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Board gender diversity and corporate social irresponsibility in a dominant owner context

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Abstract

The growing prominence of women directors has increased interest in their role in firms' social performance. However, knowledge of what impact female directors might have on corporate social irresponsibility (CSI) remains virtually non-existent. This study aims to fill this gap. Using a sample of 107 Spanish listed non-financial companies from the OSIRIS database (Bureau Van Dijk) for the period 2014–2022, together with alternative regression methods to account for endogeneity (2SLS, propensity scoring matching and generalised method of moments), our results show an inverted U-shaped relationship between female directors and CSI. This supports arguments that dominant owners might appoint a small number of female directors symbolically to create a 'halo effect' or to enhance their public image and thus reinforce their entrenchment and divert attention away from CSI episodes. However, the appointment of a critical mass of female directors does evidence dominant owner commitment to move away from irresponsible corporate practices, since the presence of a larger number of female directors encourages the firm's ethical behaviour and increases the costs of penalising CSI episodes in the face of the firm's hypocritical behaviour. This study contributes to the emerging literature on CSI by complementing the knowledge gained from studies on ethical behaviour in a concentrated ownership setting. However, the study is not without limitations, especially in terms of the difficulty of measuring CSI episodes since, despite the work of the media, some socially irresponsible practices may remain hidden.

KEYWORDS
corporate social irresponsibility, critical mass, female directors, hypocritical conduct, reputation

1 | INTRODUCTION

Corporate social responsibility (CSR) has become an issue of particular interest to investors and managers. This growing interest has spilled over into the academic world, with a significant number of studies seeking to shed light on which elements encourage the adoption of socially responsible corporate actions and the consequences for companies of taking such decisions (Coelho et al., 2023; Fatima & Elbanna, 2023; Gillan et al., 2021; Tsang et al., 2023). Parallel to this reality, there is a dark side to corporate performance that leads

companies to stray from socially responsible conduct—corporate social irresponsibility (CSI) (Armstrong, 1977; Brammer et al., 2021; Clark et al., 2022; Cuervo-Cazurra et al., 2021; Iborra & Riera, 2023; Lin-Hi & Müller, 2013; Nardella et al., 2023). Examples of bad practices in corporate governance such as Enron or Lehman Brothers, environmental damage such as BP, ExxonMobil or Volkswagen, or inadequate working conditions such as Foxconn, Primark, Nike or H&M stand out. The literature identifies the main external drivers of CSI as being the difficulty in accessing institutional resources (Gao & Yang, 2021), the weakness of institutions (Boudier & Bensebaa, 2011; Matten & Moon, 2005, 2008; Surroca et al., 2013), institutional corruption (Keig et al., 2015) or sectoral characteristics, such as the level of competitiveness (Atay & Terpstra-Tong, 2020; Boudier & Bensebaa, 2011; Campbell, 2007). In this context, aspects linked to technological development, such as greater anonymity, lower transaction costs and less need for collateral to obtain financial resources, may spur a greater use of inappropriate corporate practices (Conrad et al., 2016; Cumming et al., 2021; Karpoff, 2021). In addition, Karpoff (2021) points to three reasons why the COVID-19 pandemic may have led to more irresponsible corporate performance, increased financial distress, commodity and product market disruptions and the destruction of human capital in firms.

Yet despite this, CSI has not received that much attention in academic circles (Lange & Washburn, 2012; Pearce & Manz, 2011; Riera & Iborra, 2017). For Clark et al. (2022), CSI is any activity or behaviour engaged in by a firm and that is intentionally intended to cause harm. For these authors, one possible reason for there being less research on CSI may be attributed to researchers' assumption that a greater knowledge of CSR helps to understand and prevent CSI. Nevertheless, as Harjoto et al. (2022) argue, naturally assuming CSI to be the flip side of CSR is a mistake. CSI is characterised by behaviour that encompasses corporate practices and behaviours which violate criminal laws, abuse human rights and that cause environmental damage and go against society's normative and ethical expectations (Alcadipani & de Oliveira Medeiros, 2020; Barnett, 2014; Carroll & Olegario, 2020; Ferry, 1962; Lange & Washburn, 2012). As a result, firms have no incentive to make CSI public, with the latter often being discovered by third parties (Aguilera et al., 2015; Dyck et al., 2010), given that episodes of CSI often lead to sanctions, fines and other negative consequences that affect company performance, including punishment and lost relationships with different stakeholders (Du et al., 2010; Strike et al., 2006). Accordingly, Harjoto et al. (2021) argue that CSI is more relevant to maintaining sustainable stakeholder relationships, whereas CSR is more relevant to building them.

In this regard, there is a need to better understand what factors might drive this irresponsible behaviour. However, there is scarce understanding of how the board—and in particular gender diversity—might affect CSI, such that research on the gender diversity–CSI relationship is in its infancy, despite the fact that female presence on boards is linked to greater ethical sensitivity (Atif et al., 2021; Cambrea et al., 2023; Chen & Dagestani, 2023; García-Sánchez, Monteiro, et al., 2023; García-Sánchez, Uribe Bohorquez, et al., 2023; Harjoto et al., 2015; Isidro & Sobral, 2015; Liao et al., 2015; Liu et al., 2020; McGuinness et al., 2017) and greater representation of different stakeholder voices (Adams & Ferreira, 2009; Cumming et al., 2015; Nadeem et al., 2017; Vitolla et al., 2020a, 2020b). Supporting these arguments, the only studies we have found that explore such a relationship are Godfrey et al. (2024) and Jain and Zaman (2020), who show a negative effect of gender diversity in CSI episodes. However, the above research focused on the gender diversity–CSI relationship in the context of US firms, that is, in a setting of widely dispersed ownership, wherein financial markets are strongly developed, the corporate governance system offers strong protection for the interests of external investors, and where minority shareholders and managers are the main actors in agency relationships (type 1 agency conflict). Yet, in most countries, investor protection by the legal system is weak, and there is a low risk of litigation and a high prevalence of ownership concentration (Djankov et al., 2008; La Porta et al., 1999). This environment shifts the main agency conflict to the potential expropriation of external investors by dominant owners—type 2 agency conflict (Dharwadkar et al., 2000; Young et al., 2008)—and endows reputation with a prominent role as a mechanism for disciplining dominant owners and managers (Cuervo, 2002; La Porta et al., 1998, 2000). Moreover, in order to understand what effect female directors have on firms' ethical behaviour, it is important to consider not only their presence but also their number (Fernández-Feijoo et al., 2014), since the impact of female directors on the company depends on their relative power, that is, their critical mass (Kanter, 1977). A lower number of women compared with men might therefore have a symbolic effect, with little or no significant impact on actual company decisions (Konrad et al., 2008; Torchia et al., 2011). Much of the knowledge about the incidence of gender diversity in CSI episodes thus remains in the shadows. In this research, we aim to answer two questions in an effort to enhance current understanding of the CSI-board gender diversity relationship: (1) How does board gender diversity in CSI episodes affect the presence of dominant owners? (2) Does the effect of female directors in CSI episodes change as their number on the board increases? Using a sample of Spanish non-financial listed companies for the period 2014–2022, we aim to fill these research gaps. The results suggest an inverted U-shaped relationship between board gender diversity and the presence of CSI episodes. This result can be explained by the fact that dominant owners may appoint a small number of female directors in a tokenistic way in order to create a 'halo effect' or to enhance their public image and so reinforce their entrenchment and divert attention away from the occurrence of CSI episodes. On the other hand, the lower presence of CSI episodes when a critical mass of female directors has been appointed may reflect the dominant owner's commitment to move away from irresponsible corporate practices, since the presence of more female directors would incentivise the firm's ethical behaviour and increase the penalty costs when CSI episodes are unearthed due to greater subsequent stakeholder punishment of the firm's hypocritical behaviour.

