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Critical mass of female directors, human capital, and stakeholder engagement by corporate social reporting

María-Florencia Amorelli[1,2] | Isabel-María García-Sánchez[3]

[1] Universidad Ort (Uruguay), Montevideo, Uruguay

[2] Universidad de Salamanca, Salamanca, Spain

[3] IME-Instituto Multidisciplinar de Empresa, Universidad de Salamanca, Salamanca, Spain

Correspondence
García-Sánchez, Isabel-María, IME-Instituto Multidisciplinar de Empresa, Facultad de Economía y Empresa, Universidad de Salamanca, Campus Miguel de Unamuno, Edificio FES, Salamanca 37008, Spain.
Email: lajefa@usal.es

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Abstract

This paper aims to examine two closely related issues: first, the effect of the presence of female directors on boards on corporate social responsibility disclosure, focusing on the necessary critical mass of this minority group, and, second, the moderation of the human capital of board members—their background, skills, and experience—that could favor the intrinsic female directors' characteristics through the cognitive effect of equal board members. For an international sample of 9,744 firm-year observations from 2007 to 2016, different panel data regressions are proposed. The findings of this study reveal a positive impact of gender board diversity on voluntary socially responsible disclosure by examining the presence of at least three women on the board—the critical mass. Moreover, the paper reports a greater effect when the board's background, skills, and experience are greater. As a supplemental analysis, the evidence shows that the female role does not remain when women achieve the position of chairperson; that is, female directors adopt a male stereotype regarding voluntary information disclosure when they are also the chairperson of the firm, independently of the human capital of the board members.

KEYWORDS

background, board of directors, corporate governance, corporate social responsibility disclosure, critical mass, experience, female directors, skills

1 | INTRODUCTION

The rise of corporate social responsibility (CSR) as a new model of business behavior is closely linked to the disclosure of social and environmental information. This allows the different interest groups to know companies' commitment to sustainability in detail. However, not all companies are equally concerned about the interests and demands of stakeholders. There are important differences in the quantity and quality of the reported CSR information (Boiral & Henri, 2017; Herremans, Nazari, & Mahmoudian, 2016; Moratis & Brandt, 2017; Cubilla-Montilla, Nieto-Librero, Galindo-Villardón, Vicente Galindo, & García-Sánchez, 2019).

Under this information heterogeneity, corporate governance mechanisms must be designed with the aim of guaranteeing the information demands of the stakeholders. This would imply a reduction in the opportunistic behavior of those to whom the responsibility is delegated, exercising control over the actions of the managers and monitoring and controlling their behavior and decisions. As the basis of corporate governance (García-Sánchez, Rodríguez-Domínguez, & Frías-Aceituno, 2015), among the main tasks of the board of directors is the supervision of management actions (Fama & Jensen, 1983), playing a relevant role in the CSR disclosure policy.

Previous studies have shown whether and how the board composition and structure significantly influence the disclosure of information (García-Sánchez & Martínez-Ferrero, 2018a, 2018b). In relation to the board composition, several studies have considered diversity and in particular the role of women in the promotion of CSR practices and disclosure. In general, the empirical evidence suggests a positive relationship between the presence of women on the board, greater CSR performance (Cuadrado-Ballesteros, Martínez-Ferrero, & García-

Sánchez, 2017; Setó-Pamies, 2015), and greater transparency of these practices (Arayssi, Dah, & Jizi, 2016; Ben-Amar, Chang, & McIlkenny, 2015; Cabeza-García, Fernández-Gago, & Nieto, 2017; García-Sánchez, Suárez-Fernández, & Martínez-Ferrero, 2019; Khan, Khan, & bin Saeed, 2019; Liao, Luo, & Tang, 2015).

Women, according to the female stereotype, have stronger moral standards and are socially more sensitive, emotional, and empathic than men (Boulouta, 2013). These characteristics lead women in decision-making positions (e.g., female directors) to take into account the interests of multiple stakeholders. Men, on the other hand, tend to focus on economic cost/benefit analysis without considering other decision criteria (Hillman, 2014). The above could explain at least part of the differences between companies in relation to CSR performance and disclosure, focusing on the gender diversity on corporate boards.

However, critical voices have emerged in recent years, suggesting that the influence of women on the promotion of CSR disclosure practices could be due to reputational motivations. In this respect, Hyun, Yang, Jung, and Hong (2016) highlighted reputational concerns and asserted that women focus on CSR due to it being seen as an opportunity to improve their position of power within the organization. In addition, they can influence how actively and thoroughly they will play their role in the board in relation to the promotion of CSR. This argument can be extrapolated not only to the promotion of CSR practices but also to their disclosure.

In the same way, several studies have found a nonsignificant (Giannarakis, Konteos, & Sariannidis, 2014; Khan, 2010; Prado-Lorenzo & García-Sánchez, 2010) or even negative relationship (Lorenzo, Sánchez, & Gallego-Álvarez, 2009) between the presence of women on boards and the extent of CSR disclosure. Consequently, the empirical evidence remains inconclusive in relation to the presence of female directors and its impact on the promotion and dissemination of CSR information.

In this sense, this paper aims to analyze in more depth the necessary conditions for the benefits traditionally assigned to gender diversity, according to the resource dependence and social identity theories, to lead to better CSR informative practices. This is because diversity is a double-edged sword. It is necessary for women to feel that they are part of the board to promote their creativity. In general, as Nielsen and Huse (2010a) posited, female directors need to be perceived as valuable board members. Thus, it is interesting and important to identify the conditions under which women on boards impose their female stereotypes and identities on the CSR disclosure policy.

In this regard, the token theory argues that women are a minority group and often encounter barriers to expressing their opinions and being heard. In minority board scenarios, female directors could face significant limitations in influencing the board decision making regarding CSR disclosure (Cook & Glass, 2017). According to the critical mass theory, the presence of at least three women on the board is necessary for them to exert their influence on decisions (Torchia, Calabrò, & Huse, 2011).

In addition, it is necessary for the psychological climate of the board, known as the "boardplace," to favor the insertion of female directors and not to limit their potential contribution to board decision making. According to Walt and Ingley's (2003) premise, the effective decision making of female directors requires a balance between their presence and the human capital of the board members. The study defends the idea that directors' human capital, associated with their background, skills, and experience, could reflect the contextual environment of boards in which female directors have the perception of being equal board members (Bear, Rahman, & Post, 2010) due to these intangible characteristics enhancing group discussions and improving the consideration of different opinions in the decision-making process (Van Knippenberg, De Dreu, & Homan, 2004).

To test the research propositions, the paper uses a sample of international listed firms consisting of 9,744 firm-year observations for the period 2007 to 2016. The evidence confirms the greater socially responsible disclosure of information when women are represented on boards and reach a critical mass of at least three female directors. The main result reveals the moderating role of the background, skills, and experience of board directors. When the human capital of directors is greater, there is a greater positive effect of female directors on the promotion of CSR disclosure policies. However, complementary evidence has confirmed that the similarities between men and women in the chairperson position are greater than the differences. Women who follow top management careers generally reject female stereotypes and hence adopt male characteristics that are more valued in leadership positions. The position of chairperson changes the female stereotype and its focus on CSR disclosures regardless of the human capital of the board.

This research is organized as follows. Section 2 describes the literature review that underpins the research hypotheses. The third section shows the data collection, variable measurement, and model specification. Section 4 describes the descriptive and empirical results and discusses them. Finally, the conclusions, implications, and limitations are presented in Section 5.

2 | LITERATURE REVIEW AND CENTRAL RESEARCH QUESTIONS

Several previous studies have indicated that the disclosure of information on CSR allows companies to minimize the agency costs associated with asymmetric information problems (Martínez-Ferrero, Ruiz-Cano, & García-Sánchez, 2016) and enables them to benefit from lower costs of capital (Dhaliwal, Li, Tsang, & Yang, 2014; Martínez-Ferrero et al., 2016) due to the greater precision of analysts' forecasts (Dhaliwal, Radhakrishnan, Tsang, & Yang, 2012; Garrido-Miralles, Zorio-Grima, & García-Benau, 2016). In addition, greater CSR transparency allows the reinforcement of moral legitimacy (Zhang, Zhu, & Ding, 2013) before a wide range of interest groups and society; it also enables the improvement of the corporate reputation (Arayssi et al., 2016; Bear et al., 2010) and the reinforcement of the stakeholders' trust (Odriozola & Baraibar-Diez, 2017).

