

## RESEARCH ARTICLE

# Corporate social responsibility reporting and capital structure: Does board gender diversity mind in such association?

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## Funding information

The Junta de Castilla y León and the European  
Regional Development Fund, Grant/Award  
Number: CLU-2019-03; The Ministry of  
Science and Innovation, Grant/Award Number:  
GELESMAT (PID2021-122419OB-I00)

## Abstract

This research aims to shed light on the effect of corporate social responsibility (CSR) disclosure on capital structure, a significant strategic policy for all listed companies. Furthermore, it aims to explore the moderating effect of the presence of female directors on corporate boards on the relationship between CSR disclosure and capital structure. We use an international sample of 48 countries for the years 2007–2019 collected from the Thomson Reuters database. This study uses the GMM procedure to estimate the model of the association between the disclosure of CSR information and capital structure and the moderating effect of board gender diversity in such relationship. Drawing on agency theory, the results support the negative relationship between CSR disclosure and capital structure. Moreover, our findings also reveal that board gender diversity does not moderate the association between CSR disclosure and capital structure.

## KEYWORDS

capital structure, corporate governance, corporate social responsibility (CSR), female directors

## 1 | INTRODUCTION

Companies across the world tend to make full use of the competitive advantage gained as corporate social responsibility (CSR) practitioners in their corporate engagement (capital structure), acting as socially responsible organisations taking actions that reflect global sustainable development goals (Sustainable Development Goals, 2019). In this regard, companies usually voluntarily disclose CSR information to make public their CSR disclosure and achievements.

CSR disclosure is considered a key tool, which influences on the communication channel between company and stakeholders in an operative context, and this influence affects investment and financing firms' decisions. Substantial past research in the CSR field shows the positive effects of CSR on business decisions in terms of

firm value (Hu et al., 2018), dividend policy (Benlemlih, 2017), earnings quality (García-Sánchez & García-Meca, 2017), and influence on firms' internal and external resources. The majority of this research has focused on analysing the determinants of CSR, for example, female directors on corporate boards (Ramon-Llorens et al., 2020), institutional investors (García-Meca & Pucheta-Martínez, 2018), financial performance (Barauskaite & Streimikiene, 2021) or corporate reputation (Sánchez-Torné et al., 2020). In contrast, less attention has been paid to the influence of CSR performance on reputational risk (Karwowski & Raulinajtyś-Grzybek, 2021), firm value (Drews, 2010) or the cost of debt (Bacha et al., 2020; Cooper & Uzun, 2015). From this perspective, the strategic influence of CSR on capital structure depends on how stakeholders and creditors take into account CSR disclosure in mitigating scant

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transparency and perceive its benefits on reputation and firm performance.

Companies make important investment and financing decisions; these have become a significant strategy policy (Li et al., 2016) and are based on capital structure and equity capital (Glen & Pinto, 1994). In this regard, Myers (1984) and Myers and Majluf (1984) show that information asymmetry between managers and shareholders creates an order of preference in firms' financing policy. The role of capital structure in the corporate governance field depends on its impact on the structure of corporate ownership and control. Past research focusing on corporate finance argues that capital structure is considered to be a tool for managers to avoid waste of corporate resources (Jensen, 1986). When corporate governance and capital structure are well designed, they are considered a substitute mechanism in mitigating agency problems. Consequently, those firms that disclose CSR information as a corporate governance mechanism have lower levels of capital structure. Gao and Connors (2011) provide evidence that the disclosure of CSR information such as environmental information reduces capital structure, since voluntary disclosure may reduce agency costs.

Research on capital structure also provides evidence about how firms' indebtedness is impacted by certain characteristics: board meetings (Zhai, 2019), firm performance (Singh & Faircloth, 2005), board size (Lorca et al., 2011), board independence (Kweh et al., 2021) and the presence of female directors on boards (Harris, 2014), among others. Past research has also explored the effect of capital structure on CSR disclosure, although the findings obtained are inconclusive (i.e., Brammer & Pavelin, 2006; Oware & Mallikarjunappa, 2021).

Board diversity is another relevant feature, which should be taken in account in the disclosure of CSR information (Coffey & Wang, 1998), since its knowledge and skills allows firms to guarantee an efficient control (Agyemang & Schadewitz, 2019) and it meets the needs of several stakeholders (Harjoto et al., 2015). According to agency theory view, the presence of female directors on boards acts as a key aspect to control managers (Carter et al., 2003) and may reduce information asymmetries and agency problems, resulting in a higher CSR disclosure (Bear et al., 2010; Frias-Aceituno et al., 2013). Scant past literature has checked the presence of female directors as moderator. In particular, Al Matari et al. (2014) and Chin et al. (2019) examined the moderating effect of female directors on the association between board committees and firm performance. Pucheta-Martínez et al. (2021a, 2021b) analysed what moderating role female directors on board played audit committees and CSR disclosure.

In this regard, this paper aims to examine the influence of CSR disclosure on level of capital structure in order to provide more evidence about this topic. CSR has become an important issue for both business and academics over recent years (Barauskaite & Streimikiene, 2021; García-Meca & Pucheta-Martínez, 2018), but this investigation differs from past research in analysing the moderating role of female directors on boards may play between CSR disclosure and firms' capital structure. The consideration of female directors on corporate boards as a moderating role is essential to extend the previous literature focused on corporate governance in two key respects.

In the first place, several countries have made great efforts to include women in positions of responsibility in companies, included in the international sample examined in this study. In this regard, Norway approved a law, which leads to the dissolution of the company if it does not comply with the rules about female directors on boards, or Spain that recommends the inclusion of women in government positions (Gregorič et al., 2017). Second, the role of female directors in positions of responsibility is relevant in the decision-making process as they are conservative and more risk-averse (Byrnes et al., 1999; Man & Wong, 2013) than their counterparts, and this can lead to a reduction in new investment projects or the disclosure of CSR information since sometimes confront risks. Even though, the female stereotype has more sensitive and emphatic (Boulouta, 2013) and are more ethical in their points of views (Eweje & Brunton, 2010) than male stereotype, which take in account the interests of multiple stakeholders. To summarise, we attempt to provide answers to the following questions:

- i. How does CSR disclosure relate to capital structure?
- ii. Is this relationship moderated by the presence of female directors on corporate boards?