Our research makes several contributions. We add to the emerging literature on CSI by complementing the knowledge gained from studies into ethical behaviour in a setting of concentrated ownership,

since although the literature provides insights into the effect of dominant owners on CSR actions (Barnea & Rubin, 2010; Bona-Sánchez et al., 2023; López-Iturriaga & López-Foronda, 2011; Dam & Scholtens, 2013; Ducassy & Montandrau, 2015; Oh et al., 2017; Pucheta-Martínez & López-Zamora, 2018), the incentives of dominant owners in CSI episodes in the presence of female directors remains an unexplored aspect of their behaviour. Results obtained in the Anglo-American setting are not directly transferable to a continental European context, where female directors may play a different role in firms' social behaviour due to cultural aspects such as patriarchal attitudes, masculinity, power distance, the role of the family, tolerance of inequalities or individualism (Cabeza-García et al., 2019; Carrasco et al., 2015; Castro et al., 2023; Davis & Williamson, 2019; Grosvold et al., 2016). Moreover, in this scenario, the weaker legal system and greater orientation focused towards the interests of shareholders versus stakeholders may well affect the role of female directors and the relevance of social behaviour for dominant owners (Liu et al., 2021; Lu & Wang, 2021; Poursoleyman et al., 2024). Moreover, research on CSI episodes has focused on the consequences for companies, with less research focusing on the drivers and, to a lesser extent, on the role of female directors (Iborra & Riera, 2023). Although the literature on the incidence of women in CSR actions has grown exponentially over the last few decades (Amorelli & García-Sánchez, 2021, 2023; Atif et al., 2021; Beloskar et al., 2023; Enciso-Alfaro & García-Sánchez, 2024; Gull et al., 2023), our understanding of what effect female directors might have on the occurrence of CSI episodes remains virtually unexplored territory. As such, to the best of our knowledge, this is the first study to investigate the role of female directors in an environment of ownership concentration by considering their relative power on the board. We thus contribute to gender diversity literature by showing what role female directors play in CSI in type 2 agency conflict contexts.

2 | INSTITUTIONAL CONTEXT

Spain offers a particularly appropriate setting to explore the relationship between board gender diversity and the presence of CSI episodes. Spain was the first EU country to recommend gender quotas on the boards of listed firms and to establish incentives for firms to establish them (Spanish Corporate Governance Code-2006, Spanish SEC, *Comisión Nacional del Mercado de Valores*, CNMV 2006). However, the recommendations enjoyed limited success since, although the appointment of female directors has grown significantly, their presence is still far from what is socially acceptable. One of the main reasons might lie in the fact that Spanish regulations on gender diversity have been voluntary or 'soft', with non-compliance not leading to any sanctions. This contrasts with the 'hard' regulations adopted in countries such as Norway, France or Belgium. Achieving social legitimacy or enhancing corporate reputation is therefore cited as the main reasons why Spanish listed firms to appoint female directors (Navarro-García et al., 2022; Peña-Martel et al., 2022).

Moreover, and as in most continental European countries, the Spanish institutional setting is characterised by low investor protection, low litigation risk and a high prevalence of ownership concentration (Cuervo, 2002; Djankov et al., 2008; La Porta et al., 1999). In this context, the main agency conflict involves the possible obtainment of private benefits by dominant owners, to the detriment of the other stakeholders' interests—type 2 agency conflict (Dharwadkar et al., 2000; Young et al., 2008).

3 | THEORETICAL ARGUMENTS

Interest in CSR actions has grown exponentially due to phenomena such as globalisation, climate change and corporate scandals involving large firms, as stakeholder demands for organisations to improve their social impact have intensified (Mishra & Schmidt, 2018). In this context, firms have shown increasing interest in CSR as a source of competitive advantage that favours the firm's long-term sustainability, since integrating CSR in corporate decisions takes on a more prominent role in medium- and long-term value formation (Carroll, 2008; Narula et al., 2023; Saha et al., 2020; Zumente & Bistrova, 2021). The academic world has not remained insensitive to this reality, with a growing number of studies seeking to increase current knowledge of CSR by examining how they impact the financial behaviour or motivations of managers, dominant owners and investors in terms of using CSR information (Beloskar et al., 2023). The literature has mainly used stakeholder and legitimation theories to support its findings (Tsang et al., 2023; Velte, 2022), with the suggestion being that the 'doing well by doing good' view of Bénabou and Tirole (2010) supports the notion that firms who engage in CSR actions show better financial performance in aspects such as access to financial resources or the cost of financing (Gillan et al., 2021). Consequently, stakeholder perception is the fundamental basis of corporate reputation and, accordingly, of the firm's long-term performance and value (Harjoto et al., 2021; Pfarrer et al., 2010), especially in settings where reputation becomes a disciplining instrument for the actions of internal agents due to the weakness of the legal system in protecting the interests of external investors (La Porta et al., 2000).

In this sense, the destruction of reputational capital due to episodes of social irresponsibility affects the firm's relationship with its stakeholders, making reputational risk one of the main drivers of firm value (Becchetti et al., 2023). Consequently, the literature is beginning to show interest in situations in which maximising corporate benefit conflicts with stakeholders' interests (Alcadipani & de Oliveira Medeiros, 2020; Lange & Washburn, 2012; Riera & Iborra, 2017). Irresponsible behaviour is thus often associated with episodes that harm stakeholders (Mena et al., 2016), both intentionally and unintentionally, for example, through human rights abuses, tax evasion, environmental disasters, corruption scandals and corporate actions that harm customers and employees (Alcadipani & de Oliveira Medeiros, 2020; Barnett, 2014; Carroll & Olegario, 2020; Ferry, 1962; Lange & Washburn, 2012; Lin-Hi & Müller, 2013). Such episodes cause reputational damage (Armour et al., 2017; Harjoto et al., 2021; Lange & Washburn, 2012; Nardella et al., 2020) and can harm firms by hindering relationships with stakeholders. They are also associated with penalties and fines as well as increased financial risk and impaired