Consequently, given the substantial heterogeneity in CSR commitment, the recent literature has focused on examining why and how some companies are more socially responsible and show a stronger voluntary disclosure strategy than others. The literature has agreed in suggesting that both the board structure and the board composition could partially explain these differences. The findings of Babío Arcay and Muiño Vázquez (2005) revealed that the adoption of a series of good governance practices has a significant influence on the communication of voluntary information.

Thus, certain characteristics of the board could determine the policy of promotion or disclosure of information on CSR (Haniffa & Cooke, 2005; Khan, 2010). Several studies have identified factors such as board independence (Barako & Brown, 2008; Liao et al., 2015), board size (Frías-Aceituno, Rodríguez-Ariza, & García-Sánchez, 2013; Haniffa & Cooke, 2005), and the presence of a CSR committee (Fuente, García-Sánchez, & Lozano, 2017; Liao et al., 2015), among others. The results obtained by Bear et al. (2010), Boulouta (2013), Setó-Pamies (2015), Helfaya and Moussa (2017), and Tejedo-Romero, Rodrigues, and Craig (2017) suggest that boards with greater gender diversity among their members show a greater propensity to disseminate information that is more relevant and reliable and allows their stakeholders to know their commitment to sustainability (Giannarakis et al., 2014). Therefore, the structure of the board of directors, particularly in terms of gender diversity, seems to be a key factor in reinforcing and promoting transparency in CSR.

2.1 | Female directors and CSR disclosure

The literature to date has attempted to examine the contribution of women on boards under the premises of the resource dependency and social identity theories. The resource dependency theory (Pfeffer & Salancik, 1978) states that the board must provide the firm with critical resources. From this perspective, heterogeneous boards in terms of composition perform their functions and roles better because their members have different points of view, skills, and professional experience. Heterogeneity can be addressed by diversity, understood as the difference or distinction between the characteristics of its members. Board diversity contributes a greater amplitude of knowledge, opinions, and perspectives and exerts a positive influence on the transparency of corporate information; it is a determinant factor in boards' decision to enhance and improve the disclosure, transparency, and accountability processes (Frías-Aceituno et al., 2013). In this regard, diversity in terms of gender brings different perspectives, skills, and resources to boardrooms (e.g., personal attributes, experiences, and values) that improve their performance. Female directors bring values and professional experiences that are different from men's and are more likely to represent the female stereotype (i.e., empathic behavior and more social sensitivity), improving firms' social performance (Boulouta, 2013). Additionally, the number of women on boards could act as a signal to external stakeholders; it may indicate the firms' commitment to women as a minority group and to socially responsible behavior (Bear et al., 2010).

According to the social identity theory, individuals use demographic attributes—for example, gender, race, or age—to classify themselves, as well as others, among various social categories (e.g., feminine and masculine) and possess a social identity based on belonging to those groups or categories (Tajfel, 1982). By defining themselves in terms of group memberships, the behavior of individuals is affected by belonging to the social categories with which they identify (Ashforth & Mael, 1989). This leads to women on boards acting in accordance with their female stereotype, according to which they are more socially sensitive, emotional, and empathic than men (Boulouta, 2013), contributing different points of view and heterogeneity to the decision-making process.

Women tend to be more sensitive than their male counterparts and can influence decisions about certain organizational practices, such as CSR performance and reporting policies (Nielsen & Huse, 2010a). A greater presence of women on boards seems to influence the reach of social disclosure positively, supporting the premise that women are more conscious of social concerns (Giannarakis et al., 2014).

From the above two theoretical positions, in general, the empirical evidence suggests a positive relationship between gender diversity on boards and (a) greater CSR commitment (Bernardi & Threadgill, 2010; Fernández-Gago, Cabeza-García, & Nieto, 2016; Kassinis, Panayiotou, Dimou, & Katsifaraki, 2016; Kirsch, 2016; Rodríguez-Ariza, Cuadrado-Ballesteros, Martínez-Ferrero, & García-Sánchez, 2017) and (b) greater information transparency (Barako & Brown, 2008; Fernandez-Feijoo, Romero, & Ruiz-Blanco, 2014; Post, Rahman, & Rubow, 2011; Rodríguez-Ariza, Frías-Aceituno, & Rubio García, 2013). Female directors take strategic decisions from a more socially responsible perspective; accordingly, they improve the relationship with stakeholders and promote the firm's ethical behavior.

In addition, the different perspectives of men and women are of great value to ensure a balanced approach between the economic, the social, and the environmental (Setó-Pamies, 2015). This effect is supported by Liao et al. (2015)—who examined the disclosure of carbon emissions—and Fernandez-Feijoo et al. (2014) and Arayssi et al. (2016)—who focused on sustainability reporting. On the basis of the above, the prior evidence agrees that, as the gender diversity on a board increases, so does the firm's commitment to the policies and practices relevant to CSR (Bear et al., 2010; Cook & Glass, 2017), favoring and promoting their informative transparency.

2.2 | From tokens to critical mass

Nonetheless, the strategic importance of women on boards of directors has been widely debated by academics. Although women have made important advances in representation, the integration of women on boards represents a small minority, and boards continue to be dominated by men. In this setting, individuals could exhibit a favorable bias toward others whom they perceive as strong members of their group, affecting individual decision making. Thus, there will generally be a tendency to listen more to the opinions of the majority members (e.g., men) and to reject the ideas that come from the representatives of the minorities (e.g., women; Mathisen, Ogaard, & Marnburg, 2013). Therefore, the proposed benefits of diversity in CSR voluntary reporting are less likely to materialize (Hillman, Nicholson, & Shropshire, 2008).

In this regard, several studies have given relevance to the numerical representation of women on boards. Cook and Glass (2017) analyzed the representation thresholds that are necessary for women to influence corporate CSR policies. Their findings positively associated female representation with greater commitment to CSR. They showed that the presence of one or two women, in comparison with all-male boards, is enough to exert an impact on that commitment. However, other authors affirmed that, as the presence of female directors on boards increases (in number or as a percentage of the total), the impact on companies' CSR ratings grows (Bear et al., 2010; Kassinis et al., 2016). Recent studies have supported the assertion that, to enable female representation to have a significant influence on board decisions, a critical mass of at least three women must be reached (Ben-Amar et al., 2015; Fernandez-Feijoo et al., 2014; Post et al., 2011). That is, the positive effects of the presence of women are obtained if a minimum number of three are present, enough for their influence to generate significant changes on boards (Nekhili, Chakroun, & Chtioui, 2018).

These arguments are mainly based on the fact that minority groups are often considered to be tokens and could encounter barriers to expressing their opinions and being heard. The token theory (Kanter, 1977) exposes the difficulties that women face in organizations (e.g., exclusionary practices and behaviors) as members of a group that is significantly underrepresented. In this respect, the study by Nielsen and Huse (2010b) examined how female directors contribute to the decision-making process; the authors pointed out that they are perceived as "unequal" board members, which minimizes their participation in decision making. These limitations reduce women's ability to contribute effectively to organizations by having less influence than their male counterparts and less access to organizational resources. Therefore, female directors could have a limited capacity to influence decision making about CSR corporate policies and practices (Cook & Glass, 2017) and, consequently, CSR disclosure. This perspective suggests that these obstacles can be reduced by hiring more women (Zimmer, 1988).

Meanwhile, the critical mass theory posits that three or more women are necessary to overcome the limitations of being considered as tokens by the majority. From this perspective, when women's representation on boards reaches a critical mass, gender ceases to be a barrier to acceptance and communication. There is a greater likelihood that the opinions and contributions of female directors will be heard and supported by the majority (Konrad, Kramer, & Erkut, 2008), thereby exerting a stronger influence on the results (Cook & Glass, 2017).