To answer these research questions, we have built an international sample of data provided by the Thomson Reuters database, comprising 7636 international firm-year observations from 48 countries during the period 2007–2019. Our evidence indicates that CSR disclosure has a negative effect on capital structure, in line with agency theory. Moreover, the findings also reveal that the presence of female directors on the board does not affect the relationship between CSR disclosure and the level of firms' capital structure. Thus, female directors do not play a moderating role in this relationship.

This research contributes to the growing literature on corporate governance in several ways. First, this investigation extends scant previous literature based on the influence of CSR disclosure on capital structure since most of previous research is based on exploring the association between the value of capital structure and CSR disclosure (Brammer & Pavelin, 2006; Oware & Mallikarjunappa, 2021). In this regard, this study contributes to the literature by reinforcing the understanding of the effect of the association between CSR disclosure and capital structure on the validity of the agency theory in the field of corporate governance. We evidence the importance of decreasing information asymmetries and the capital structure when companies disclose more CSR information. Second, to the best of our knowledge, it is the first investigation into the influence of CSR disclosure on capital structure using a sample of international listed non-financial firms. Previous research has focused on analysing this effect on Bombay companies (Oware & Mallikarjunappa, 2021), for instance, which is based on an individual country, while our research uses a wide international sample of firms operating around the world. Third, previous research has examined the effect of CSR reporting on capital structure (Oware & Mallikarjunappa, 2021), without considering the moderating effect of female directors on boards in this relationship. The sample used in this study is composed by 48 different countries,

where the roles of female directors and the recommendations of including them on corporate boards are different. This paper shows the effect of female directors on corporate boards in international companies, given their different aims and incentives, in relevant issues such as the impact of CSR disclosure on capital structure. Therefore, it provides support for the theoretical perspective on agency theory by investigating how female directors on corporate boards can constrain decisions on capital structure and promote CSR disclosure. This paper assesses the relevance of board composition, particularly board gender diversity, in the association between CSR disclosure and capital structure.

The remainder of the article is structured as follows. In the next section, we describe our theoretical background and hypotheses. Then, we present the methodology, followed by the principal results. The final section contains the conclusions, identifies limitations and suggests future lines of research.

## 2 | THEORETICAL BACKGROUND AND HYPOTHESES

As suggested by Jensen and Meckling (1976), agency theory supports the view that managers are companies' agents: they can make decisions, but do not suffer the consequences of them. Insiders or managers of firms have more past private information and future outcomes about the firm in comparison to outsiders. As an external part, lenders tend to value positively the transparency of the company and, sometimes, introduce restrictions in the capital structure contracts to mitigate agency costs. For this reason, companies provide specific information to mitigate agency costs caused by information asymmetries between principal and agents (Mazumdar & Sengupta, 2005). However, managers may act in their own interests and against of shareholders. Therefore, firms implement external and internal mechanisms to reduce agency costs and mitigate information asymmetries between managers and stakeholders. As a corporate governance mechanism, which reduces information asymmetry (Egginton & McBrayer, 2019), CSR disclosure is considered in several countries to be a voluntary initiative. Firms with high CSR performance will be more likely to have fewer agency problems. CSR reporting allows companies to inform stakeholders about their social responsibilities in society (Verrecchia, 1983).

According to agency theory, the adoption of business strategies that lead to higher CSR and the availability of credible data on companies' CSR strategies reduces information asymmetries and agency costs and results in lower capital constraints (Jones, 1995).

Previous literature shows that CSR disclosure influences firm value (Hu et al., 2018), investments efficiencies (Utami et al., 2021) or firm reputation (Liu & Lu, 2021), among other aspects. In terms of risk-management within company strategy, CSR disclosure increases cash flow stability (Luo & Bhattacharya, 2006), reduces financial difficulties (Lee & Faff, 2009) and acts as a form of insurance for companies during adverse events (Minor & Morgan, 2011). In this respect, firms with high levels of environmental and social commitment invest

in creating opportunities for employees and investors in order to expand and grow (Husted, 2005) and produce higher yields and profits than other companies in their sector (DiSegni et al., 2015). Such firms do not, therefore, need to increase their capital structure. This view is supported by Cormier and Magnan (1999) and Brammer and Pavelin (2006), who find a negative relationship between environmental disclosure and leverage.

The issue of agency between managers and shareholders is an important one, and the presence of female directors on corporate boards tends to mitigate this conflict of interest between parties (Ain et al., 2020). Under agency perspective, female directors on corporate boards act as an effective monitoring mechanism (Bear et al., 2010), are more transparent, more likely to encourage good practices (Pucheta-Martínez et al., 2020) and have strategic board control (Nielsen & Huse, 2010), which may enhance firm performance. In this regard, Eweje and Brunton (2010)—who also draw on management, psychology and sociology approaches—claim that female directors are considered more capable of identifying unethical behaviours and are more risk-averse and conservative than males (Byrnes et al., 1999; Man & Wong, 2013). Faccio et al. (2016) show that female directors tend to make lower-risk investment and financing choices and favour low capital structure. Although agency theory attempts to explain the association between CSR disclosure and capital structure, past research using the moderating effect of female directors on boards of directors on this relationship is unknown. For this reason, an analysis of the role played by female directors on boards between CSR reporting and the level of firms' capital structure merits our attention.