company and portfolio performance (Antonetti & Maklan, 2018; Armour et al., 2017; Becchetti et al., 2023; Berkan et al., 2021; Crifo et al., 2015; Harjoto et al., 2021; Kölbel et al., 2017; Oikonomou et al., 2012; Sun & Ding, 2021). However, in practice, firms are not always deterred from undertaking CSI actions (Barnett, 2014; Carroll & Olegario, 2020; Davis, 2021; Nardella et al., 2023; Surroca et al., 2013). Firms can thus be both 'good' and 'bad' at the same time (Clark et al., 2022; Herzig & Moon, 2013; Keig et al., 2015; Nardella et al., 2020; Strike et al., 2006). In other words, naturally considering CSI to be the flip side of CSR is a mistake (Harjoto et al., 2022). The literature identifies the main drivers of CSI as involving difficulty in accessing institutional resources (Gao & Yang, 2021), weak institutions (Boudier & Bensebaa, 2011; Matten & Moon, 2005; Matten & Moon, 2008; Surroca et al., 2013), institutional corruption (Keig et al., 2015) or sectoral characteristics such as the level of competitiveness (Atay & Terpstra-Tong, 2020; Boudier & Bensebaa, 2011; Campbell, 2007). Accordingly, in a setting such as continental Europe that is characterised by low investor protection, low litigation risk and a high prevalence of ownership concentration (Cuervo, 2002; Djankov et al., 2008; La Porta et al., 1999), dominant owners have the ability and the incentive to define firms' social behaviour (Barnea & Rubin, 2010; Bona-Sánchez et al., 2023; Dam & Scholtens, 2013; Ducassy & Montandrau, 2015; López-Iturriaga & López-de-Foronda, 2011). Two counterarguments can explain the relationship between the presence of dominant owners and the occurrence of socially irresponsible episodes. On the one hand, dominant owners may have incentives to engage in CSI episodes because they are more vulnerable to negative stakeholder evaluations (Coffey & Wang, 1998; Gomez-Mejia et al., 2011). On the other hand, the pursuit of profit maximisation or private benefits may encourage them to engage in CSI episodes (Gao & Yang, 2021). In line with these arguments, we conjecture that the presence of female directors affects the incentives of dominant owners to engage in CSI episodes and that the sign of the effect depends on the number of female directors. To the best of our knowledge, this is the first study to examine the effect of gender diversity on CSI in a setting of ownership concentration.

Previous literature has evidenced that in a wide ownership setting, the presence of female directors reduces socially irresponsible behaviour (Godfrey et al., 2024; Jain & Zaman, 2020). This result supports the argument that female directors increase supervisory capacity (Gul et al., 2008; Adams & Ferreira, 2009; Nielsen & Huse, 2010; Byron & Post, 2016; Vitolla, Raimo, Marrone, & Rubino, 2020), display more ethical behaviour and greater ethical sensitivity (Atif et al., 2021; Birindelli et al., 2018; Cambrea et al., 2023; Chen & Dagestani, 2023; Cumming et al., 2015; Enciso-Alfaro & García-Sánchez, 2024; García-Sánchez, Monteiro, et al., 2023; García-Sánchez, Uribe Bohorquez, et al., 2023; Harjoto et al., 2015; Liu et al., 2020; Nadeem et al., 2017; Samara et al., 2019; Vitolla et al., 2020a), exhibit higher risk aversion (Adams & Ferreira, 2009; Faccio et al., 2016; La Rocca et al., 2019; Schubert, 2006) and are less prone to opportunistic behaviour, fraud and criminality in the business setting (Gërxhani, 2007; Ongsakul et al., 2021; Steffensmeier & Allan, 1996; Wahid, 2019).

However, the reduction in socially irresponsible behaviour as the presence of female directors increases in the Anglo-American setting is not directly transferable to a continental European context, where female directors may play a different role in the social behaviour of firms due to cultural aspects such as patriarchal attitudes, masculinity, power distance, the role of the family, tolerance for inequalities or individualism (Cabeza-García et al., 2019; Carrasco et al., 2015; Castro et al., 2023; Davis & Williamson, 2019; Grosvold et al., 2016). Moreover, in this scenario, the weaker legal system and the greater orientation towards the interests of shareholders versus stakeholders affect the role of female directors and the relevance of social behaviour for dominant owners (Liu et al., 2021; Lu & Wang, 2021; Poursoleyman et al., 2024). In a context where ownership concentration is prevalent, dominant owners might therefore effectively control the firm and, consequently, the nomination and election of female directors (Ben-Amar et al., 2013; García-Meca & Santana-Martín, 2023). Barnea and Rubin (2010), López-Iturriaga and López-de-Foronda (2011), Dam and Scholtens (2013) and Ducassy and Montandrau (2015) find a negative impact of the presence of dominant owners on firms' socially responsible behaviour, thereby supporting the argument that these owners perceive no clear return from these actions. Dominant owners estimate that such socially responsible behaviour will lead to a reduction in the firm's short-term value or will impair their ability to obtain private benefits. They may therefore appoint a small number of female directors in order to create a 'halo or image washing effect' that promotes their positive public reputation (Baron, 2008; Malmendier & Tate, 2009; Barnea & Rubin, 2010; Bear et al., 2010; Baselga-Pascual et al., 2018; Peña-Martel et al., 2022), thereby making it easier for them to engage in episodes of CSI, since the halo effect may help them to avoid the negative attention that may arise both inside and outside the firm (Borghesi et al., 2014). In addition, the presence of a small number of female directors may have a token effect (Konrad et al., 2008; Torchia et al., 2011), reducing their ability to promote effective corporate governance, which limits the scope for CSI episodes.

Nevertheless, the presence of a critical mass of women directors could in itself be seen as a credible signal of the dominant owner's commitment to effective corporate governance that limits the scope for CSI practices. This signal could provide advantages to female directors, who are more concerned about threats to reputational capital than their male counterparts (Gilson, 1990; Godfrey et al., 2024). By reducing the risk of CSI practices, female directors promote their reputation as trustworthy supervisors, which, in turn, protects current board appointments and increases the likelihood of future ones. Moreover, in a context where reputation becomes a key factor in successfully concluding not only market-based but also relationship-based contracts (La Porta et al., 2000) and where dominant owners have reputational capital at risk, signalling the firm's commitment to improving corporate governance can also bring significant benefits to dominant owners by enhancing the firm's reputation. Moreover, based on attribution theory arguments (Lange & Washburn, 2012), stakeholders penalise CSI episodes according to prior expectations about firms' social behaviour. Consequently, firms that historically behave in a socially correct manner may be subject to higher standards of behaviour by stakeholders than those with lower social behavioural histories. Firms that engage in inconsistent behaviour—for

example by undertaking a socially responsible appointment of a high number of female directors (Baselga-Pascual et al., 2018; Bear et al., 2010; Brammer et al., 2021; Mallin & Michelon, 2011) whilst also engaging in episodes of CSI—may be seen as hypocritical and be punished more severely than firms that do not violate low stakeholder expectations. Because of perceived corporate hypocrisy (Nardella et al., 2020; Wagner et al., 2009), firms with a critical mass of female directors thus face a higher reputational cost if episodes of CSI are discovered. The above arguments allow us to state the following hypothesis:

> **Hypothesis 1.** There is an inverted U-shaped relationship between the presence of female directors and CSI episodes.

The conceptual model of the theoretical arguments is illustrated in Figure 1.

4 | RESEARCH DESIGN

4.1 | Sample and variables

To construct our sample, we consider 107 Spanish listed non-financial companies from the OSIRIS database (Bureau Van Dijk) for the period 2014–2022. Sample selection resulted in 815 firm-year observations that were used in the baseline regressions. The sample represents 97% of Spanish market capitalization in 2022. We reduce the impact of outliers on continuous variables by winsorizing at the 1st and 99th percentiles. The justification for using 2014 as the first year of the period studied is based on the coming into force of Spanish Law 31/2014, which sought to enhance the corporate governance system of listed companies as one of its main objectives.