In this respect, Torchia et al. (2011) investigated whether a greater number of women on boards result in the accumulation of the critical mass that substantially contributes to the innovation of the company. The authors observed that, once the number of women moves from being a symbol or token to being a consistent minority of "at least three women," they can constitute the desired critical mass, so their opinions can contribute to the level of organizational innovation. According to Konrad et al. (2008, p. 12), some of the benefits of increasing the number of women on boards include "providing different perspectives on the issues, expanding the content of the discussions, raising issues that pertain to multiple stakeholders, asking difficult questions about tough issues, and using interpersonal skills to positively influence board processes." The aforementioned study suggested that boards containing three or more women tend to raise issues that are considered to be "soft" by men, such as those related to the community, diversity, or the firm's reputation. In this sense, Fernandez-Feijoo et al. (2014)) showed that boards with a greater female representation of at least three women favor and enhance CSR disclosure.

Consequently, to advance the understanding of the impact of women on boards on CSR voluntary disclosure, it is important to consider their presence and their number, that is, this minority group's size (Fernandez-Feijoo et al., 2014; Torchia et al., 2011). The above arguments underpin the following hypothesis. A positive effect on CSR disclosure of women on boards is expected, examining the critical mass necessary to influence decision making:

H1: Female directors favor socially responsible disclosure when they represent a critical mass on the board.

2.3 | Human capital of boards as a moderator: Background, skills, and experience

To date, previous studies have analyzed the role of board gender diversity in enhancing CSR performance and disclosure. However, they have not studied the influence of the difficulty involved in controlling, monitoring, and managing diverse boards. In this regard, Milliken and Martins (1996) argued that board diversity could be considered from a double perspective: On the one hand, it increases creativity, diversity of opinions, and experiences; on the other hand, it increases the possibility that the minority will disagree with the rest of the board members by not identifying with them. That is, the greater the diversity in a boardroom, the less integrated the group will be. In this context, it is possible to talk about diverse boards but not effective and productive boards unless an adequate work environment is created for understanding the value of diversity. This environment is termed the boardplace.

The previous arguments found their starting point in the cognitive revolution, considering that individuals respond to stimuli from the environment. However, the environment and its influence on the individual depend on the psychological component that each one of them grants. In this vein, James and Jones (1974) defended the so-called psychological climate. This refers to the way in which individuals influence and are influenced by their work, colleagues, superiors, remuneration, career opportunities, and so on. The main influencing factors are associated with the cooperation among members, the friendliness, and the work climate in the group.

Thus, for Johns (2001), the influence of the environment in which decision making takes place is such that it often favors or on the contrary limits the behavior, attitudes, and decisions of individuals—in this study, of female directors. That is why—given the influence of the boardplace on the commitment of female directors to CSR disclosure

—this paper investigates in greater depth how the context of the board influences women on boards and their CSR disclosure commitment.

This research links the "psychological climate" of the board with some human capital of its members. Regarding the human capital of the board members creating the boardplace, several variables have been identified as important. This research focuses on educational background, skills, and experience as determinants of the boardplace. As Bear et al. (2010) stated, the board's human capital is associated with the experience, knowledge, and capabilities of its members; these are resources that favor the understanding and effective solution of problems by the board as well as fostering commitment to CSR, which can be extended to disclosure. Walt and Ingley (2003) also defended the idea that the impact of woman on board decision making requires a balance of the human capital of its members that favors the understanding of the firm's environment.

This human capital plays a powerful role in the boardplace of female directors and thus could moderate the impact of a certain size of the minority group (female directors) on the dissemination of CSR information. It is necessary to highlight that, following Bradshaw and Wicks (2000), only when the rest of the board members listen to them are women effective board members. In this respect, this study posits that a positive attitude of the board members is determined by greater human capital of directors—background, skills, and experience—as the contextual environment of boards.

At this point, whether and how the human capital of boards of directors affects women's ability to be equal board members and CSR disclosure are the underlying issues that this paper aims to address. To evaluate and favor the strategies of the dissemination of CSR information and the inclusion of women as determining members of the board, every company needs its directors to have sufficient knowledge, experience, and skills in this regard (Hillman & Dalziel, 2003).

On the one hand, female directors as a minority group usually work in boards in which, as Nielsen and Huse (2010b, p. 7) stated, a "variation in group composition leads to an increase in the skills, abilities, knowledge and information of the team as a whole." These attributes could enhance the group discussion (Van Knippenberg et al., 2004) and then affect the decision-making process regarding CSR disclosure strategies. As Hillman et al. (2008) posited, female directors can have professional backgrounds from outside business that offer different perspectives to the board, which could benefit the quality of CSR disclosure.

Moreover, the study considers that, when boards present higher levels of human capital in terms of less visible differences, such as background, skills, and experience (Thatcher & Jehn, 1998; Williams & O'Reilly, 1998), female directors could adopt a diverse compositional approach. These board attributes have a significant effect on female directors' perception of equal board members (e.g., Tsui, Egan, & O'Reilly, 1992; Tsui, Porter, & Egan, 2002). They are aspects of the boardplace, to which all the members bring different skills, diversity, and experience, gathering people with different backgrounds and therefore different opinions and enriching the decision-making process (Arfken, Bellar, & Helms, 2004). Having broad and heterogeneous perspectives in the decision-making process is fundamental for complex decisions, such as those related to CSR (Rao & Tilt, 2016). Moreover, the paper defends the assertion that, in this boardplace of boards with higher human capital, there is a lack of gender stereotype biases and female directors are not captive in relation to their appearance and behavior during board meetings; this context enriches the decision-making process of the board as a result of the perception of female directors as equal board members.

Additionally, although the evidence is limited given the difficulty involved in measuring these variables, Rao and Tilt (2016) expected that directors with greater experience and expertise have the potential to influence positively the disclosure of CSR information at the board level. In this respect, Krüger (2009) reported that longer experience, measured using the tenure of directors, improves skills and expertise, affecting the ability of firms to manage their social and environmental risks effectively.[1] Greater experience of board members—even on other corporate boards—allows them to offer different alternatives and points of view, providing the rest of the members with information about how to deal with other companies with similar problems or decisions.

Regarding education and professional background, although their effect on board decisions and on CSR disclosure seems to be much more complex than it appears, some previous studies have offered certain arguments in that respect. Dahlin, Weingart, and Hinds (2005) clearly posited that the education of top managers expands the information used in decision making, reflecting their cognitive ability and skills. Bear et al. (2010) suggested that more diverse boards in terms of educational and professional backgrounds could favor decision making, because more perspectives and issues are considered, thus making them more effective. Chang et al. (2017) also proposed that these backgrounds are determinants of better engagement in CSR issues—and hence disclosure. Meanwhile, Kassinis and Vafeas (2002) asserted that the educational/functional background plays an important role in the decisions on CSR. Thus, directors like academics, politicians, or members of the clergy often align with the interests of society.

Overall, according to the previous perspectives, reaching a critical number of female directors is desirable, because it increases the diversity of viewpoints within a group, favoring the dissemination of CSR information. Furthermore, it is expected that the CSR disclosure strategy could benefit from the background, skills, and experience of board members if female directors are perceived as equal board members and can reinforce the firm's CSR commitment. The above arguments about the effect on CSR disclosure of women on boards in which they are perceived as a group of equal members allow the following hypothesis to be put forward:

H2: The background, skills, and experience of board directors reinforce the positive orientation of female directors toward socially responsible disclosure when they represent a critical mass on the board.

[1]Nonetheless, Krüger (2009) evidenced a negative impact of directors' experience on CSR outcomes. They usually focus on long-term investments and avoid any risk that could damage their professional career and reputation.

3 | DATA, MEASURES, AND MODEL SPECIFICATION

3.1 | Data collection

Data were collected from Thomson Reuters Eikon[2] for a period of 10 years (2007–2016) for all nonfinancial firms belonging to America; Europe, the Middle East, and Africa (EMEA); and Asia, comprising 3,594 companies from 31 stock indices. After excluding observations with missing information, a final sample of 9,744 firm-year observations was available. The study's sample is composed of firms from 26 different countries (Australia, Belgium, Bermuda, Canada, China, Finland, France, Germany, Hong Kong, Ireland, Italy, Japan, Luxembourg, Macao, Mexico, The Netherlands, New Zealand, Papua New Guinea, Russia, Singapore, South Africa, Spain, Sweden, Switzerland, the United Kingdom, and the United States).

3.2 | Measures

3.2.1 | Dependent variable: CSR disclosure

Corporate social responsibility disclosures are measured by undertaking a content analysis of sustainability information, according to the compliance of the content of these reports with the Global Reporting Initiative (GRI) recommendations (Clarkson, Li, Richardson, & Vasvari, 2008; García-Sánchez & Martínez-Ferrero, 2017, 2018a, 2018b). The comparison between CSR reporting information and GRI guidelines allows the determination of whether this information is global, comparable, and harmonized.