### 2.1 | CSR disclosure and capital structure

CSR disclosure is a vital feature in the corporate governance field and has an impact on capital structure. CSR is an external corporate governance mechanism for controlling and monitoring managers, safeguarding shareholders' interests and mitigating information asymmetry (Dhaliwal et al., 2012), in line with the agency approach. CSR disclosure allows companies to develop and improve their corporate image and informs their investment and financing decisions (Deegan & Blomquist, 2006). However, the fact that the reporting of information based on CSR is voluntary may encourage managers and directors to disclose the information only in accordance with their personal preferences and motivations (Healy & Palepu, 2001; Meek et al., 1995).

The premise that CSR disclosure plays a relevant role in capital structure and loans (Carroll, 1979; Spector, 2008) is argued and supported by empirical studies. Benlemlih (2017) shows the negative influence of CSR disclosure on long-term debt in American companies, reducing debt maturity. Along the same lines, Sheikh (2019) reports that CSR reporting impacts negatively on firm leverage, only when competition in product markets is high. Harjoto (2017) notes that companies with higher CSR disclosure tend to have lower levels of financial leverage. The same opinion is shared by Ye and Zhang (2011), who show that firms with extremely high CSR are subject to lower levels of debt financing costs. Ezzi et al. (2020) explain this

negative effect because firms prefer to maintain their contracts with stakeholders and, consequently, reduce capital structure and increase liquidity. Furthermore, Oware and Mallikarjunappa (2021) show that mandatory CSR reporting has a negative effect on capital structure, and a requirement for companies to report may induce some to submit inaccurate information. Furthermore, Dunne and McBrayer (2019) note that CSR disclosure reduces information asymmetries between the parties, allowing companies to reduce risk when they require finance from banks. In this regard, Gao and Connors (2011) find that environmental disclosure negatively affects leverage, since voluntary disclosure may decrease agency cost. Through the lens of an agency approach, managers tend to increase CSR disclosure in order to avoid debtholders' attention because such reporting may reduce the level of the firm's capital structure. Similarly, Desender et al. (2020) consider that CSR initiatives are aimed at generating business value and creating a sustainable competitive advantage that increase the funds available to meet debt obligations. Therefore, CSR can reduce the cost of capital structure. Authors such as Pijourlet (2015) provides evidence about how companies characterised by be more socially responsible have a lower debt ratio than firms less socially responsible, and are less dependent on market conditions for their financing decisions. Ho et al. (2021) and Saad and Belkacem (2021) state that CSR disclosure mitigates the capital structure by the importance of liquidity and the ability of the investor attention. These authors find strong evidence of a negative link between CSR disclosure and the cost of capital structure. The foregoing explains why the disclosure of more CSR information reduces the requirement of capital structure through the reduction of information asymmetries, in line with agency theory.

Following these arguments, it is expected that firms that disclose more CSR information will have lower levels of capital structure because CSR disclosure provides financial benefits such as improved firm performance or more efficient investments. These financial benefits reduce the need of additional financing such as capital structure.

Thus, we posit the following hypothesis:

**H1.** *CSR disclosure is negatively associated with the level of firms' capital structure.*

## 2.2 | The moderating role of female directors on boards

The agency approach postulates that boards of directors align the interests of managers and shareholders (Kang et al., 2007) and reduce information asymmetries (De Andres & Vallelado, 2008). In the context of an agency framework, the board composition acts as a mechanism to monitor managers and connect the firm with the external context (Carter et al., 2010). Several authors, including Carter et al. (2003), have found that female directors play an important role in the field of corporate governance because they supervise managers, reducing information asymmetries, mitigating agency problems (Carter et al., 2010) and providing better monitoring in more-developed areas (Ain et al., 2020).

Chen et al. (2016) argue that the inclusion of female directors on corporate boards provides a wider range of perspectives on the evaluation of decisions and maximisation of shareholders' wealth (Ain et al., 2020). Past research conducted by Liu et al. (2020) and Ramon-Llorens et al. (2020) reports that female directors on corporate boards encourage CSR disclosure.

Moreover, some studies have explored the role of female directors on corporate boards as a moderator. Orazalin and Baydauletov (2020) notice that CSR strategy and environmental performance are not moderated by female directors on corporate boards. These authors consider that CSR strategy is an efficient governance mechanism, which may substitute the scant representation of female directors on corporate boards. Karim (2021) reveals that female directors on corporate boards negatively moderate the association between CEO remuneration and CSR activities, since female directors have difficulties to work for the interest of the companies, due to the dominance of the counterparts' males in the decision-making process. Pucheta-Martínez et al. (2021a, 2021b) find a positive association between audit committees and CSR disclosure, relationship that is negatively moderated by board gender diversity. Thus, female directors do not support the decisions of audit committees based on the disclosure of CSR information.

Based on management, sociology and psychology approaches, female directors are generally considered to be less confident (Saeed & Sameer, 2017), more risk-averse and conservative (Byrnes et al., 1999; Man & Wong, 2013) and more ethical in their opinions (Eweje & Brunton, 2010) than males. Usman et al. (2018) find that female directors on corporate boards are weak supervisors when the board is gender diverse, since they feel under pressure.

Following this approach, a diversified board may improve its independence and bring more resources and information to the firm, which helps reduce capital structure. Furthermore, female directors are attentive, considerate and are empathetic, which is conducive to achieving good management. Zhai (2019) argues that the presence of female directors on corporate boards, with the right to speak, can influence firms' voting on decisions related to capital structure, giving greater consideration to the interests of stakeholders and even creditors. Harris (2014) argues that the inclusion of female directors on boards is considered a corporate governance factor that can influence firm outcomes and adds insight into the factors affecting the corporate financing choices of US public companies.