Spain may be an interesting country in which to examine firms' unethical behaviour, since according to the 2022 Corruption Perceptions Index (Transparency International, 2023) it lies some distance from the countries that evidence least corruption—standing 38th and 16th at the global and European level, respectively. In addition, according to the World Bank, Spain ranks 48th out of 64 in 'attitudes and values' in the business setting (World Bank, 2023). Spain thus offers a particularly favourable setting in which to explore what effect the presence of female directors has on the occurrence of CSI episodes, due to the prominent presence of female directors, together with a setting that is conducive to firms behaving unethically. In this sense, the results obtained can be extrapolated to other continental European countries, as they share many of the governance, cultural and institutional characteristics found in Spanish firms.

4.1.1 | Corporate social irresponsibility

Dyck et al. (2010) show that detecting CSI actions does not depend on the usual corporate governance actors (investors, regulators and auditors). Rather, it is primarily the media that possesses the sufficient economic and reputational incentives to become involved in unearthing CSI actions, especially in major cases. In this sense, the media can play a key role in determining whether a harmful act captures our attention (Mena et al., 2016), such that the degree to which an issue resonates and is prioritised by the media will influence stakeholder perception of a company's CSR or CSI (Clark et al., 2022). In line with previous research (Berkan et al., 2021; Conyon & He, 2016; Kölbel et al., 2017; Nardella et al., 2020), we conceptualise these news items as episodes of CSI. Specifically, through the FACTIVA database, we collected news related to crime, fraud and corruption published in the main national and international media (Financial Times, Reuters, Wall Street Journal, Dow Jones, Business Wire, Expansion, El Economista and Cinco Días). In line with previous literature and in order to reduce problems of heteroscedasticity, we thus define the CSI variable as the natural logarithm one plus the number of news items related to CSI events for each firm and year.

4.1.2 | Female directors

In line with previous literature (Godfrey et al., 2024; Jain & Zaman, 2020), board gender diversity is analysed through the variable

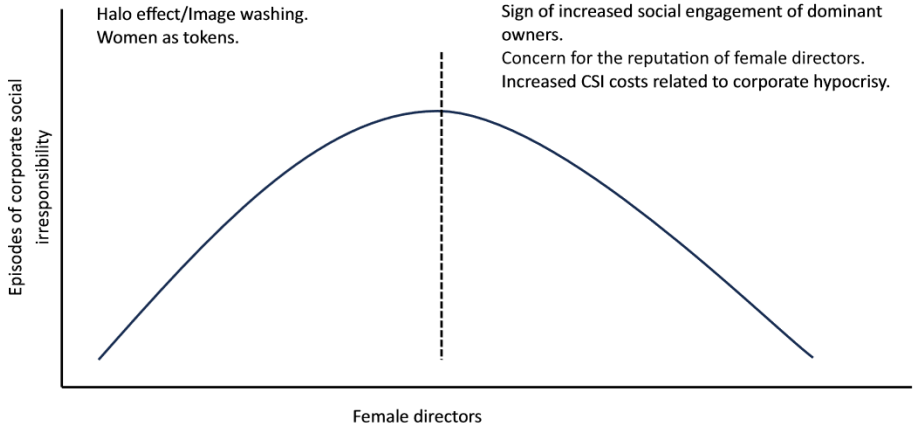

FIGURE 1 Board gender diversity and corporate social irresponsibility in a dominant owner setting. CSI, corporate social irresponsibility.

WOMEN –defined as the percentage of female directors over the total number of seats on the board. The source of information used was the Annual Corporate Governance Reports published by the Spanish SEC (Comisión Nacional del Mercado de Valores, CNMV).

4.1.3 | Control variables

The remaining variables include specific characteristics considered in previous research that are expected to determine corporate social behaviours. We thus include firm size (SIZE), since larger firms are more likely to engage in CSI episodes (Godfrey et al., 2024; Markoczy et al., 2023). We include return on assets (ROA) variable as a measure of profitability, because more profitable firms are less likely to engage in unethical actions (Gao & Yang, 2021; Markoczy et al., 2023). In addition, the literature positively relates socially responsible behaviour to the use of debt (Gong et al., 2021; Tan et al., 2020; Xu et al., 2020), such that we incorporate the level of leverage (DEBT) and estimate a negative impact on CSI episodes. On the other hand, the effect of firm age (AGE) on CSI episodes is not clear. Younger firms may have incentives to engage in irresponsible behaviour in search of resources or competitive advantage. However, such firms may be more concerned with building a good public image, which would encourage responsible practice (Withisuphakorn & Jiraporn, 2016). Moreover, we include the duality of the board's chair (PRESIDUAL) as a measure of their power that may affect the appointment of board members and their role in the firm (Fracassi & Tate, 2012). Board size (BOARD) may affect the firm's social behaviour, although the relationship may show opposite signs. Larger boards are therefore more likely to represent the interests of multiple stakeholders and to enjoy greater resources and capabilities (Coles et al., 2008; Kock et al., 2012). However, smaller boards tend to exhibit higher levels of engagement and accountability as well as better coordination and communication (Ahmed et al., 2006; Jizi et al., 2014). Previous literature has reported inconclusive results vis-à-vis how the presence of dominant owners impacts firms' social behaviour (Barnea & Rubin, 2010; Bona-Sánchez et al., 2023; López-Iturriaga & López-Foronda, 2011; Dam & Scholtens, 2013; Ducassy & Montandrau, 2015; Oh et al., 2017; Pucheta-Martínez & López-Zamora, 2018). We therefore control for the power of dominant owners through the variable VOTING. Additionally, we considered the firm's socially responsible behaviour (ESG), expecting firms that are characterised by more socially responsible behaviour to be less likely to engage in CSI episodes (Markoczy et al., 2023). Finally, we included industry and year dummy variables. All variables are defined in the Appendix A: Table A1.

4.2 | Model specification and estimation

Three different analyses are used to carry out the estimations. First, we use an instrumental variables approach—specifically, two-stage least squares (2SLS)—as it can be useful to eliminate endogeneity bias coefficients (Baum et al., 2011; Chen et al., 2017). As instrumental variables, we use the variable MALE_WOMEN, measured as the fraction of directors who are on other boards where there is at least one female director (Adams & Ferreira, 2009; Chen et al., 2017; Levi et al., 2014). The more connected a firm's directors are to female members of other boards, the more female directors should be on the firm's board, suggesting a positive relationship between this instrumental variable and the proportion of female directors. In addition, we use the firm's presence in the main Spanish stock market index (IBEX35), since firms that are part of the main stock market indices are subject to greater investor and media scrutiny, which encourages the appointment of female directors (Peña-Martel et al., 2022). The system of simultaneous equations is as follows:

$$\begin{aligned}\text{WOMEN\_Estimated}_{i,t} = {} & \alpha + \beta_1\,\text{MALE\_WOMEN}_{i,t} + \beta_2\,\text{IBEX35}_{i,t} \\ & + \gamma\text{Control\_variables}_{i,t} + \text{Industry}_i \\ & + \text{Year}_t + \varepsilon_{i,t}.\end{aligned} \quad (1)$$

$$\begin{aligned}\text{CSI}_{i,t} = {} & \alpha + \beta_1\,\text{WOMEN\_Estimated}_{i,t} + \beta_2\,\text{WOMEN\_Estimated}^2_{i,t} \\ & + \gamma\text{Control\_variables}_{i,t} + \text{Industry}_i + \text{Year}_t + \varepsilon_{i,t}.\end{aligned} \quad (2)$$

In addition, in order to reinforce the integrity of the analysis, we conduct an alternative estimation method that considers the problem of endogeneity. We run CSI analysis using a regression framework that employs a propensity score matching (PSM) sample to ensure that our treatment group is comparable to the benchmark group in observable covariates based on the nearest neighbour. We therefore employ PSM to match observations of firms with female directors to observations of firms with no female directors, based on observable firm characteristics. We use this procedure in an attempt to control for differences in characteristics between firms with and without female directors and to address potential selection bias. To calculate the propensity score, we consider the firm characteristics that should capture the likelihood of a given firm having female directors on the board. We specifically considered VOTING, MALE_WOMEN and IBEX35 (Adams & Ferreira, 2009; Chen et al., 2017; Levi et al., 2014; Peña-Martel et al., 2022). We show the PSM balance test in the Appendix A: Table A2.

