

RESEARCH ARTICLE

Gender diversity, inclusive innovation and firm performance

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Abstract

This study delves into intra-organizational dimensions that might impact inclusive innovation. Based on the expectation states theory, we explore how gender diversity in management positions and on the board of directors affects inclusive innovation. Furthermore, drawing on the signaling theory, we examine the relationship between inclusive innovation and a firm's performance. Using a comprehensive panel data of European manufacturing companies for a period of 10 years, we provide evidence that gender diversity in management positions and the presence of at least one woman on the board of directors have a positive effect on inclusive innovation. Our results also reveal the economic value of such strategy, showing that inclusive innovation positively influences performance. Implications for theory and managerial practice are discussed.

KEYWORDS

expectation states theory, feminist perspective, firm performance, gender diversity, inclusive innovation, signaling theory

1 | INTRODUCTION

This study is aimed at exploring how gender diversity in management positions and on the board of directors affects inclusive innovation developed by firms. Inclusive innovation (Zaefarian et al., 2015), also called “bottom-of-the-pyramid innovation,” can be understood as “the development and implementation of new ideas which aspire to create opportunities that enhance social and economic wellbeing for disenfranchised members of society” (George et al., 2012). Inclusive innovation aims to alleviate poverty in economically feasible ways (Halme et al., 2012) through the development of new products for low-income population segments. By applying business logic in bottom-of-the-pyramid markets, companies may be able to reduce

poverty and improve business opportunities and revenue streams (Ansari et al., 2012). Since the outbreak of the COVID-19 pandemic, global poverty has become one of the most concerning topics (Zhao et al., 2022). According to global poverty indicators estimated by the World Bank Group, although for three decades extreme poverty was declining, the pandemic interrupted this trend. The health crisis and, more recently, high inflation and the war in the Ukraine might increase the number of people living in extreme poverty by 70–95 million (Mahler et al., 2022; The World Bank Group, 2022). Consequently, inclusive innovation represents a timely and necessary strategy that might help reduce poverty, since it is considered to be a means to achieve a more inclusive, equitable and sustainable development (Levidow & Papaioannou, 2018). In fact, inclusive innovation is

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critical for poverty eradication, one of the SDGs which has been identified as essential for achieving sustainability (Zhao et al., 2022).

Bottom-of-the-pyramid innovation remains relatively underexplored (Rawhouser et al., 2019). Most of the research on these topics are conceptual articles or empirical studies carried out through qualitative methodologies (Woodson et al., 2019; Zaefarian et al., 2015). Few studies examine the key drivers and outcomes of social strategies at the corporate level (Agrawal & Sahasranamam, 2016; Woodson et al., 2019). It is necessary to advance in the knowledge of the factors that may enhance inclusive innovation and generate positive social and economic impacts.

In this work, we focus on the crucial role that upper echelons and managers play in promoting inclusive innovation since they are responsible for strategic decisions and resource allocation (Galema et al., 2012; Halme et al., 2012; Zaefarian et al., 2015). Specifically, we analyze: (a) gender diversity in management positions (at all levels of the organization, not only top management teams and on the board of directors as an antecedent of inclusive innovation); (b) the relationship between inclusive innovation and a firm's performance.

Our research question is relevant for different reasons. First, from the point of view of corporate governance, the incorporation of women in decision-making responds to strategic interests by meeting the demands of stakeholders, while at the same time it has proven to be a factor that can improve the social and financial performance of firms (e.g., Baker et al., 2020; Terjesen et al., 2009). Previous evidence shows that gender diversity particularly impacts actions and results related to social engagement such as corporate social responsibility, philanthropy, charity or social performance (e.g., Bear et al., 2010; Boulouta, 2013; Byron & Post, 2016; Galbreath & Tisch, 2022). Second, gender diversity contributes to disruptive change processes within organizations in a participatory way and provides new ideas and solutions to problems (Nielsen & Huse, 2010), which are necessary for inclusive innovation (Anderson & Markides, 2007). Indeed, previous results confirm that gender diversity influences social innovation (Cukier et al., 2011) and innovation results (Ruiz-Jiménez et al., 2016).

Multiple theoretical lenses support the impact of gender diversity on corporate governance (Terjesen et al., 2016). We rely mainly on two theories, the expectation states theory and the signaling theory. Expectation states theory provides a feminist lens on the expectations of competences and performance of women in management teams, determining their influence and legitimacy in decisions and actions related to inclusive innovation. Given cultural beliefs about gender, the presence of women is identified with higher expectations regarding their performance in social matters. In turn, the signaling theory explains how inclusive innovation is an external signal for stakeholders who identify it as a company's commitment to the activities aimed at bottom-of-the-pyramid, thus achieving better results.