In summary, and following the above arguments, the presence of female directors on boards may have a moderating effect on CSR disclosure and capital structure. It can be said that the women's presence on boards may encourage transparency in companies because they are more oriented towards social and environmental issues, more sensitive and more ethical than males. However, female directors are also considered more conservative and risk-averse than their male counterparts are. Therefore, when boards including female directors agree to disclose CSR information, this will tend to reinforce decisions to reduce firms' capital structure because such decisions will increase interest payments and agency cost, assuming greater risk, which may reduce investment in CSR disclosure. As mentioned above, the

**TABLE 1** Number of observations by country

Country	Observations	Percentage	Cumulative
Argentina	7	0.09	0.09
Australia	797	10.44	10.53
Austria	65	0.85	11.38
Belgium	88	1.15	12.53
Brazil	153	2	14.54
Canada	189	2.48	17.01
Chile	27	0.35	17.37
China	14	0.18	17.55
Colombia	18	0.24	17.78
Czech Republic	1	0.01	17.8
Denmark	122	1.6	19.39
Finland	116	1.52	20.91
France	601	7.87	28.78
Germany	480	6.29	35.07
Greece	42	0.55	35.62
Hong Kong	62	0.81	36.43
Hungary	12	0.16	36.59
India	27	0.35	36.94
Indonesia	15	0.2	37.14
Ireland; Republic of	14	0.18	37.32
Israel	25	0.33	37.65
Italy	236	3.09	40.74
Japan	858	11.24	51.98
Korea; Republic (S. Korea)	15	0.2	52.17
Kuwait	3	0.04	52.21
Luxembourg	2	0.03	52.24
Malaysia	18	0.24	52.48
Mexico	35	0.46	52.93
Netherlands	178	2.33	55.26
New Zealand	100	1.31	56.57
Norway	99	1.3	57.87
Peru	8	0.1	57.98
Philippines	13	0.17	58.15
Poland	39	0.51	58.66
Portugal	48	0.63	59.28
Russia	59	0.77	60.06
Saudi Arabia	1	0.01	60.07
Singapore	46	0.6	60.67
Slovenia	1	0.01	60.69
South Africa	332	4.35	65.03
Spain	244	3.2	68.23
Sweden	210	2.75	70.98
Switzerland	172	2.25	73.23
Thailand	52	0.68	73.91
Turkey	28	0.37	74.28

(Continues)

**TABLE 1** (Continued)

Country	Observations	Percentage	Cumulative
United Arab Emirates	1	0.01	74.29
United Kingdom	948	12.41	86.71
United States of America	1.015	13.29	100
Total	7636	100	

presence of female directors on corporate boards does not moderate the association between CSR reporting and capital structure, consistent with the works presented by authors such as Orazalin and Baydauletov (2020), Karim (2021) and Pucheta-Martínez et al. (2021a, 2021b). Despite the relevant role in CSR played by female directors on boards (Liu et al., 2020; Ramon-Llorens et al., 2020), no studies have yet analysed their moderating effect on the relationship between CSR disclosure and capital structure. Thus, we hypothesise that:

**H2.** *The presence of female directors on corporate boards moderates the relationship between CSR disclosure and capital structure.*

### 3 | METHOD

#### 3.1 | Sample selection and data collection

In this research, we use a data panel sample of 10,249 international listed firm-year observations from 2007 to 2019 selected from Thomson Reuters database. This database includes information about balance sheet, income statements, financial and economical ratios, corporate governance and non-financial information. We removed some non-financial companies because not all relevant data were available. Additionally, we also deleted from the sample all financial entities because this sector is subject to different specific rules from non-financial firms, which makes comparison between the annual financial statements of both types of firms more difficult (García-Meca et al., 2017). Thus, our final sample is composed of an unbalanced panel data of 7636 listed international firm-year observations.

Firms in our sample operate in nine different industries based on the TRBC economic sector classification by Thomson Reuters and are from 48 different countries (Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Republic of Israel, Italy, Japan, Republic of Korea (S. Korea), Kuwait, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Peru, Philippines, Poland, Portugal, Russia, Saudi Arabia, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Arab Emirates, the United Kingdom and the United States). Each country in our sample is represented in Table 1. It must be noted that 13.29% of the observations are from companies located in the United States, followed by

**TABLE 2** Number of firms and observations by activity sector

Industry	Observations	Percentage	Cumulative
Basic materials	748	9.80	9.80
Consumer cyclicals	1270	16.63	26.43
Consumer non-cyclicals	987	12.93	39.36
Energy	811	10.62	49.98
Healthcare	652	8.54	58.52
Industrial	1838	24.07	82.59
Technology	360	4.71	87.30
Telecommunications	321	4.20	91.50
Utilities	649	8.50	100
Total	7636	100,00	

12.41% in the United Kingdom and 11.24% in Japan. These three countries represent the majority of the firms composing our sample.

Table 2 shows the representation in each sector: 24.07% of the companies in our sample operate in the industrial sector, 16.63% in consumer cyclical, 12.93% in non-consumer cyclical and 10.63% in energy. In contrast, the telecommunications services sector is represented by only 4.20%, the lowest proportion.

## 4 | MEASURES

### 4.1 | Dependent variable

The dependent variable is the value, as a percentage, of debt-to-equity ratio, defined as LEVERAGE and measured as total liabilities divided by total equity obtained from Thomson Reuters. This variable is in line with Reverte (2009), García-Sánchez and Martínez-Ferrero (2018) and Sheikh (2019). Other authors, such as Oware and Mallikarjunappa (2021), also use this variable in their research for listed firms on the Bombay Stock Exchange (BSE) from 2010 to 2019. Another investigation carried out by Hamrouni et al. (2019), who uses a panel data analysis of non-financial French firms listed on the Euronext Paris Stock Exchange and members of the SBF 120 index from 2010 to 2015, also constructs the leverage variable in line with our research.

