies and regimes with a one-tier system. In contrast to our assumptions, this positive link is valid in

countries with voluntary and mandatory board gender quotas. This opens the discussions on the real effects of current board gender regulations.

While empirical research on the critical mass of females on CSR has increased in recent years, we stressed major research gaps, leading to useful recommendations for future research. Among others, future research should recognize relative measures of critical mass in line with the categorization of Kanter (1977), include innovative measures of CSR reporting quality and related subpillars, moderator variables and regulatory effects of mandatory board gender quotas. We expect an increased research activity on this topic in future years due to increased regulatory initiatives on board composition and CSR from an international perspective and the current “Anti Diversity, Equality & Inclusion (DEI)” strategy of the US-American administration.

Our literature review has some restrictions, as we only included the number of significances and did not recognize sample or effect sizes in our vote-counting approach (Light and Smith 1971). While we relied on double-blind journal articles in English language to guarantee an appropriate validity of our review, we stress an increased heterogeneity regarding sample size within included studies. Cross-country studies with an increased volume of observations are linked with a higher external validity of research results compared with country-specific studies with a low volume of included firms. These diverse sample sizes were not recognized in our literature review, leading to an equal inclusion of empirical results. This also related to our moderator analyses. Meta-analyses overcome these restrictions of vote counting, leading to statistical outcomes dependent on specific sample sizes of included studies. As critical mass and CSR variables are too heterogeneous and the number of studies in specific subcategories is low, a quantitative meta-analysis is not useful at the moment. Moreover, we restrict our study to the board level and neglect the effect of other board characteristics, such as independence or expertise.

In the following, we stress some managerial implications of your analyses. Regardless of the existence of legal board gender quotas, firms should actively engage in recognizing a critical mass of female directors on the executive and non-executive board level. This requires a sound diversity strategy, related management systems, processes, and a diversity report as part of CSR reporting. BGD is confronted with a potential symbolic use for self-impression management to attract stakeholders. This may lead to an opportunistic “pinkwashing” behavior, based on a major mismatch between external gender diversity disclosure and actual diversity performance (Lefley and Janecek 2024a, 2024b). The recognition of a critical mass of female directors of three women and the implementation of ambitious targets to increase the level of BGD increases the probability of substantive diversity strategies and a positive impact on CSR performance and reporting (Abed et al. 2025). Otherwise, stakeholders have doubts on the linkage between female directors and CSR, leading to negative stakeholder reactions and lower firm reputation.

Regarding regulatory implications of our study, we found hints for a positive impact of a critical mass of female directors on CSR in countries with voluntary and mandatory gender quotas. Thus, the effects of board gender regulations on CSR efforts are

questionable. Prior regulations are linked with various thresholds of gender quotas, different ranges of firms, and reporting duties. Standard setters, such as the International Sustainability Standards Board (ISSB) and the Global Reporting Initiative (GRI), should foster an international harmonization of board gender quotas for PIEs and related diversity reporting. Diversity disclosure should also include the specific roles and profiles of female board directors and their CVs to analyze their individual CSR experience and expertise. In view of the recent “Anti DEI” strategy of the US-American administration, we stress the major risk that other regimes with increased regulatory actions on diversity and CSR, such as the European Union (EU) and the related Green Deal project, will weaken their ambitions. Recently, the EU controversially discussed an “Omnibus” package that could lead to significant reductions in diversity and CSR efforts for PIEs, such as CSR reporting and supply chain duties.

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