Our work makes contributions in different areas. First, at the organizational level, the role of women and inclusive innovation is unexplored. For this reason, we focus on the role of boards and management teams, a factor pointed out in previous qualitative research, as a necessary element for the implementation of inclusive innovation. It shows through a longitudinal and quantitative study that diverse

gender boards and management teams are an explanatory factor for inclusive innovation. Second, in addition to the social value that inclusive innovation provides, we offer evidence of the economic value of such strategy by measuring its impact on business results. Finally, this study contributes to the literature of gender diversity. We shed light on the mechanisms that explain that the presence of women in management teams influences the adoption of inclusive innovation in companies. Expectation states theory complements the previous theoretical explanations and contributes to understand, from a feminist perspective, how gender diversity operates in a firm's social engagement. Despite the abundance of literature on the effects of gender diversity in top management teams and boards, few works include a feminist theoretical lens to complement the gender-related or management theories (Boulouta, 2013). The logic of feminist theories can more fully inform the structural conditioning factors that act and explain how gender impacts corporations (Gherardi, 2010).

This paper is divided into five sections. Following the introduction, the second section offers the theoretical framework and hypotheses. The third section discusses the methodology of the empirical study, and the results are shown in the fourth section. In the last section, contributions and limitations as well as directions for future research are presented.

2 | THEORY

2.1 | Inclusive innovation

To a large extent, innovation literature (studies included in the theoretical framework are summarized in the Appendix A) regarding less developed and developing countries has focused on export markets or producing goods (rarely services) for higher-income local consumers with little attention to lower-income groups (Foster & Heeks, 2013). Conversely, inclusive innovation is explicitly oriented to poor segments of the population, comprising all forms of innovation (products, processes, business models, etc.) that are helpful for reducing poverty. This type of innovation should have a beneficial effect on the livelihood of low-income population and be offered at an affordable price. Innovative goods or services oriented to inclusivity are required to have a low-cost and high-quality nature, and they can even be exportable from the target regions to wealthier countries (frugal innovation) (George et al., 2012).

Literature on inclusive innovation is still nascent. We have found many conceptual studies but few empirical ones (Woodson et al., 2019). This scant empirical research is based predominantly on qualitative methodologies that explore successful cases. These cases describe how product or business model innovations have contributed to improving the life of poor/disadvantaged population segments. Most of these contributions focus on external factors that influence the effectiveness of new inclusive business models and reflect the challenges of firms (even multinational companies) to innovate in less developed settings. The external constraints are usually associated with market failures, problems in institutional environments, and deficient infrastructures in bottom-of-the-pyramid contexts

(Díaz-García et al., 2013; Halme et al., 2012). Other examples of studies examine different settings concerning solar photovoltaic technologies in India, 3D printing in Brazil, the farming sector in India and Mozambique, and so forth (Swaans et al., 2014; Woodson et al., 2019).

However, much more research is required into the intra-organizational dimensions or individual factors that might impact inclusive innovation and the way managers interpret the specific characteristics of underdeveloped markets (Halme et al., 2012; Mortazavi et al., 2019). This study advances the literature offering insights regarding certain organizational capabilities and strategies that can be used to promote inclusive innovation (Pansera & Owen, 2018; Peerally et al., 2019).

At firm level, more research with quantitative methodologies is needed to explore different dimensions that might enable the development of innovations aimed at reducing poverty while achieving economic performance objectives. We contribute to this research stream by exploring gender diversity in management and on the board of directors as a potential driver of inclusive innovation and a firm's performance through a longitudinal and quantitative empirical study.

2.2 | Gender social orientation: Expectation states theory

Gender diversity on corporate boards and its impact on corporate governance outcomes and performance have been analyzed through different theoretical perspectives at the macro, meso and micro level (Nielsen & Huse, 2010; Terjesen et al., 2009, 2016), mainly through the resource dependence theory and the agency theory (e.g., Bear et al., 2010; Hillman & Dalziel, 2003). Both theories allow us to justify that the presence of a greater number of women in decision-making bodies contributes to a greater diversity and quality of resources, or to the control function, respectively (Bear et al., 2010). These theories together with the social role theory have been used to explain how gender diversity in management bodies affects a company's social engagement (e.g., Bear et al., 2010).

Without claiming to invalidate these theories, this work attempts to build upon previous research by providing an additional perspective through the expectation states theory to elucidate why the presence of women in management teams and on boards can impact decisions concerning inclusive innovation. Expectation states theory raises the emergence of status hierarchies in situations where actors have to reach a common goal (Correll & Ridgeway, 2006). The shared focus of group members on the group goal (i.e., collective orientation) increases the pressure to assess the quality of each member's contribution and to establish how to act to achieve the desired result. This theory provides a feminist vision that is appropriate in situations where the presence of women is still a minority since it explicitly addresses gender differences in management bodies and their impact on the decision-making and results.