Finally, we employ the generalised method of moments (GMM) developed by Blundell and Bond (1998). This technique allows us to address potential endogeneity problems arising from the simultaneity between gender diversity and CSI, as well as from uncontrolled individual heterogeneity. This creates problems arising from the omission of unobservable firm characteristics, which could affect the appointment of female directors. For example, female appointments might be influenced by exogenous features, which in turn influence CSI, such that the association between female directors and CSI might be spurious.

We therefore estimate the following empirical model:

$$\begin{aligned}\text{CSI}_{i,t} = {} & \alpha + \beta_1\text{WOMEN}_{i,t} + \beta_2\text{WOMEN}^2_{i,t} + \gamma\text{Control\_variables}_{i,t} \\ & + \text{Industry}_i + \text{Year}_t + \varepsilon_{i,t}.\end{aligned}$$

5 | RESULTS

5.1 | Sample distribution

To commence the analysis, we show how the main variables evolve. Figure 2 shows the evolution of the percentage of firms involved in at least one episode of CSI. This evidences an increasing trend, since while one in five firms committed at least one unethical act in 2014, this proportion rose to around one in three in 2022. Moreover, the data reflect an upturn in socially irresponsible companies since the COVID crisis, in line with Karpoff's (2021) arguments.

Figure 3 shows an irregular behaviour of the average number of CSI episodes by the firms in the sample. However, the same increase can be seen from 2020 onwards, as mentioned above in the number of firms exhibiting unethical behaviour.

As regards the presence of female directors, Figure 4 shows an increase in the number of firms with at least one woman on the board, such that by 2020, almost all firms have at least one female director. This positive trend is reflected in the prominence of female directors since, whereas female directors held around 20% of seats in 2014, by 2022 this had risen to 30%.

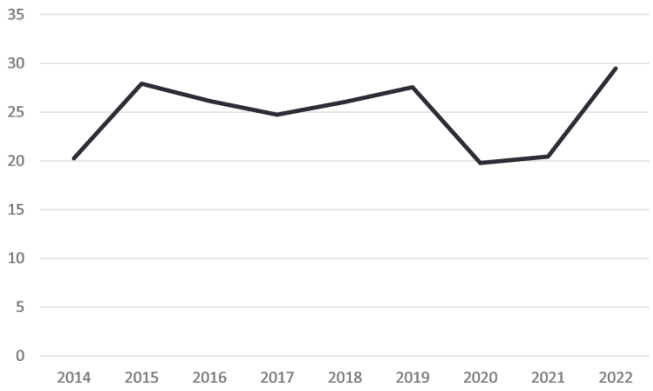

FIGURE 2 Companies engaged in episodes of corporate social irresponsibility (%).

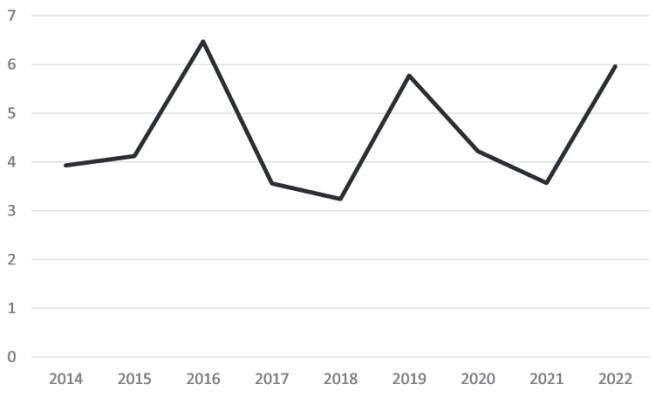

FIGURE 3 Mean number of episodes of corporate social irresponsibility (calculated considering companies that engage in at least one episode of social irresponsibility).

5.2 | Descriptive statistics

Table 1 shows the descriptive statistics for all variables. Panel A summarizes the descriptive statistics of the variables used in the estimation models. In Panel B, the correlation matrix of all the variables is presented. Given that the correlation between the main variables of interest is low, multicollinearity is unlikely to be the cause of our regression results, and the low variance inflation factor values seem to confirm this (Studenmund, 1997).

In addition, a mean difference analysis was conducted to initially study the relationship between board gender diversity and CSI. Companies were divided into subsamples according to whether or not they appointed women to their board of directors (Panel C, Table 1). Data show that firms with female directors are more socially irresponsible, larger, more profitable, have a higher ESG score, boards with more seats and are less in debt. However, there are no significant differences in terms of president duality or age.

5.3 | Board gender diversity and CSI

Table 2 shows the results of the estimates of the incidence of gender diversity on the occurrence of CSI episodes. Models 1, 2 and 3 use 2SLS, PSM and GMM, respectively, with similar results. In this sense, the results support the Hypothesis 1 stated above, that is, the existence of an inverted U-shaped relationship between the presence of female directors and the number of CSI episodes. The presence of female directors has a positive impact on the unethical behaviour of firms up to a turning point, after which their effect on socially irresponsible behaviour is negative. This turning point is reached when female directors occupy approximately one third of board seats. Bearing in mind that the average board size of the firms in the sample is ten, having at least three female directors is when their impact on firms' unethical behaviour turns from positive to negative.

As regards the control variables, the results indicate that the size of the firm and its age have a positive impact on the occurrence of CSI episodes. In contrast, the level of indebtedness, socially responsible actions and the size of the board have a negative impact on firms' unethical behaviour. Finally, company profitability, the dual role of the

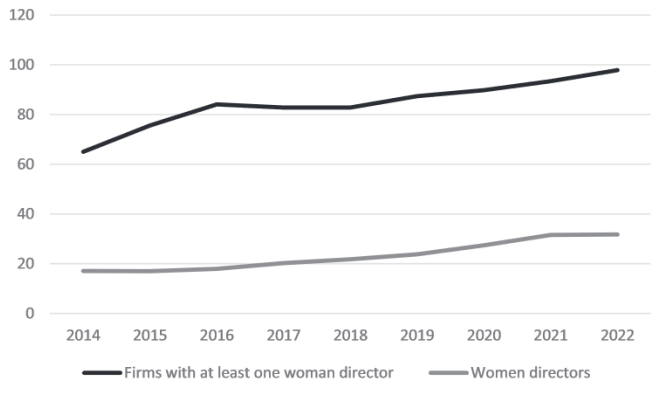

FIGURE 4 Women directors.

TABLE 1 Descriptive statistics.