Our dependent variable, "CSR_report," takes values between 0 and 60, representing the level of standardization of CSR information disclosed measured against the recommendations of the G4.1 GRI standards, which are valid until June 2018. To create this variable, a value is assigned to the variable "CSR_report": 0 for companies that do not disclose CSR information; 20 for companies that disclose CSR information that does not comply with the GRI guidelines. For companies that follow GRI recommendations, we add the number of generic (maximum 58) and specific (maximum 92) GRI indicators disclose, but, in order to take into account comparability, we relativize these values on a scale of 20 points according to the in accordance options establish in the G4. In this sense, we assign 20–40 points for companies that disclose CSR information following the GRI guidelines and state (or not) that it is in accordance with the core option—for each identified material aspect, the organization should provide the generic disclosures on management approach and at least one indicator; and 40–60 for companies that disclose CSR information following the GRI guidelines and state (or not) that it is in accordance with the comprehensive option—for each identified material aspect, the organization should disclose the generic disclosures on management approach and all the indicators related to the material aspect.[3] Table 1 shows the score of the dependent variable attending to the GRI option reported.

3.2.2 | Explanatory variables: Female directors and human capital of boards

To examine the number of women, as Torchia et al. (2011) proposed, a dummy variable is created, which is called "Critical_mass" and coded as one if boards have at least three women and zero otherwise. As these authors argued, this dummy variable allows the use of a single regression equation to represent multiple groups (female minorities).

In line with previous studies (Jehn & Bezrukova, 2004; Torchia et al., 2011), with respect to the specific board background, skills, and experience, this study uses the following measures to create its human capital board proxy: "B_Background" is a categorical variable that takes the value 1 if the functional background of the board directors is administrative; the value 2 if it is marketing and customer service; the value 3 if is finance; and the value 4 if it is operations; "B_SpecificSkills" is the percentage of board members who have either an industry-specific background or a strong financial background; and "B_Experience" is a numerical variable that represents the average number of years for which each board member has been on the board.

These variables are grouped by a factorial analysis; the results are shown in Table 2. The Kaiser–Meyer–Olkin (KMO) measure of sample suitability is 0.554, which is higher than 0.5, the minimum variable of suitability. This means that the results of the factorial analysis provide an adequate basis for the empirical examination. The results show one factor, "HC_Board," that defines the human capital of the board across firms. All of the variables have a positive charge on the factor.

3.2.3 | Control variables

We also included a number of variables influencing the quality of CSR reports. These control variables are included in accordance with previous studies (Dhaliwal et al., 2012; Fondevila, Moneva, & Scarpellini, 2019; Harjoto & Jo, 2014; Martínez-Ferrero, Suárez-Fernández, & García-Sánchez, 2019; Siueia & Wang, 2019; Torchia et al., 2011; Vaz Ogando, Ruiz Blanco, & Fernández-Feijoo Souto, 2018). They include firm, board, and institutional aspects. Among the firm-level aspects, the following are included: "Size," measured as the natural logarithm of total assets; "ROA," measured as the return-on-assets ratio; "MtB," as the ratio market to book value; "Leverage," measured as the ratio long-term debt to total assets; "KZ," measured as the capital constraints or access to finance using the KZ index (Kaplan & Zingales, 1997) for every firm-year. More concretely, the KZ index is

[2]Thomson Reuters Eikon is a database that integrates financial and nonfinancial information (CSR, ethics, corporate governance, etc.) of over 6,000 international companies, allowing the analysis of the investments made by these firms, their adaptation to their strategy, and the risk of the portfolio.

[3]According to García-Sánchez et al. (2014), until 2013, the information obtained was measured against the recommendations of the G3.1 GRI standards by determining the level of application of the GRI guidelines: C, B, or A, ranked from low to high levels of usefulness and comparability. Aiming to achieve a comparison with the G-4 levels, level C/C+ represents a very basic report with minimal indicators—these reports are very basic, and the study assigns the value 20–40; level B/B+ corresponds to a medium–high-quality report—the reports have medium–high quality, and the researchers assign the value 20–40; and level A/A+ reflects a high-quality report, and the authors assign the value 40–60—reports are advanced and of high quality.

TABLE 1 CSR information reports

CSR_report		
0 points	Companies that do not disclose CSR information.	
20 points	Companies that disclose CSR information not adapted to the GRI guidelines.	
20–40 points	Companies that disclose CSR information adapted to the GRI guidelines and states (or not) that it is in accordance with either the core option. The core option contains the essential elements of a sustainability report. The core option provides the background against which an organization communicates the impacts of its economic, environmental, and social and governance performance. *GRI G3.1: Companies that disclose CSR information adapted to the C/C+ level of the GRI guidelines, so these reports are very basic. *GRI G3.1: Companies that disclose CSR information adapted to the B/B+ level of the GRI guidelines, so the reports have medium–high quality.	Companies that disclose CSR information adapted to the GRI G4 guidelines. The G4 Sustainability Report Guidelines offers two options to an organization in order to prepare its sustainability report in accordance with the guidelines: the core option and the comprehensive option. Each option can be applied by all organizations, regardless of their size, sector, or location. The focus of both options is on the process of identifying material aspects. Material aspects are those that reflect the organization's significant economic, environmental, and social impacts or substantively influence the assessments and decisions of stakeholders.
40–60 points	Companies that disclose CSR information adapted to the GRI guidelines and states (or not) that it is in accordance with the comprehensive option. The comprehensive option builds on the core option by requiring additional standard disclosures of the organization's strategy and analysis, governance, and ethics and integrity. In addition, the organization is required to communicate its performance more extensively by reporting all indicators related to identified material aspects. *GRI G3.1: Companies that disclose CSR information adapted to the A/A+ level of the GRI guidelines, so their reports are advanced and they have high quality.	

Source: The authors following García-Sánchez and Martínez-Ferrero (2017, 2018a).

Abbreviations: CSR, corporate social responsibility; GRI, Global Reporting Initiative.

a linear pondered combination of cash flow-to-total capital, cash holding-to-total capital, dividends-to-total capital, debt-to-total capital, and market-to-book ratios (García-Sánchez, Hussain, Martínez-Ferrero, & Ruiz-Barbadillo, 2018). "IA," representing the information share and its higher absolute value, identifies higher asymmetric information. It is calculated by the ratio-forecasted earnings per share divided by the actual earnings per share; "COC," representing the ex ante cost of capital based on the model proposed by Easton (2004); and "Analysts," as a measure of the natural logarithm of the number of analysts following the firm through a year (García-Sánchez, Gómez-Miranda, David, & Rodríguez-Ariza, 2019a, 2019b). Among the board-level variables are the following: the size of the board, "BSize," measured as the total number of directors on the board; "BAttendance," measured as the total number of meetings held in the year and acting as a proxy for the level of activity; "CEO_noduality," a dummy variable that takes the value 1 if the CEO of a firm is not also the chairperson and 0 otherwise; board independence, "BInd," as the percentage of independent directors on board; "CEOBoardMember," a dummy variable that takes the value 1 if the CEO is also a board member and 0 otherwise; and the existence of a CSR/sustainability committee on the board, "CSRCom," as a dummy variable that takes the value 1 if there is a committee or a director to deal with sustainability issues and 0 otherwise.

TABLE 2 Factorial analysis of human capital of board

	HC_Board
B_Background	0.572
B_SpecificSkills	0.489
B_Experience	0.493
Kaiser–Meyer–Olkin (KMO) Measure of sample suitability	0.554
Bartlett test of sphericity (chi square)	394.490
P value	0.000

Given the use of an international sample of analysis, a number of institutional-level control variables are also included. The paper defines two numerical variables—"STAKELAW" and "CSRLAW"—following the previous studies by Dhaliwal et al. (2014) and Garcia-Sanchez, Cuadrado-Ballesteros, and Frias-Aceituno (2016). "STAKELAW" and "CSRLAW" are two proxies developed by Dhaliwal et al. (2012, 2014) to represent stakeholder orientation. The first variable assesses the legal environment of a country with regard to the protection of labor rights and benefits (Dhaliwal et al., 2014). "STAKELAW" is the average score of four indices obtained from La Porta, Lopez-de-Silanes, Pop-Eleches, and Shleifer (2004) and Botero, Djankov, Porta, Lopez-de-Silanes, and Shleifer (2004). These indices are associated with employment laws, social security laws, collective relations laws, and human rights laws. According to Dhaliwal et al. (2014), "CSRLAW," as a stakeholder orientation factor, is an ordinal variable coded 1 if the country of origin has disclosure requirements for sustainability issues that are mandatory only for industrial or for pension funds; 2 if the mandatory disclosure requirements are for both activity sectors; and 0 otherwise.