### 4.2 | CSR disclosure as an explicative variable

The independent variable is CSR disclosure, defined as CSR\_SCORE, and measured as the ratio between the aggregation of 140 items focused on environmental, social and economic issues and the total number of items analysed. The measurement of this variable is consistent with Hu et al. (2018) and Gallego-Álvarez and Pucheta-Martínez (2021), who consider 100 and 123 items, respectively. If a company discloses information regarding each item, it will take the value 1; otherwise 0. To calculate this independent variable, we have built a CSR

**TABLE 3** Description variables

Variable	Description
LEVERAGE	Value in percentage of debt-to-equity-ratio = Total liabilities/Total equity
FEMALE_DIR	Percentage of female directors on boards = Total number of female directors on boards/Total number of directors on boards
CSR_SCORE	The ratio between the aggregation of 140 items focused on economic, social and environmental issues and the total number of items analysed. If the company discloses information concerning each item, it will take the value 1 and 0, otherwise
IND_MEMBERS	Percentage of independent board members = Independent members/Total board members
BOARD_SIZE	Total number of directors on boards
CSR_COM	Dummy variable: 1 = If the company has a CSR committee; 0 otherwise
SIZE	Natural logarithm of total assets
ROA	Value in percentage of return on assets ratio = Net income/Total assets
BASIC MATERIALS	Dummy variable: 1 = Basic Materials; 0 = Otherwise
CONSUMER CYCLICAL	Dummy variable: 1 = Consumer Cyclical; 0 = Otherwise
CONSUMER NON-CYCLICAL	Dummy variable: 1 = Consumer Non-Cyclical; 0 = Otherwise
ENERGY	Dummy variable: 1 = Energy; 0 = Otherwise
HEALTHCARE	Dummy variable: 1 = Healthcare; 0 = Otherwise
INDUSTRIALS	Dummy variable: 1 = Industrial; 0 = Otherwise
TECHNOLOGY	Dummy variable: 1 = Technology; 0 = Otherwise
TELECOMMUNICATION SERVICES	Dummy variable: 1 = Telecommunication Services; 0 = Otherwise

index with 140 items disclosed by the companies in the sample. According to the scoring criteria (Gallego-Álvarez & Pucheta-Martínez, 2021), we consider four ranges: when the score is 0, companies do not report CSR information; when the score is between 0.1 and 0.5 points, firms disclose moderate CSR information; when the score is between 0.6 and 0.9 points, the firm is considered socially responsible and when the score is 1 point, the disclosure of CSR information by the firm is complete.

The moderating variable used in this study is female directors on boards, labelled FEMALE\_DIR, and is calculated as the ratio between the total number of female directors on boards and the total number of directors on the board (García-Sánchez & Martínez-Ferrero, 2018; Liu et al., 2020).

**TABLE 4** Descriptive analysis

Variables	Observations	Mean	Standard deviation	p25	p50	p75
LEVERAGE	7636	181.95	129.33	84.69	145.38	247.21
FEMALE_DIR	7636	24.41	14.81	14.19	22.00	32.00
CSR_SCORE	7636	25.08	21.14	1.00	24.00	42.00
IND_MEMBERS	7636	56.57	26.01	37.50	58.33	78.57
BOARD_SIZE	7636	11.01	3.77	8.00	11.00	13.00
CSR_COM	7636	0.76	0.42	1.00	1.00	1.00
SIZE	7636	23.56	2.43	21.99	23.24	24.82
ROA	7636	4.41	8.24	2.14	4.52	7.84
BASIC MATERIALS	7636	0.10	0.30	0.00	0.00	0.00
CONSUMER CYCLICALS	7636	0.17	0.37	0.00	0.00	0.00
CONSUMER NON-CYCLICALS	7636	0.13	0.34	0.00	0.00	0.00
ENERGY	7636	0.11	0.31	0.00	0.00	0.00
HEALTHCARE	7636	0.09	0.28	0.00	0.00	0.00
INDUSTRIAL	7636	0.24	0.43	0.00	0.00	0.00
TECHNOLOGY	7636	0.05	0.21	0.00	0.00	0.00
TELECOMMUNICATIONS	7636	0.04	0.20	0.00	0.00	0.00
UTILITIES	7636	0.08	0.28	0.00	0.00	0.00

Note: Mean, standard deviation and percentile 25, 50 and 75. LEVERAGE is the ratio between the total liabilities divided by the total equity; FEMALE\_DIR is the ratio between the total number of female directors on boards divided by the total number of directors on boards; CSR\_SCORE is the ratio between the aggregation of 140 items focused on economic, social and environmental issues and the total number of items analysed. If the company discloses information concerning each item, it will take the value 1 and 0, otherwise; IND\_MEMBERS is the proportion of independent directors on boards = Total number of independent on boards/ Total number of directors on boards; BOARD\_SIZE is the total number of directors on boards; CSR\_COM is a dummy variable that takes the value 1 if the company has a CSR committee and 0, otherwise; SIZE is the natural logarithm of total assets; ROA is the operating income before interests and taxes over total assets; BASIC MATERIALS is a dummy variable: 1 = Basic Materials, 0 = Otherwise; CONSUMER CYCLICAL is a dummy variable: 1 = Consumer Cyclical, 0 = Otherwise; CONSUMER NON-CYCLICAL is a dummy variable: 1 = Consumer Non-Cyclical, 0 = Otherwise; ENERGY is a dummy variable: 1 = Energy, 0 = Otherwise; HEALTHCARE is a dummy variable: 1 = Healthcare, 0 = Otherwise; INDUSTRIALS is a dummy variable: 1 = Industrial, 0 = Otherwise; TECHNOLOGY is a dummy variable: 1 = Technology, 0 = Otherwise; TELECOMMUNICATIONS is a dummy variable: 1 = Telecommunication Services, 0 = Otherwise; UTILITIES is a dummy variable: 1 = Utilities, 0 = Otherwise. \*p-value < 0.1, \*\*p-value < 0.05, and \*\*\*p-value < 0.01.