Panel A. Summary statistics					
	Mean	Median	SD	1Q	3Q
CSI[a]	4.63	3.00	5.49	1.00	6.00
WOMEN[b]	23.88	23.07	11.62	14.28	33.33
SIZE	14.04	13.99	2.08	12.52	15.32
ROA	5.75	5.21	11.61	2.37	8.95
DEBT	67.16	66.66	28.55	48.49	81.39
ESG	3.59	3.52	0.35	3.29	3.91
PRESIDUAL	0.52	1.00	0.49	0.00	1.00
AGE	3.73	3.80	0.71	3.29	4.30
BOARD	2.26	2.30	0.32	2.07	2.48
VOTING	34.84	28.99	23.94	14.87	52.93

Panel B. Correlation matrix										
	CSI	WOMEN	SIZE	ROA	DEBT	ESG	PRESIDUAL	AGE	BOARD	VIF
WOMEN	0.04									
SIZE	0.422***	0.220***								2.95
ROA	−0.07**	−0.024	−0.030							1.07
DEBT	0.175***	−0.042	0.080**	−0.242***						1.09
ESG	−0.273***	0.191***	0.837***	−0.025	0.009					2.52
PRESIDUAL	0.063*	−0.044	0.023	0.083**	0.005	0.052				1.03
AGE	0.207***	−0.053	0.093***	−0.042	0.101***	0.052	0.040			1.09
BOARD	0.252***	0.659***	0.659***	0.003	0.003	0.619***	0.034	0.172***		2.00
VOTING	−0.103***	−0.094***	−0.157***	−0.013	0.017	−0.166***	−0.126***	−0.220***	−0.304***	1.17

Panel C. Firms with and without women directors							
	With women directors, $N = 704$			Without women directors, $N = 111$			
	Mean	Median	SD	Mean	Median	SD	*t*-Student
CSI[a]	4.72	3.00	5.61	3.16	2.50	2.65	2.74***
SIZE	14.27	14.32	2.08	12.65	12.47	1.51	7.93***
ROA	6.12	5.39	11.13	3.42	4.14	14.15	2.29**
DEBT	66.15	65.92	28.32	73.34	73.40	27.68	−2.50**
ESG	3.62	3.55	0.35	3.37	3.29	0.22	7.37***
PRESIDUAL	0.51	1.00	0.50	0.55	1.00	0.49	0.73
AGE	3.72	3.78	0.72	3.74	3.86	0.65	0.26
BOARD	2.30	2.30	0.30	1.99	1.94	0.33	9.69***
VOTING	33.23	26.70	23.13	43.52	38.54	26.91	−4.24***

Note: *, ** and *** indicate significant at 10%, 5% and 1%, respectively.
Abbreviations: CSI, corporate social irresponsibility; ROA, return on assets; VIF, variance inflation factor.
[a]Statistics calculated considering companies that perform at least one episode of CSI.
[b]Statistics calculated considering companies that appoint at least one woman as a board member.

board president and the level of voting rights held by the main shareholder have no statistically significant impact on the occurrence of CSI episodes.

5.4 | Robustness analysis

In order to endow the results with greater robustness, we carried out different analyses to give greater consistency to the conclusions reached. First, we consider different samples of firms, in line with arguments that identify aspects such as difficulty accessing resources (Gao & Yang, 2021). In Model 4 (Table 3), we therefore analyse firms characterised by high bankruptcy risk, using Altman's *Z*-score[1]

[1]A firm is at risk of bankruptcy if its *Z*-score is ≤1.81. The Altman *Z*-score is calculated as $1.2A + 1.4B + 3.3C + 0.6D + 1.0E$, where A is working capital divided by total assets, B is retained earnings divided by total assets, C is earnings before interest and taxes divided by total assets, D is market value of equity divided by total liabilities and E is sales divided by total assets.

TABLE 2 Board gender diversity and corporate social irresponsibility.

Dependent variable	CSI		
	Model 1	Model 2	Model 3
Estimation models	2SLS	PMS	GMM
WOMEN	0.884** (2.28)	0.071** (2.20)	0.027*** (4.89)
$WOMEN^2$	−0.014** (−2.34)	−0.001** (−2.04)	−0.0004*** (−4.93)
SIZE	1.017*** (6.28)	0.941*** (5.27)	0.287 (0.68)
ROA	−0.002 (−1.28)	−0.009 (−0.77)	0.001 (0.66)
DEBT	−0.003 (−1.19)	−0.004** (−2.02)	−0.003 (−0.46)
ESG	−5.125*** (−3.57)	−1.546 (−1.09)	−1.773*** (−4.97)
PRESIDUAL	0.211 (0.55)	0.296 (0.74)	0.005 (0.70)
AGE	0.844*** (3.39)	0.245 (0.80)	1.059*** (5.84)
BOARD	−1.649* (−1.79)	−0.676 (−1.00)	−0.871*** (−4.48)
VOTING	0.013 (1.25)	0.004 (0.54)	0.002 (1.03)
Constant	−8.978 (−0.39)	−6.948* (−1.77)	−8.337*** (−6.10)
Industry effect	Yes	Yes	Yes
Year effect	Yes	Yes	Yes
F-test	5.33***	4.10***	7646.81***
LM-statistic	8.64***		
Sargan test	2.271		
M^2			−1.53
Hansen test			73.79
Z^1			47.92***
Z^2			79.30***
Z^3			61.23***
No. of observations	815	222	815

Note: *, ** and *** indicate significant at 10%, 5% and 1%, respectively. Abbreviations: 2SLS, two-stage least squares; CSI, corporate social irresponsibility; GMM, generalised method of moments; ROA, return on assets.

(Altman, 1968). The results support those obtained above. However, the turning point of the inverted U-shaped relationship is reduced to 25% of female directors. This finding seems to show that in firms which experience greater economic difficulties, the importance of achieving or maintaining a good reputation is more prominent, which means that fewer female directors are required in order to have a negative impact on CSI.

Hoobler et al. (2018) argue that research into women's impact on firm performance should go beyond diversity and address the impact of female leadership. In this regard, women may display different capabilities and incentives depending on their affiliation to the firm, which may lead to different effects on organisational performance (Herdhayinta et al., 2021; Navarro-García et al., 2022; Poletti-Hughes & Briano-Turrent, 2019). As a result, we classified female directors according to whether they play a managerial role, and in terms of their tenure as board members. Models 5 and 6 examine the effect of external female directors and executive female directors, respectively, on CSI episodes. In both cases, the non-linear inverted U-shaped relationship is shown, although the inflection points differ—30% for female outside directors and 25% for female executive directors. This difference is in accordance with the greater power over corporate social behaviour exerted by female directors who play an executive role in the firm. Along these lines, Models 7 and 8 analyse the role of rookie directors, that is, those who have been directors for less than three years, and veteran directors, respectively. The results support the previous ones, although again we find differences in the turning points of the non-linear relationship. The turning point for novice female directors is 30%, whereas for veteran female directors, it is 25%. This result indicates that seniority impacts the influence of female directors on firms' unethical behaviour.

Previous literature shows that the COVID-19 pandemic has led to less gender diversity on boards (García-Sánchez, Uribe Bohorquez, et al., 2023), while increasing the incentives of female directors to positively affect firms' social behaviour (Amorelli & García-Sánchez, 2023). However, we do not know the impact of the presence of female directors on socially irresponsible behaviour in a pandemic context where firms may have incentives to engage in CSI episodes due to increased financial distress, disruptions in commodity and product markets and the destruction of human capital in firms (Karpoff, 2021). In Table 4, we therefore analyse the role of female directors in CSI in the context of the COVID-19 pandemic. Accordingly, we define COVID as a dichotomous variable that takes the value 1 in the year 2020, and 0 otherwise. We run the regressions for the total sample (Model 9) and—following Amorelli and García-Sánchez (2023)—we consider firms in financial distress using the Altman *Z*-score (Model 10). The results obtained in both models concur with previous studies, indicating that in a context of crisis, firms increase their incentives to engage in episodes of social irresponsibility and that, in this setting, the presence of female directors reduces socially irresponsible behaviour.