Finally, to control for variation across time, country, and industry, "Year" and "Industry" dummies are included.

3.3 | Models and technique of analysis

The econometric models proposed are examined using dependence techniques for panel data. The use of a panel data set allows the study to overcome the low explanatory capacity of cross sectional and time series analysis; it considers several periods and firms and thus provides greater consistency and explanatory power. Moreover, panel data allow the study to control for unobservable heterogeneity, such as the particular behavior and characteristics of each company that are invariant over time; it is controlled by modeling it as an individual effect, ηi, which is then eliminated by taking the first differences of the variables. Moreover, panel data lead to more informative data, greater variability, less collinearity among variables, more degrees of freedom, and greater efficiency than cross-sectional or time period methods.

This research applies different regression models to the panel data. The analytic technique employs the dynamic panel estimator proposed by Arellano and Bond (1991), based on the generalized method of moments (GMM). This dynamic panel estimator corrects the endogeneity problem and controls for unobservable heterogeneity. More concretely, the study uses the two-step estimator of Arellano and Bond (1991).

The paper statistically tests several closely related relationships: (a) the effect that different sizes of the minority group (critical mass) could have on CSR disclosure for achieving equal board members and (b) the moderating effect of the background, skills, and experience of board members on the previous relationship. The hypotheses are tested using multiple lineal regressions as follows. First, the paper proposes a model in which the critical mass indicator, "Critical_mass," and the control variables are regressed on CSR disclosure, "CSR_report," as follows:

$$\begin{aligned}\text{CSR\_report}_{it} = {} & \delta_1\text{Critical\_mass}_{it} + \delta_2\text{Size}_{it} + \delta_3\text{ROA}_{it} + \delta_4\text{Mtb}_{it} \\ & + \delta_5\text{Leverage}_{it} + \delta_6\text{KZ}_{it} + \delta_7\text{IA}_{it} + \delta_8\text{COC}_{it} \\ & + \delta_9\text{Analysts}_{it} + \delta_{10}\text{BSize}_{it} + \delta_{11}\text{BAttendance}_{it} \\ & + \delta_{12}\text{CEO\_nonduality}_{it} + \delta_{13}\text{BInd}_{it} \\ & + \delta_{14}\text{CEOBoardMember}_{it} + \delta_{15}\text{CSRCom}_{it}\delta_{16}\text{CSRLAW}_{it} \\ & + \delta_{17}\text{STAKELAW}_{it} + \sum_{j=18}^{40}\delta_j\text{Industry}_{it} + \sum_{k=41}^{50}\delta_k\text{Year}_t + \mu_{it} \\ & + \eta_i.\end{aligned}$$

Second, to examine the moderating role of the human capital of board members (based on their background, skills, and experience), the paper proposes a second model in which it regresses on "CSR_report" the indicator "Critical_mass," the human capital of the board indicator, "HC_Board," the interaction "Critical_mass*HC_Board," and the control variables:

$$\begin{aligned}\text{CSR\_report}_{it} = {} & \delta_1\text{Critical\_mass}_{it} + \delta_2\text{HC\_Board}_{it} \\ & + \delta_3\text{Critical\_mass*HC\_Board}_{it} + \delta_4\text{Size}_{it} + \delta_5\text{ROA}_{it} \\ & + \delta_6\text{Mtb}_{it} + \delta_7\text{Leverage}_{it} + \delta_8\text{KZ}_{it} + \delta_9\text{IA}_{it} + \delta_{10}\text{COC}_{it} \\ & + \delta_{11}\text{Analysts}_{it} + \delta_{12}\text{BSize}_{it} + \delta_{13}\text{BAttendance}_{it} \\ & + \delta_{14}\text{CEO\_nonduality}_{it} + \delta_{15}\text{BInd}_{it} \\ & + \delta_{16}\text{CEOBoardMember}_{it} + \delta_{17}\text{CSRCom}_{it} \\ & + \delta_{18}\text{CSRLAW}_{it} + \delta_{19}\text{STAKELAW}_{it} + \sum_{j=20}^{42}\delta_j\text{Industry}_{it} \\ & + \sum_{k=43}^{52}\delta_k\text{Year}_t + \mu_{it} + \eta_i.\end{aligned}$$

All the models incorporate a firm-specific effect, η_i, which controls the unobservable heterogeneity that affects firms' decision-making processes, whereas μ_{it} represents the disturbance term. The firm is represented by i, and t refers to the time period. δ are the parameters to be estimated.

4 | RESULTS

4.1 | Descriptive results

Table 3 reports some descriptive statistics and correlations for all the analyzed variables. Regarding the main variables of this paper, in the range between 0 and 60, the mean value of CSR disclosure is low, being 14.779; however, it increases to 15.809 in firms with at least one female director on the board. The table offers the first evidence about the impact of the presence of women on boards and the CSR disclosure strategy. Meanwhile, 4,323 firm-year observations belong to firms in which the board has at least three female directors as the critical mass of the minority group. In terms of control variables, for example, the board size is around 11 directors, and on average, 62.308% of them are nonexecutive.

Panel B reports the bivariate correlations between variables; high values are not identified, and thus, multicollinearity problems are not found.

4.2 | Critical mass of women on boards and CSR disclosure: The moderating role of the human capital of board members

The results of the GMM regression models used to test the relationships proposed are obtained using the Stata software. The paper reports the coefficient and the standard error associated with the explanatory variable. It also reports the Arellano–Bond test for AR(2) in first differences and the Hansen test of overidentification restrictions.

The main findings, reported in Table 4, are the following. In Model 1, the presence of at least three women on the board is positive and significant in explaining CSR disclosure ($\delta_1 = 3.065$, $p < .01$). This result suggests that there is a positive relationship between a certain size of the minority group of women on boards (at least three) and the quality of CSR disclosure. In this respect, the study supports the critical mass perspective; when there are at least three women on the board, the barriers to minority groups exerting an influence are avoided, and

TABLE 3 Descriptive statistics and correlation matrixes

Panel A. Mean and standard deviation of variables used in regressions						
	Full sample		Board without women		At least one women on board	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
CSR_report	14.779	16.988	11.473	14.400	15.809	17.593
Size	2.086	6.201	2.042	6.134	2.100	0.622
ROA	1.122	35.778	0.188	8.961	1.406	40.549
MtB	54.061	202.078	28.712	161.746	63.967	215.003
Leverage	8.039	824.855	17.759	363.901	5.088	920.201
KZ	0.027	0.646	0.075	1.093	0.011	0.388
IA	0.395	5.834	0.662	8.952	0.295	4.096
COC	0.221	3.128	0.117	1.888	0.296	3.642
Analysts	15.897	9.382	14.185	8.179	16.322	9.611
BSize	10.668	3.267	9.465	3.490	11.034	3.105
BAttendance	0.322	0.467	0.362	0.481	0.309	0.462
BInd	62.308	28.223	45.626	30.970	67.376	25.239
CSRLAW	0.699	0.848	0.636	0.828	0.803	0.868
STAKELAW	12.909	4.552	12.482	4.125	13.613	5.100
	Frequency	%	Frequency	%	Frequency	%
Critical_mass	4,323	38.02	-	-	4,323	100
CEO_nonduality	3,311	33.98	642	28.28	2,669	35.71
CEOBoardMember	8,450	89.24	1,891	85.84	6,559	90.27
CSRCom	6,237	64.01	1,202	52.95	5,035	67.37