### 4.3 | Control variables

We also consider in the analyses a set of variables to account for possible factors impacting on the level of firms' capital structure. Regarding board composition, IND\_MEMBERS is calculated as the ratio between the total number of independent directors on boards and the total number of board members (García-Sánchez & Martínez-Ferrero, 2018), while BOARD\_SIZE is measured as the total number of directors on boards (Abor, 2007). CSR\_COM is measured as a binary variable, which takes the value 1 if the firm present a CSR committee and 0 otherwise (Pucheta-Martínez & Gallego-Álvarez, 2020). SIZE represents firm size and is calculated as the natural logarithm of total assets (Liu et al., 2020). ROA represents firm profitability, measured as the ratio of total return to total assets (Pucheta-Martínez & Gallego-Álvarez, 2020). Finally, we also control for industry, using dummy variables. INDUSTRY\_DUMMIES<sub>it</sub> is a dummy variable, where <sub>i</sub> represents the different sectors of activity in which firms in the sample operate. This variable will be coded as 1 if the firm operates in the relevant sector, and 0 otherwise. We have followed the Thomson Reuters classification of sectors; the sectors used are basic materials, consumer cyclical, consumer non-

cyclical, energy, healthcare, industrials, technology, telecommunication services and utilities. Finally, we take into account the variable Year<sub>t</sub>, which is a dummy variable where t represents the years of the sample. Descriptions of all variables used in this paper are presented in Table 3.

### 4.4 | Regression model specification

We propose the following equation to check the hypotheses previously put forward:

$$\begin{aligned} \text{LEVERAGE}_{it} = & \beta_0 + \beta_1 \text{CSR\_SCORE}_{it} + \beta_2 \text{FEMALE\_DIR}_{it} \\ & + \beta_3 \text{CSR\_SCORE}_{it} \times \text{FEMALE\_DIR}_{it} + \beta_4 \text{IND\_MEMBERS}_{it} \\ & + \beta_5 \text{BOARD\_SIZE}_{it} + \beta_6 \text{CSR\_COM}_{it} + \beta_7 \text{SIZE}_{it} \\ & + \beta_8 \text{ROA}_{it} + \beta_9 \text{INDUSTRY\_DUMMIES}_{it} + \sum \beta_i \text{YEAR}_t \\ & + \eta_i + \Psi_{it}. \end{aligned}$$

This model incorporates  $\beta$ , which represents the parameters to be estimated. The firm is denoted by *i*, and *t* refers to the period. Additionally, the model includes firm-specific effects:  $\eta_i$ , which controls the



TABLE 5 Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
LEVERAGE (1)	1															
CSR_SCORE (2)	0.1763***	1														
FEMALE_DIR (3)	-0.0159	-0.0872***	1													
IND_MEMBERS (4)	0.019*	0.0346***	0.2695***	1												
BOARD_SIZE (5)	0.2204***	0.2219***	-0.0978***	-0.2379***	1											
CSR_COM (6)	0.1218***	0.2362***	-0.1051***	0.0249**	0.2494***	1										
SIZE (7)	0.1222***	0.1467***	-0.3143***	-0.2576***	0.4251***	0.2993***	1									
ROA (8)	-0.1023***	0.0333***	0.0742***	0.026**	0.0195*	0.0187	0.0607***	1								
UTILITIES (9)	0.1754***	0.0798**	-0.0575***	0.0518***	0.1002***	0.0565***	0.1099***	-0.0525***	1							
TELECOMMUNICATIONS (10)	0.0711***	-0.1357***	0.0006	-0.0039	0.0511***	0.0011	0.0468***	0.0177	-0.0638***	1						
HEALTHCARE (11)	-0.1211***	0.0237*	0.2314***	0.0858***	-0.0670***	-0.0510**	-0.0209*	0.0372***	-0.0931***	-0.0640***	1					
ENERGY (12)	-0.1005***	-0.2710***	-0.1001***	0.0723***	-0.0328***	-0.0308**	0.0215*	-0.1699***	-0.1051***	-0.0722***	-0.1053***	1				
INDUSTRIAL (13)	0.1292***	0.2119***	-0.1947***	0.0005	-0.0317***	0.0119	-0.0779***	-0.0010	-0.1716***	-0.1179***	-0.1720***	-0.1941***	1			
TECHNOLOGY (14)	-0.0698***	0.0127	-0.1085***	-0.0788***	-0.0355***	-0.0467***	0.0139	0.0179	-0.0678***	-0.0466***	-0.0680***	-0.0767***	-0.1252***	1		
BASIC MATERIALS (15)	-0.1283***	0.1224***	-0.1312***	0.0022	0.0393***	0.0700***	-0.0314***	0.0095	-0.1004***	-0.0690***	-0.1007***	-0.1136***	-0.1855***	-0.0733***	1	
CONSUMER CYCLICALS (16)	-0.0160	-0.2442***	0.2256***	-0.0804***	0.0102	-0.0426***	-0.0431***	0.0602***	-0.1361***	-0.0936***	-0.1365***	-0.1540***	-0.2515***	-0.0994***	-0.1472***	1
CONSUMER NON-CYCLICALS (17)	0.0156	0.1286***	0.1292***	-0.0422***	-0.0112	0.0228**	0.0445**	0.0728***	-0.1174***	-0.0807***	-0.1177***	-0.1328***	-0.2169***	-0.0857***	-0.1270***	-0.1721***

Note: LEVERAGE is the ratio between the total liabilities divided by the total equity; FEMALE\_DIR is the ratio between the total number of female directors on boards divided by the total number of directors on boards; CSR\_SCORE is the ratio between the aggregation of 140 items focused on economic, social and environmental issues and the total number of items analysed. If the company discloses information concerning each item, it will take the value 1 and 0, otherwise; IND\_MEMBERS is the proportion of independent directors on boards = Total number of independent directors on boards / Total number of directors on boards; BOARD\_SIZE is the total number of directors on boards; CSR\_COM is a dummy variable that takes the value 1 if the company has a CSR committee and 0, otherwise; SIZE is the natural logarithm of total assets; ROA is the operating income before interests and taxes over total assets; BASIC MATERIALS is a dummy variable: 1 = Basic Materials, 0 = Otherwise; CONSUMER CYCLICAL is a dummy variable: 1 = Consumer Cyclical, 0 = Otherwise; CONSUMER NON-CYCLICAL is a dummy variable: 1 = Consumer Non-Cyclical, 0 = Otherwise; ENERGY is a dummy variable: 1 = Energy, 0 = Otherwise; HEALTHCARE is a dummy variable: 1 = Healthcare, 0 = Otherwise; INDUSTRIALS is a dummy variable: 1 = Industrial, 0 = Otherwise; TECHNOLOGY is a dummy variable: 1 = Technology, 0 = Otherwise; TELECOMMUNICATIONS is a dummy variable: 1 = Telecommunication Services, 0 = Otherwise; UTILITIES is a dummy variable: 1 = Utilities, 0 = Otherwise. \*p-value < 0.1, \*\*p-value < 0.05 and \*\*\*p-value < 0.01.