6 | DISCUSSION AND CONCLUSIONS

The literature focusing on the drivers of CSI episodes is still scarce (Iborra & Riera, 2023), and current knowledge of what impact board gender diversity has on firms' unethical behaviour is still in its infancy, with the exception of the studies by Jain and Zaman (2020) and Godfrey et al. (2024), who show a negative impact of the presence of female directors on the occurrence of CSI episodes. However, their results are not conclusive and cannot be extrapolated for at least two reasons: first, their research is conducted in a setting characterised by

TABLE 3 Board gender diversity and corporate social irresponsibility: GMM, robustness.

	CSI				
Dependent variable	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
WOMEN	0.047*** (4.97)				
WOMEN^2	−0.001*** (−5.49)				
WOMEN_EXT		1.059*** (7.71)			
WOMEN_EXT^2		−0.017*** (−5.10)			
WOMEN_EXEC			0.414*** (3.02)		
WOMEN_EXEC^2			−0.008*** (−3.02)		
WOMEN_ROOKIE				0.031*** (2.90)	
WOMEN_ROOKIE^2				−0.0005** (−2.11)	
WOMEN_SENIOR					0.050*** (3.87)
WOMEN_SENIOR^2					−0.001*** (−5.81)
SIZE	1.205*** (8.42)	0.654*** (7.57)	0.029 (1.27)	0.766*** (11.72)	0.768*** (9.76)
ROA	−0.0004** (−2.34)	−0.031*** (−8.31)	−0.015*** (−6.73)	−0.029*** (−10.15)	−0.023*** (−5.45)
DEBT	−0.003*** (−6.02)	−0.002 (−0.10)	−0.008*** (−5.03)	−0.002*** (−5.49)	−0.001*** (−4.60)
EDAD	1.423*** (5.41)	1.367*** (4.23)	0.420*** (4.35)	0.767*** (7.03)	0.832*** (5.68)
ESG	−1.573*** (−2.81)	−1.654*** (−4.80)	−0.820 (−1.03)	−0.030 (−0.60)	−0.740 (−1.58)
PRESIDUAL	0.051 (0.20)	0.247* (1.70)	0.222** (2.20)	0.545*** (4.06)	0.190 (1.49)
BOARD	−2.708*** (−9.94)	−0.709** (−2.27)	0.127 (0.29)	−1.878*** (−6.46)	−1.012*** (−3.40)
VOTING	−0.013*** (−3.25)	−0.015*** (−5.91)	0.003 (0.21)	−0.005* (−1.71)	−0.001 (−0.81)
Constant	−8.901*** (−5.62)	−7.414*** (−3.33)		−9.211*** (−5.60)	−8.478*** (−5.57)
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
F-test	377.21***	1110.06***	2570.07***	570.88***	279.55***
M^2	−1.58	−2.16	−1.20	−1.18	−1.21
Hansen test	56.00	59.68	45.86	63.30	62.64
Z^1	24.24***	27.55***	107.85***	56.28***	43.26***
Z^2	10.75***	18.27***	218.98***	8.74***	7.99***
Z^3	31.18	56.23***	29.85***	44.87***	24.66***
No. of observations	534	815	815	815	815

Abbreviations: CSI, corporate social irresponsibility; GMM, generalised method of moments; ROA, return on assets.

Note: *, ** and *** indicate significant at 10%, 5% and 1%, respectively.

TABLE 4 Board gender diversity and corporate social irresponsibility: GMM, robustness, COVID-19 effect.

	CSI	
Dependent variable	**Model 9**	**Model 10**
WOMEN	−0.027* (−1.74)	−0.031*** (−4.29)
COVID	1.603** (2.16)	1.342*** (2.74)
WOMEN × COVID	−0.055* (−1.90)	−0.046** (−2.66)
SIZE	0.654*** (5.15)	0.693*** (7.53)
ROA	−0.047*** (−6.95)	−0.036** (−2.23)
DEBT	0.008** (2.55)	0.003 (0.35)
AGE	−0.385** (−2.42)	−0.102 (−0.51)
ESG	−2.889*** (−3.31)	−2.866*** (−3.07)
PRESIDUAL	−0.318 (−1.30)	−0.600*** (−3.91)
BOARD	1.364* (1.81)	0.964 (1.24)
VOTING	−0.014*** (−3.40)	−0.012*** (−2.81)
Constant	1.005 (0.59)	0.269 (0.16)
Industry effect	Yes	Yes
Year effect	Yes	Yes
F-test	479.96***	3682.92***
M^2	−1.53	−1.48
Hansen test	20.42	20.1
Z^1	9.12***	100.29***
Z^2	2.17**	15.83***
Z^3	4.93***	7.97***
No. of observations	815	534

Note: *, ** and *** indicate significant at 10%, 5% and 1%, respectively. Abbreviations: CSI, corporate social irresponsibility; GMM, generalised method of moments; ROA, return on assets.

strong legal protection of stakeholders' interests, the presence of developed financial markets and widely dispersed ownership structures; second, because they do not consider female directors' relative power in firms' social behaviour, that is, the presence of a critical mass of women on the board. These factors limit any transferability of their results to environments where the presence of dominant owners with the incentives and the capacity to influence firms' social behaviour is common, and where legal institutions and markets are less effective as instruments for disciplining insiders. In a continental European context, female directors may therefore play a different role in firms' social behaviour due to cultural aspects such as patriarchal attitudes, masculinity, power distance, the role of the family, tolerance for inequalities or individualism. In addition, in this setting, the greater orientation towards the interests of shareholders versus stakeholders is seen to affect the role of female directors and the relevance of social behaviour for dominant owners. We thus aim to fill this gap by looking at what role female directors play in the unethical behaviour of firms in a setting of ownership concentration.

Our results show a non-linear inverted U-shaped relationship between the presence of female directors and firms' unethical behaviour. This result suggests that the presence of a small number of female directors encourages owners to engage in CSI episodes, using female directors as tokens to create a halo effect that promotes a positive public image among stakeholders (Baron, 2008; Malmendier & Tate, 2009; Barnea & Rubin, 2010; Bear et al., 2010; Baselga-Pascual et al., 2018; Peña-Martel et al., 2022). Moreover, a small number of female directors would lack sufficient capacity to influence the firm's social behaviour, which would primarily be defined by the interests and incentives of the dominant owner. However, the presence of more female directors signals the dominant owner's commitment to effective corporate governance that limits the scope for CSI practices. This signal could provide advantages for female directors, who are more concerned about threats to reputational capital than their male counterparts (Gilson, 1990; Godfrey et al., 2024). By reducing episodes of CSI, female directors boost their reputation as trustworthy supervisors, which, in turn, protects current board appointments and increases the likelihood of future ones. Moreover, in a context where reputation becomes a key factor in successfully concluding not only market-based but also relationship-based contracts (La Porta et al., 2000) and where dominant owners have reputational capital at risk, signalling the firm's commitment to improve corporate governance can also bring significant benefits to dominant owners by enhancing the firm's reputation. Additionally, the negative impact of a high number of female directors on unethical behaviour in firms is in line with the arguments of attribution theory (Lange & Washburn, 2012), as stakeholder punishment for engaging in episodes of CSI would be greater in 'hypocritical' firms that undertake inconsistent action (Nardella et al., 2020; Wagner et al., 2009), that is, a high presence of female directors coupled with unethical behaviour (Baselga-Pascual et al., 2018; Bear et al., 2010; Brammer et al., 2021; Mallin & Michelon, 2011).