Panel B. Bivariate correlations between variables used in regressions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. CSR_report	1.000																	
2. Critical_mass	0.071	1.000																
3. HC_Board	0.032	0.663	1.000															
4. Size	−0.053	−0.014	−0.039	1.000														
5. ROA	−0.034	0.027	0.044	−0.028	1.000													
6. MtB	0.000	0.006	0.017	−0.026	−0.004	1.000												
7. Leverage	0.032	0.077	0.030	0.045	−0.019	0.016	1.000											
8. KZ	−0.004	−0.019	−0.019	−0.007	−0.002	0.000	−0.016	1.000										

(Continues)

TABLE 3 (Continued)

Panel B. Bivariate correlations between variables used in regressions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
9. IA	0.025	−0.031	−0.019	−0.006	−0.013	0.012	0.023	−0.003	1.000									
10. COC	0.072	−0.009	−0.031	−0.039	0.009	0.003	0.014	−0.005	−0.003	1.000								
11. Analysts	0.065	0.040	−0.030	−0.034	0.025	−0.029	0.024	−0.005	−0.003	0.910	1.000							
12. BSize	0.055	0.197	−0.070	−0.008	0.085	−0.044	0.134	0.003	0.021	0.020	0.033	1.000						
13. BAttendance	0.051	0.107	0.215	−0.170	0.112	−0.009	−0.027	0.008	−0.007	−0.066	−0.046	0.286	1.000					
14. CEO_nonduality	0.109	−0.032	−0.049	0.054	−0.050	−0.012	−0.063	−0.001	0.045	−0.037	−0.043	−0.240	−0.256	1.000				
15. Bind	−0.079	0.069	0.072	0.108	0.029	−0.006	0.064	0.005	0.017	−0.010	−0.002	0.167	0.090	−0.297	1.000			
16. CEOBoardMember	0.025	0.303	0.059	0.225	−0.017	−0.047	0.069	−0.004	−0.043	0.026	0.041	0.072	−0.182	−0.016	0.197	1.000		
17. CSRCom	−0.142	0.011	0.005	0.255	−0.015	−0.012	0.025	−0.004	0.011	−0.121	−0.111	−0.060	−0.052	0.007	0.175	0.237	1.000	
18. CSRLAW	0.046	0.154	0.137	−0.032	0.066	−0.007	−0.018	0.013	−0.048	0.008	−0.002	0.153	0.200	−0.037	−0.026	−0.016	0.044	1.000
19. STAKELAW	0.185	0.008	0.004	−0.148	−0.043	0.052	−0.108	−0.001	−0.003	0.049	0.040	−0.167	−0.025	0.320	−0.257	−0.090	−0.144	−0.010

Note. Sample: 9,744 observations in 2007–2016.

the ideas and opinions of women toward CSR disclosure are listened to by the rest of the board members.

Additionally, the paper examines the moderation of the background, skills, and experience of board members. In Model 2, the presence of a critical mass of three or more female directors on the board is again positively significantly associated with the quality of CSR reporting (δ_1 = 3.130, $p < .01$). This again supports the suggestion that, for female representation to have a significant influence on the CSR disclosure policy, a firm must reach a critical mass of at least three women. Aiming to examine the moderating role of the human capital of board members, associated with their functional background, skills, and experience, it is necessary to operate with coefficients. In this respect, the interaction term made by the critical mass of female directors and the human capital of the board, "Critical_mass*HC_Board," is positively significant (δ_3 = 2.510, $p < .01$). The paper supports the idea that the greater quality of CSR information as a result of greater representation of female directors on boards—of at least three women—is enhanced when the functional background, specific skills, and experience of the board members are higher (δ_1 = 3.130 + δ_3 = 2.510 = 5.640) than when the human capital of the board is lower (δ_1 = 3.130). That is, the positive impact on the quality of CSR disclosure when female directors achieve a critical mass of at least three members is reinforced and complemented by higher human capital of the board, thus supporting its moderating role.

The results are the opposite in Model 0, those estimated in order to test the role of women in firms in which they are a minority (female directors are less than three). The variables "Women < 3" and "Women < 3*HC_Board" are nonsignificant from the statistical point of view (δ_1 = 0.035, $p > .10$; δ_1 = −1.914, $p > .10$, respectively). These null effects confirm the results of Models 1 and 2 in relation to the need to have a critical mass of female directors. Moreover, these results indicate that when there is a minority of women on boards, their opinion is not considered by the rest of the directors, even when they have greater skills, experiences, and professional training or background.

4.3 | Supplemental analysis: Female chairperson

Gender mainstreaming has been adopted internationally as a strategy to achieve gender equality. Mainstreaming includes the integration of a gender perspective into the design, implementation, and evaluation of policies, regulations, and programs with the aim of promoting equality between women and men and counteracting discrimination. The ultimate goal is to achieve gender equality and maintain it over time (Lee-Gosselin, Briere, & Hawo, 2013).

The academic literature in relation to gender mainstreaming within organizations shows that in practice, it achieves mainly symbolic results (Benschop, Mills, Mills, & Tienari, 2012). Over the last years, international and national organizations have been committed to women's rights and gender equality, and many organizations have developed programs and measures for the inclusion of gender mainstreaming. However, in practice, women are still a minority at the higher levels of decision making, because there are still factors

TABLE 4 Regression analysis linking the critical mass of female directors and human capital of boards on quality of corporate social responsibility disclosure

	Model 0		Model 1		Model 2	
	Coefficient	*SD*	Coefficient	*SD*	Coefficient	*SD*
Main variables						
Critical_mass			3.065***	0.188	3.130***	0.440
HC_Board	2.221***	0.072			0.734***	0.151
Critical_mass*HC_Board					2.510***	0.374
Women < 3	0.035	0.108				
Women < 3*HC_Board	−1.914	1.710				
Control variables						
Size	0.000***	0.000	0.000***	0.000	0.000***	0.000
ROA	28.141***	0.819	11.581***	0.632	11.475***	1.368
MtB	0.015***	0.001	−0.001	0.000	0.001	0.001
Leverage	−0.005	0.004	−0.009***	0.000	−0.009***	0.000
KZ	−9.416***	0.468	−5.753***	0.277	−4.918***	0.632
IA	0.002***	0.000	0.000**	0.000	0.000***	0.000
COC	0.029***	0.008	0.008***	0.001	0.005***	0.000
Analysts	0.099***	0.011	0.044***	0.016	0.059**	0.030
BSize	0.313***	0.021	1.073***	0.035	0.991***	0.090
BAttendance	1.222***	0.116	5.903***	0.228	4.924***	0.527
CEO_nonduality	−0.773***	0.102	−1.596***	0.090	−1.958***	0.182
Bind	0.096***	0.005	0.004	0.006	0.026**	0.011
CEOBoardMember	−2.344***	0.140	−0.113	0.321	−1.660***	0.464
CSRCom	0.371***	0.138	0.982**	0.411	1.791***	0.482
CSRLAW	−0.000***	0.000	−1.565***	0.544	−1.925***	0.571
STAKELAW	0.000***	0.000	0.298**	0.117	0.425***	0.063
Controlled by year and industry						
AR(2) Arellano–Bond test			Pr > z = 0.921		Pr > z = 0.157	
Hansen test			Prob > χ^2 = 1.000		Prob > χ^2 = 0.870	

Sample: 9,744 observations in 2007–2016.

Abbreviation: SD, standard deviation.

*90% statistical significance.

**95% statistical significance.

***99% statistical significance.

that limit the progress of women in organizations (Benschop et al., 2012; Lee-Gosselin et al., 2013). Breaking the glass ceiling is still a considerable challenge. In this sense, the results of Arfken et al. (2004) on the progress in the composition of boards showed a minimal improvement in the representation of women and even less regarding reaching the main role of chairperson. This confirms the presence of glass ceilings as a reason for the limited participation of women in boardrooms. This fact has also been observed in top management positions, in which the female representation is still relatively low and cases of women who manage to break the glass ceiling to become CEOs are shown as exceptions to the rule (Athanasopoulou, Moss-Cowan, Smets, & Morris, 2018).