unobservable heterogeneity that affects firms' decision-making processes, and  $\Psi_{it}$ , representing the disturbance term.

This model is estimated through the generalised method of moments (GMM) to counter endogeneity problems, unobservable heterogeneity and estimation bias. The GMM estimator applies the Wald  $\chi^2$  test, the Arellano–Bond tests AR(1) and AR(2) and the Sargan test.

## 5 | RESULTS

### 5.1 | Descriptive statistics

Table 4 presents the descriptive statistics (i.e. mean standard deviation and 25th, 50th and 75th percentiles) for all variables used in this model. We find that, on average, the leverage ratio is 181.95% (LEVERAGE) and female directors comprise, on average, 24.41% of board members (FEMALE\_DIR). The CSR\_SCORE of the international firms in our sample is 25.08% (CSR\_SCORE). According to the control variables, on average, independent directors comprise around 56.57% of board members (IND\_MEMBERS), the average board size is 11.01 members (BOARD\_SIZE) and 7.64% of companies have a CSR committee (CSR\_COM). Moreover, firm size is, on average, 23.56 (SIZE) and profitability is 4.41 (ROA). Finally, basic materials utilities (BASIC MATERIALS) account for 10% of the sample, consumer cyclical (CONSUMER CYCLICAL) and consumer non-cyclical (CONSUMER NON-CYCLICAL) represent 17% and 13% respectively, energy (ENERGY) 11%, healthcare (HEALTHCARE) 9%, industrial sector (INDUSTRIALS) 24%, technology (TECHNOLOGY) 5%, telecommunications services (TELECOMMUNICATIONS) 4% and utilities (UTILITIES) 8%.

Table 5 reports the correlation matrix. The results show a low correlation among all variables of the model: as shown, values are not high for the coefficients between the variables analysed and, thus, there are no multicollinearity problems (Archambeault & DeZoort, 2001). Additionally, we have calculated the variance inflation factor (VIF) and the value (8.03) does not exceed 10 (Greene, 1998; O'Brien, 2007), supporting our conclusion as to the lack of multicollinearity concerns.

### 5.2 | Multivariate results

Table 6 reports the main regression results for the relationship between CSR disclosure and the capital structure, and the moderating effect of female directors on corporate boards in this relationship.

In Model 1, where the effect of CSR disclosure on the level of firms' capital structure is examined, the variable CSR disclosure (CSR\_SCORE) presents a negative sign and is statistically significant. This finding is in line with our predictions and, therefore, the first hypothesis cannot be rejected. This finding supports the view that higher disclosure of CSR information by firms is negatively associated with the level of firms' capital structure. This evidence is consistent with Harjoto (2017) and Sheikh (2019), who find similar results. Firms engaged in CSR disclosure will tend to behave in a more ethical way,

**TABLE 6** Multivariate analysis results of the generalised method of moments

	MODEL 1	MODEL 2
	Coef.	Coef.
LEVERAGE <sub>t-1</sub>	0.372***	0.379***
CSR_SCORE	-0.628***	-0.413*
FEMALE_DIR		-0.276
CSR_SCORE*FEMALE_DIR		-0.006
IND_MEMBERS	-0.007	-0.026
BOARD_SIZE	-0.554	-0.912
CSR_COM	-6.826*	-7.261*
SIZE	24.121**	26.744**
ROA	-0.200	-0.322
Observations	6813	5764
Year effects	Yes	Yes
Industry effects	Yes	Yes
Wald $\chi^2$ test	39.950***	38.470***
Arellano–Bond test AR(1) ( $z, p >  z $ )	-5.107***	-4.959***
Arellano–Bond test AR(2) ( $z, p >  z $ )	-0.322	-0.134

Note: LEVERAGE is the ratio between the total liabilities divided by the total equity; FEMALE\_DIR is the ratio between the total number of female directors on boards divided by the total number of directors on boards; CSR\_SCORE is the ratio between the aggregation of 140 items focused on economic, social and environmental issues and the total number of items analysed. If the company discloses information concerning each item, it will take the value 1 and 0, otherwise; IND\_MEMBERS is the proportion of independent directors on boards = Total number of independent on boards/ Total number of directors on boards; BOARD\_SIZE is the total number of directors on boards; CSR\_COM is a dummy variable that takes the value 1 if the company has a CSR committee and 0, otherwise; SIZE is the natural logarithm of total assets; ROA is the operating income before interests and taxes over total assets; BASIC MATERIALS is a dummy variable: 1 = Basic Materials, 0 = Otherwise; CONSUMER CYCLICAL is a dummy variable: 1 = Consumer Cyclical, 0 = Otherwise; CONSUMER NON-CYCLICAL is a dummy variable: 1 = Consumer Non-Cyclical, 0 = Otherwise; ENERGY is a dummy variable: 1 = Energy, 0 = Otherwise; HEALTHCARE is a dummy variable: 1 = Healthcare, 0 = Otherwise; INDUSTRIALS is a dummy variable: 1 = Industrial, 0 = Otherwise; TECHNOLOGY is a dummy variable: 1 = Technology, 0 = Otherwise; TELECOMMUNICATIONS is a dummy variable: 1 = Telecommunication Services, 0 = Otherwise; UTILITIES is a dummy variable: 1 = Utilities, 0 = Otherwise. \*p-value < 0.1, \*\*p-value < 0.05 and \*\*\*p-value < 0.01.

which may lead them to engage with stakeholders and society and be more prudent in financial investment decisions. Firms will, rather, seek benefits by making non-financial decisions. Therefore, companies that disclose more CSR information are more likely to reduce their capital structure because, by effectively addressing CSR disclosure such as CSR disclosure, they can gain financial benefits (improved firm performance and more efficient investments) and reduce capital structure.