Furthermore, the results indicate that the turning point of the inverted U-shaped relationship is found when female directors occupy around one third of board seats, in other words when three female directors have been appointed—considering the average board size of firms in the sample. This result aligns with studies by Fernández-Feijoo et al. (2014), Ben-Amar et al. (2013) and Liu (2018) who show positive company social performance based on the presence of a critical mass of at least three female directors. In addition, the results indicate that this turning point is reduced by firms' greater need for resources and by the characteristics of female directors related to their power on the board. In companies that face greater economic difficulties, the turning point is thus reduced to around two female directors. This result suggests that in firms where a good reputation is

particularly critical, fewer female directors are needed to reduce companies' unethical behaviour, thereby reflecting a greater concern on the part of the dominant owner to signal their commitment to socially just conduct as a source of the firm's sustainability. The similar result occurs when considering female directors with more power on the board, either because of their executive nature or because of their seniority as board members. Firms' unethical behaviour is therefore not only determined by board diversity but also by the power that female directors can wield.

Our study offers theoretical contributions to the literature focusing on firms' social conduct. First, we help to further current knowledge centred on CSI and, specifically, on current understanding of the corporate drivers underlying firms' socially irresponsible behaviour—an area of research that has so far been scarcely explored (Iborra & Riera, 2023). Second, we provide evidence that female directors influence firms' unethical behaviour in a setting of ownership concentration. The results show that—in the presence of dominant owners—female directors play a different role in the social conduct of firms to the one they play in an Anglo-American setting. Third, we add evidence to the limited existing literature (Godfrey et al., 2024; Jain & Zaman, 2020) concerning the importance of considering the effects of a critical mass of female directors on firms' unethical behaviour. In so doing, we bring to light the presence of non-linear relationships between gender diversity and CSI episodes, in line with studies that show the relevance of a circular mass of female directors on firms' social behaviour (Fernández-Feijoo et al., 2014; Ben-Amar et al., 2013; Liu, 2018). Finally, we note that the impact of female directors on socially irresponsible behaviour depends not only on their number but also on factors such as the greater difficulty for the firm's sustainability or the power that female directors can exert on the board's actions. From a practical perspective, the study's findings suggest that policymakers, regulators and investors alike should encourage the presence of a critical mass of female directors in order to reduce unethical behaviour in firms. In addition, the results suggest that social irresponsibility can be reduced not only by establishing gender quotas, but also by encouraging aspects such as the appointment of female directors as managers or by reducing female director turnover as board members. From a longer-term perspective, institutions should encourage more inclusive education so that a critical mass of female directors does not need to be reached in order to reduce socially irresponsible behaviour by firms. Investing in female empowerment and a culture that promotes equal opportunities can be socially beneficial, as it would reduce inappropriate behaviour by firms.

The study is not without its limitations, especially in terms of the difficulty involved in measuring CSI episodes since, despite the work of the media, some socially irresponsible practices may remain hidden. However, the results obtained do pave the way for further research exploring the effect of gender diversity on firms' irresponsible behaviour. It might be interesting to look at the relationship between women directors-CSI in family firms by studying the role of women with and without affiliation to the dominant family. In addition, it could be interesting to examine the role of women in terms of their position on the board, for example, as chair or vice-chair, and their role in the different board committees. It could also prove enlightening to study the role of female directors, taking into account aspects such as their length of service in the firm, their shareholding, their education and their qualifications. Furthermore, it might be interesting to extend the study to an international sample in order to look at how different cultural, legislative and institutional factors affect the relationship between board gender diversity and the socially irresponsible behaviour of firms.

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APPENDIX A

TABLE A1 Definitions of variables.

Measure of corporate social irresponsibility	
CSI	Natural logarithm of the number of news items related to CSI events for each company and year. Specifically, through the FACTIVA database, we collected news related to crime, fraud and corruption published in the main national and international media (Financial Times, Reuters, Wall Street Journal, Dow Jones, Business Wire, Expansion, El Economista and Cinco Días).
Measures of board gender diversity	
WOMEN	Percentage of female directors divided by the total number of directors.
WOMEN_EXT	Percentage of non-executive female directors divided by the total number of directors.
WOMEN_EXEC	Percentage of executive female directors divided by the total number of directors.
WOMEN_ROOKIE	Percentage of female directors with less than three years on the board divided by the total number of directors.
WOMEN_SENIOR	Percentage of female directors with more than three years on the board divided by the total number of directors.
Control variables	
AGE	Natural logarithm of one plus the number of years since the firm's incorporation.
VOTING	Voting rights of the largest owner of the firm.
BOARD	Natural logarithm of the number of directors.
SIZE	Natural logarithm of assets.
ROA	Return on assets, computed as earnings before interest, taxes, depreciation and amortization divided by total assets.
DEBT	The sum of short- and long-term debt divided by total assets.
PRESIDUAL	Dummy variable that equals one if the CEO is the chair of the board, and 0 otherwise.
ESG	Natural logarithm of ESG score by Moody´s, collected from Orbis database.
Setting variable	
COVID	Dummy variable that takes the value 1 in the year 2020, and 0 otherwise.
Instrumental variables	
MALE_WOMEN	The fraction of male directors on the board who sit on other boards with at least one female director.
IBEX35	Dummy variable that takes a value of 1 if the company is part of the representative index of the Spanish stock market (IBEX-35), and 0 otherwise.

Abbreviations: CSI, corporate social irresponsibility; ROA, return on assets.

TABLE A2 Propensity score matching (PSM) balance test.

		Treated	Controls	Difference	SE	*t*-Student
SIZE	Unmatched	14.311	12.644	1.666	0.207	8.05***
	Matched	14.311	14.069	0.242	0.417	0.58
ROA	Unmatched	6.324	3.469	2.855	1.193	2.39**
	Matched	6.324	5.358	0.966	3.470	0.28
DEBT	Unmatched	66.254	73.317	−7.063	2.871	−2.46**
	Matched	66.254	71.349	−5.095	5.552	−0.92
ESG	Unmatched	3.633	3.378	0.258	0.034	7.42***
	Matched	3.633	3.619	0.013	0.064	0.21
PRESIDUAL	Unmatched	0.526	0.563	−0.036	0.051	−0.72
	Matched	0.526	0.716	−0.189	0.118	−1.51
AGE	Unmatched	3.749	3.747	0.001	0.070	0.02
	Matched	3.749	3.808	−0.059	0.159	−0.37
BOARD	Unmatched	2.308	1.997	0.311	0.031	9.78***
	Matched	2.308	2.191	0.116	0.085	1.37
VOTING	Unmatched	33.059	43.529	−10.469	2.442	−4.29***
	Matched	33.059	40.796	−7.736	6.973	−1.11

Abbreviation: ROA, return on assets.