Although the leadership style of chairperson and CEO is quite different (Nekhili, Nagati, Chtioui, & Nekhili, 2017), these authors observed that female chairs are more valuable for family firms, companies in which women are more effective due to they use a transformational leadership style. Results that are not extrapolate to nonfamily firms. So we expect that when women reach a top position, CEO or chairperson, in contrast to addressing stereotype barriers, could reject female stereotypes because they probably show needs, values, and leadership styles that are similar to those of men that are more valued in leadership positions (Athanasopoulou et al., 2018). Thus, the results obtained by Athanasopoulou et al. (2018), based on personal conversations with 151 CEOs (139 men and 12 women), suggested that women in their role as leaders engage in behaviors that are linked to the male stereotype (e.g., strategic thinking and a sense of comfort in situations of uncertainty and risk). Besides, the results of Nielsen and Huse (2010a) suggested that the impact of women on boards depends on the nature of the task performed; the study concluded that there are no general differences in behavior between women and men in leadership positions. These results are consistent with studies that have argued that the similarities between men and women in leadership styles are greater than the differences (Nielsen & Huse, 2010a). The previous findings, therefore, can be extrapolated to women in their role as chairmen of boards of directors.

In this regard, it should be noted that board chairmen have a dual role. On the one hand, they occupy a leading position on the board. On the other hand, they hold a position similar to the rest of the members, as they have no special legal authority. However, in the chairperson's position, they are considered as leaders and are responsible for ensuring effective board performance, playing a key role by taking responsibility for organizing and supervising the decision-making processes (Bezemer, Nicholson, & Pugliese, 2018). In addition to the responsibility of ensuring that the correct decision elements are considered and the necessary information is available to make informed decisions, their role is reinforced by their key position as a link between the board of directors and the CEO (Bezemer et al., 2018). Consequently, does the position of chairperson change the female stereotype and its focus on CSR disclosures? Does the human capital of board members moderate this relationship?

Examining the relationship between female directors and CSR disclosure and the moderating role of the human capital of the board requires the analysis of women's behavior when they reach leadership positions (e.g., chairperson). With this aim, the paper proposes as a supplemental analysis the following research model. It regresses CSR disclosure on the same indicators as Model 2B, but it also includes a dummy variable, "Chairperson," representing the chairperson of the firm and the interactions with each explanatory variable. This variable takes the value 1 if the chairperson is a woman and 0 otherwise.

$$\begin{aligned}\mathrm{CSR\_report}_{it} = {} & \delta_1 \mathrm{Critical\_mass}_{it} + \delta_2 \mathrm{HC\_Board}_{it} \\ & + \delta_3 \mathrm{Critical\_mass{*}HC\_Board}_{it} + \delta_4 \mathrm{Chairperson}_{it} \\ & + \delta_5 \mathrm{HC\_Board{*}Chairperson}_{it} \\ & + \delta_6 \mathrm{Critical\_mass{*}Chairperson}_{it} \\ & + \delta_7 \mathrm{Critical\_mass{*}HC\_Board{*}Chairperson}_{it} \\ & + \delta_8 \mathrm{Size}_{it} + \delta_9 \mathrm{ROA}_{it} + \delta_{10} \mathrm{Mtb}_{it} + \delta_{11} \mathrm{Leverage}_{it} \\ & + \delta_{12} \mathrm{KZ}_{it} + \delta_{13} \mathrm{IA}_{it} + \delta_{14} \mathrm{COC}_{it} + \delta_{15} \mathrm{Analysts}_{it} \\ & + \delta_{16} \mathrm{BSize}_{it} + \delta_{17} \mathrm{BAttendance}_{it} \\ & + \delta_{18} \mathrm{CEO\_nonduality}_{it} + \delta_{19} \mathrm{BInd}_{it} \\ & + \delta_{20} \mathrm{CEOBoardMember}_{it} + \delta_{21} \mathrm{CSRCom}_{it} \\ & + \delta_{22} \mathrm{CSRLAW}_{it} + \delta_{23} \mathrm{STAKELAW}_{it} \\ & + + \sum_{j=24}^{46} \delta_j \mathrm{Industry}_{it} + \sum_{k=47}^{56} \delta_k \mathrm{Year}_t + \mu_{it} + \eta_i \qquad (3)\end{aligned}$$

Table 5 reports the results for Model 3. The result of the indicator variable associated with the critical mass of female directors is not significant; however, the interaction with the human capital of board members remains similar to that in Table 4. That is, the interaction term made by the critical mass of female directors and the human capital of the board, "Critical_mass*HC_Board," is positively significant (δ_3 = 10.325, p < .01). The study confirms once again the positive impact on the quality of CSR reporting when female directors achieve a critical mass of at least three members and there is greater human capital of board members.

In this model, however, the most interesting results are those associated with "Critical_mass*Chairperson" and "Critical_mass*HC_Board*Chairperson." First, a critical mass of at least three women on the board is negative and significant in explaining CSR disclosure when one of these women is also the chairperson of the firm (δ_6 =

TABLE 5 Supplemental analyses: How do behave female directors when are chairman?

Panel A		
	Model 3	
	Coefficient	*SD*
Main variables		
Critical_mass	−0.392	0.314
HC_Board	−2.533***	0.210
Critical_mass*HC_Board	10.325***	0.536
Chairperson	6.644***	0.330
HC_Board*Chairperson	−0.901**	0.416
Critical_mass*Chairperson	−3.918***	0.842
Critical_mass*HC_Board*Chairperson	−7.391***	2.693
Control variables		
Size	0.000***	0.000
ROA	8.537*	4.841
MtB	0.020***	0.003
Leverage	−0.009***	0.000
KZ	−28.531***	10.027
IA	0.000***	0.000
COC	(Omitted)	
Analysts	0.466***	0.034
BSize	0.201***	0.048
BAttendance	6.163***	0.697
CEO_nonduality	−1.966***	0.325
Bind	−0.007	0.012
CEOBoardMember	−10.103***	1.251
CSRCom	−0.406	0.382
CSRLAW	−0.721	0.971
STAKELAW	−0.693***	0.213
Controlled by year and industry		
AR(2) Arellano–Bond test	Pr > z = 0.517	
Hansen test	Prob > χ^2 = 0.998	

Sample: 9,744 observations in 2007–2016.

Abbreviation: SD, standard deviation.

*90% statistical significance.

**95% statistical significance.

***99% statistical significance.

−3.918, p < .01). That is, women who are also the chair of the board show values and leadership styles that are similar to those of men, relegating the commitment to CSR transparency. Second, regarding the moderation played by the human capital of the board members, "Critical_mass*HC_Board*Chairperson" is also negatively significant (δ_7 = −7.391, p < .01). Operating with coefficients, the paper supports the assertion that a lower quality of CSR information occurs when at least one of the female directors of the critical mass of at least three women is also the chairperson; this is not limited by a greater functional background, specific skills, and experience of board members (δ_7 = −7.391 + δ_6 = −3.918 = −11.309). That is, the negative impact on the quality of CSR disclosure when female directors achieve a critical mass of at least three members and occupy leadership positions (e.g., chairperson) is even greater with greater human capital of the board. This human capital fails to minimize the male stereotype adopted by female directors in leadership positions.

In addition, when we only consider the chairperson role, we observe a positive impact of "Chairperson" on "CSR_report" (δ_4 = 6.644, p < .01). But this favorable effect is lost when we considered the presence of female directors on boards, as we have indicated in the previous epigraph. Jointly considered, these results could be suggested that women on leadership position could maintain their female stereotype when they are the only woman in the board, perhaps to differentiate themselves from the rest of the male directors. However, when there are other women in the board, they modify their leadership style to achieve greater acceptance by male directors.

4.4 | Discussion of the results

From the above, several interesting findings can be reported. First, the study confirms that, as the number of female directors increases, these minority voices become more assertive; then, their female stereotype in enhancing firm transparency around CSR information is powered. Moreover, it documents the influence of the boardplace on the female perception of equal board members and then on the CSR reporting policy.

This study's evidence supports previous studies. First, it provides support for the assertion that the greater the female representation on the boards, the greater the impact on the firm's commitment to greater transparency of CSR information (Arayssi et al., 2016; Barako & Brown, 2008; Bear et al., 2010; Cook & Glass, 2017; Fernandez-Feijoo et al., 2014; Post et al., 2011).

Second, these results are in accordance with the resource dependency and social identity theories. The positive impact of board gender diversity on CSR disclosure confirms that female directors bring values and professional experience that are different from those of male directors, fulfilling the female stereotype in the decision-making process around CSR disclosure (Boulouta, 2013). These findings provide support for the past evidence that women are more sensitive to social and environmental concerns (e.g., Cook & Glass, 2017; Fernandez-Feijoo et al., 2014).