Model 2 examines the moderating effect of female directors on boards on the relationship between CSR disclosure and firms' capital structure. The variables CSR disclosure (CSR\_SCORE) and the presence of female directors on boards (FEMALE\_DIR) show a negative

sign. CSR\_SCORE is statistically significant ( $p < 0.01$ ), while the presence of female directors on corporate boards is not statistically significant. The interaction term between CSR disclosure and the presence of female directors on boards (CSR\_SCORE\*FEMALE\_DIR) shows a negative sign and is not statistically significant. Thus, we have to reject the second hypothesis and conclude that the association between CSR disclosure and capital structure is not moderated by board gender diversity. This evidence reveals that female directors are more conservative and risk-averse than males, which encourages transparency in companies. In this regard, our evidence shows that although female directors have a relevant influence on corporate board decisions, they do not affect the relationship between CSR disclosure and firms' capital structure, in line with the findings of Rao and Tilt (2020). In addition, a low representation of female directors on corporate boards can explain the non-moderating effect of women directors on boards on the association between CSR reporting and capital structure. That is, firms are introducing female directors on corporate boards to comply with the specific recommendations and rules of the regulatory bodies of the countries where are sit on boards, but their impact on capital structure when firms disclose CSR information is limited.

Regarding the control variables, the variables board size (BOARD\_SIZE) and profitability (ROA) show a negative sign and are not significant in either model, in line with the results obtained by Abor (2007) and Mukhibad et al. (2020), respectively. Moreover, the proportion of independent directors on boards (IND\_MEMBERS) is negative in both models and significant ( $p < 0.05$ ) in Model 1, but insignificant in Model 2. The variable CSR Committee (CSR\_COM) is negative and significant ( $p < 0.10$ ) in both models, and firm size (SIZE) is positive and significant in both models ( $p < 0.05$ ).

## 6 | CONCLUSIONS

This paper seeks to extend existing research analysing the CSR disclosure–firms' capital structure nexus by incorporating the moderating effect of female directors in the relationship. In this regard, we firstly examine how CSR disclosure affects firms' capital structure. The sample in this paper consisted of 7636 international non-financial firm-year observations in the period from 2007 to 2019.

The paper supports the premise that international companies committed to CSR disclosure tend to have less capital structure. Our findings suggest that companies are willing to focus their efforts on CSR disclosure since this reduces financial difficulties (Lee & Faff, 2009) and acts as a form of insurance for companies during adverse events (Minor & Morgan, 2011), reducing the need to increase capital structure. Moreover, the presence of female directors on corporate boards does not moderate the effect of CSR disclosure on the level of firms' capital structure. This outcome suggests a scant influence of female directors on financial decisions of companies, since female directors are proactively in favour of the disclosure of CSR information, but are more conservative and risk-averse than male directors, opposed to high-risk financial decisions such as capital structure.

The outstanding findings in this paper suggest several practical implications. First, our findings may encourage stakeholders and potential investors interested in socially responsible firms to invest in these firms, because they are less focused on financial than non-financial goals, given the reduction of the firm's capital structure when CSR information is disclosed. Furthermore, our results may be useful for managers in understanding how investors and banks respond to CSR disclosure in terms of capital structure. Third, the results obtained in this study may encourage firms to consider CSR practices, such as CSR reporting, as a part of their financial policies. In this regard, managers should consider that CSR practices have financial consequences for companies, so they must consider these effects in their financial decisions to manage more efficiently firms. Fourth, managers, shareholders and creditors should take into account that the firm's capital structure is not affected in those firms that disclose CSR information and have female directors on their boards. It seems that creditors do not view female directors on boards as a mechanism to moderate the association between CSR disclosure and capital structure. Fifth, our study focuses on non-financial companies. It could be interesting to investigate by geographic areas with different levels of market efficiency and diverse cultural and institutional characteristics, how CSR disclosure affects firms' capital structure. Sixth, this paper extends existing literature based on agency theory, which provides evidence that firms with a high level of CSR disclosure reduce agency problems by decreasing their level of capital structure. Other researchers may address or supplement this topic by focusing on other perspectives, such as stakeholder theory, signalling theory or institutional theory. These varied perspectives may provide new insights into the role of CSR disclosure in financial decisions such as capital structure policies. Finally, policy-makers should consider the combination of female directors on boards and CSR disclosure in firms, given its lack of impact on firms' capital structure. This combination will not be an efficient tool for those firms interested in reducing their capital structure, but neither will it affect those interested in increasing it.

This study has several limitations, which suggest avenues for future research. First, it is based on 7636 international firm-year observations from 48 countries from 2007 to 2019. However, we have disregarded the influence of institutional factors. For this reason, it would be interesting to examine the effect of CSR disclosure on capital structure distinguishing, for example, the national cultures in which the firms operate or the legal systems of the countries in which they are located. Second, in this study, we focus only on firms' capital structure. Future researchers may be interested in extending our research by analysing the impact of other types of voluntary disclosure on firms' capital structure.

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**How to cite this article:** Pucheta-Martínez, M. C., Bel-Oms, I., & Gallego-Álvarez, I. (2022). Corporate social responsibility reporting and capital structure: Does board gender diversity mind in such association? *Corporate Social Responsibility and Environmental Management*, 1–13. <https://doi.org/10.1002/csr.2437>