Third, the study confirms that a critical mass of at least three female directors is necessary to influence corporate CSR policies (in line with Ben-Amar et al., 2015; Nielsen & Huse, 2010a; Torchia et al., 2011). The paper reports that a minimum number of three women are enough for their influence to generate significant changes on boards and thus, there will be a greater likelihood that their opinions about CSR disclosure will be heard and supported by the majority. That is, the study clearly agrees with the previous evidence of Nielsen and Huse (2010a, b) and Torchia et al., 2011). The findings support the critical mass theory, which postulates that a critical mass of women is necessary to solve the limitations of being considered as tokens or "symbols"—a minority group—by the majority; greater female representation of at least three women achieves a perception of equal board members. As Fernandez-Feijoo et al. (2014) suggested, the above evidence means that women can raise issues related to social and environmental disclosure, which are considered by men to be "softer."

Fourth, regarding the moderating role of the human capital of board members, the study provides support for the assertion by James and Jones (1974) and Johns (2001). It confirms the influence of the environment—the psychological climate—on the decision-making process. As they posited, this paper reports that the psychological climate could enhance the behavior, attitudes, and decisions of female directors. The empirical results suggest that a more diverse board in terms of background, skills, and experience—that is, the human capital of board members—favors a more effective decision-making process and the perception of female directors as equal board members. In boards with higher human capital, the gender stereotype biases are minimized, and female directors can positively promote CSR reporting strategies. With this perception of equal members, female directors gain the ability to be heard in their CSR claims, thus enhancing the quality of CSR disclosure. This evidence is in line with the previous studies by Bear et al. (2010) and Chang et al. (2017) about the benefit of the human capital on the board. Moreover, the findings show that the background, experience, and skills of board members are resources of greater human capital, which is positively associated with stronger commitment to CSR issues and concerns (as documented by Bear et al., 2010; Rao & Tilt, 2016; Walt & Ingley, 2003).

Fifth, regarding the supplemental analysis of women as chairmen, the paper clearly provides evidence that female directors adopt a male stereotype in voluntary information disclosure when they also hold the position of chairperson, independently of the human capital of the board members. In this respect, it provides support for the studies by Nielsen and Huse (2010b) and Athanasopoulou et al. (2018), evidencing that, when women reach the chair position, they reject female stereotypes in the promotion of CSR strategies; there are no differences in the CSR commitment of women and men in leadership positions.

5 | CONCLUSIONS

The main research questions proposed in this study are as follows: (a) Is there a critical mass to reach (three female directors) to have an impact on CSR disclosure policy? (b) Does the human capital of board members moderate the relationship between the critical mass of female directors and CSR reporting? This paper tests the effects that an increase in the size of the minority group (of at least three women on the board) may have on CSR disclosure and the moderating role of the background, skills, and experience of board members. Analyses are conducted using multiple lineal regressions for an international sample consisting of 9,744 firm-year observations from 2007 to 2016.

Our findings support the assertion that an increase in the number of female directors from tokens to a critical mass exerts an effective influence on the quality of disclosure of CSR information. In addition, this effect is greater when the board members possess a better background, skills, and experience. The human capital of board members moderates—reinforces—the impact of female directors on socially responsible disclosure. As a supplemental analysis, the evidence shows that the female role does not remain when women achieve a chairperson position; that is, female directors adopt the male stereotype in voluntary information disclosure when they are also the chairperson, independently of the human capital of the board. This paper thus supports the idea that the similarities in the leadership styles of men and women are greater than their differences.

This research presents a number of contributions to the literature. First, the relationship between female directors and CSR disclosure is not yet established, and the evidence is not conclusive. The study thus advances the understanding of the role played by women on boards in the disclosure of CSR voluntary information. The main results answer the question of how female directors contribute to CSR disclosure. They also contribute by reinforcing the understanding of the previous studies on the validity of the token/critical mass theory in the field of corporate governance, incorporating the importance of their number into the debate about the presence of women on boards of directors. Regarding the limited previous studies about the critical mass effect on CSR reporting, the research also sheds light on the relationship between the two. It reports that the quality of CSR disclosure is reinforced when at least three women are present on the board, constituting the critical mass desired to raise CSR reporting issues. Thus, it provides support for the theoretical perspective on the critical mass by investigating how a certain number of female directors on boards favor the dissemination of CSR information; in this sense, women begin to be heard by other nonminority board members and can promote their ideas and behaviors in decision making, particularly to a greater extent when the board members have high human capital. This greater effect is achieved by considering the human capital of board members as a determinant of the boardplace and the environmental conditions in the decision-making process of the board.

In this respect and as the second point, despite the availability of these indicators about female behavior regarding CSR information, the role of human capital in boards remains unexplored. One of the main contributions of this research is the analysis of the moderating role played by the background, skills, and experience of directors as the human capital of the board. The paper assesses the importance of specific variables of board directors associated with their human capital for modeling the relationship between female directors as a critical mass and CSR disclosure. It fills this gap by providing the theoretical underpinnings of the underlying relationships and presenting fact-based evidence about the moderating role of the board's background, skills, and experience.

Moreover, the study contributes to academia by examining the male stereotype that women adopt when they are in leadership positions. Thus, it examines the moderation of not only the human capital of board members on the gender diversity-CSR disclosure relation but also the female role in the chairperson position. It thus advances the knowledge of the different settings in which women on boards show their female role in CSR voluntary disclosure. Finally, from a methodological point of view, the paper reinforces the previous literature by using a panel data set of 9,744 firm-year observations and by proposing dependency econometric models tested using the GMM estimator.

This paper also identifies a number of implications for managers, directors, owners, and regulatory bodies by clearly reinforcing the debate around the critical mass of female directors on boards. This study's findings provide useful evidence for the debate about the importance of the number of women on boards, as a minority group, by clearly examining the critical mass of female directors. The findings contribute to the investigation of the importance of the number of women on boards as a minority group. For managers, owners, and investors, it is important to know the size of the minority group of women that is necessary to reinforce and enhance their CSR disclosure policy; this policy in turn could benefit the firm through superior performance, a lower cost of capital, and a better image and reputation—among other outcomes. Moreover, they must be aware of the necessary human capital of board members that reinforces the perception of female directors being equal board members. By examining the boardplace, the study provides directors, managers, and organizations with knowledge and recommendations for an effective gender diversity impact on CSR reporting. It provides evidence about how the background, skills, and experience of board members favor the decision-making process promoted by female directors around CSR disclosure. This human capital creates a favorable boardplace for female directors. Thus, the results also have some implications for boards of directors to create an appropriate workgroup environment —the boardplace. The findings suggest that background, skills, and experience benefit a workplace that supports female decisions and emphasizes the dissemination of CSR information. The authors suggest that firms can reinforce their CSR disclosure strategy by promoting a boardplace in which directors have greater human capital. Finally, the paper also evidences relevant results for regulatory bodies about the presence of female directors on boards. At present, there is a global tendency to change the composition of boards of directors. The development of good corporate governance practices and legal or regulatory changes is intended to increase transparency with respect to the representation of women on boards and in senior management positions. Although some European countries have established actions to promote the inclusion of women on boards (e.g., France, Italy, Norway, and Spain), the percentage of women on boards remains low.

Although the current study adopts rigorous methods to investigate the research questions proposed, its results should be interpreted carefully, because it is subject to certain limitations. First, it complements the prior literature with evidence drawn from an international sample beyond the previous single-country analyses (e.g., Torchia et al., 2011). However, the sample shows a notable bias toward U.S. and U.K. firms. Moreover, it consists only of public firms; reliable data on nonlisted firms are difficult to obtain. To generalize the findings beyond the listed sample, the paper recommends that researchers explore the evidence in nonlisted small- and medium-sized businesses. This research also examines the impact of the number of women on boards, from tokens to critical mass, on the quality of CSR reporting and the moderation of the background, skills, and experience of board members; however, other attributes of board members could be examined as moderators—for example, age, career concerns, managerial ability, or nationality. Although the study identified several attributes of board members contributing to the effect on CSR reporting of female directors, there are undoubtedly others that future research should examine.

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ORCID

Isabel-María García-Sánchez https://orcid.org/0000-0003-4711-8631

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