Feminist theory argues that gender is a social phenomenon consisting of a system of social practices that organizes social relations of

inequality based on the differences between men and women (Ridgeway, 1997). Gender acts as a multilevel system influencing cultural beliefs and resource distribution at the macro level, models of behavior and practices in organizations at the level of interaction, and roles and identities at the individual level. Expectation states theory helps to explain how gender status and the beliefs of the different competences associated with women and men have an impact on the contexts where social relationships are developed, as is the case with companies (Ridgeway & Correll, 2004).

Cultural gender beliefs are part of the gender stereotypes that define the differences in competence expectations between women and men (Correll, 2001). From a horizontal dimension, women are considered more communal than men, who are more agentic and instrumental (Eagly, 2009). But there is also a vertical differentiation according to which, men are usually seen as more competent in practices of greater importance, and women are less competent but more pleasant and communal in tasks that are considered less valuable (Fiske et al., 2002). Sex categorization activates gender stereotypes that affect people's judgments and behavior based on the limited characteristics assigned to each group. Moreover, gender stereotypes condition human behavior, that is, in addition to describing, they have a prescriptive function, according to which people model their behavior in accordance with what is expected from such stereotypes (Eagly, 2009). From the point of view of expectation states theory, when gender beliefs are salient they shape behavior more powerfully by affecting people's sense of what others expect (Ridgeway, 1997).

According to the expectation states theory, people's performance expectations or the evaluation by others of their contribution to the achievement of common goals are based on two types of status characteristics: specific and diffuse (Correll & Ridgeway, 2006). The former refers to specific knowledge or skills for the development of the evaluated task, and the latter is related to belonging to a group with salient characteristics such as gender, ethnicity, and so forth. Gender is salient in those contexts in which activities that are central to the context are culturally associated with stereotyped traits and abilities of one gender or another.

2.3 | Gender diversity and inclusive innovation

Once the board of directors has defined the strategy regarding inclusive innovation, managers will have the responsibility for its implementation and the successful achievement of objectives, emphasizing the importance of new ideas for solving social problems.

According to the expectation states theory, the specific knowledge or skills for the development of the evaluated task (specific characteristic) and gender as a salient characteristic (diffuse) are used to establish the evaluation by others of their contribution to the achievement of goals. These relative performance expectations create and maintain a hierarchy of participation, evaluation, and influence the actors that constitute the group's status hierarchy. These two types of characteristics are applicable to the context of inclusive innovation activities in companies.

On the one hand, when implementing social innovation initiatives within a firm, people who specifically have the knowledge and skills directly related to the achievement of this objective will be taken more into account. For instance, those managers who have experience or contacts related to bottom-of-the-pyramid activities, social entrepreneurship or the third sector, will be considered more competent to carry out tasks in this area. Some works have shown a greater participation of women in such activities compared to other types of business activities (Lortie et al., 2017). Accordingly, women in management positions might stand out for having specific knowledge or experience with these segments of the population or for having created a network of contacts with institutions and social sector organizations, which are potential key partners for the implementation of inclusive innovation strategies (Agrawal & Sahasranamam, 2016). In many cases, women may form these disadvantaged groups (Uduji et al., 2019). If women are potential customers, female managers can more easily understand their specific needs and help make more widely-accepted products and set more suitable marketing or distribution strategies. Women managers may also find it easier to access intermediaries and non-governmental organization contacts or other institutions located in the target communities, if they have previous experience or know people involved in social initiatives or charitable actions (George et al., 2012).

On the other hand, in this context of inclusive innovation, gender is salient and is influenced by cultural beliefs about women associated with their characteristics or skills with respect to social behavior. The expectation states theory emphasizes that these beliefs are the basis of sex categorizations that lead to gender stereotypes and the reason why women would be better evaluated to deploy actions related to inclusive innovation. As previously stated, women are aligned with the stereotypically feminine domain, distinguished by communal traits and preferences towards altruism and equity (Hechavarría et al., 2012) while men are associated with agentic traits (Eagly, 1987). Therefore, it is more likely for women to be attributed better competences to achieve inclusive innovation objectives since due to stereotyped ideas they are perceived as more oriented to solving social problems for groups that face poverty, inequality or disadvantages (Boulouta, 2013). In consequence, the self-other competence expectations based on these gender beliefs would essentially determine that the opinions, ideas and proposals of women regarding inclusive innovation are more listened to, valued and considered. This will lead to more legitimacy within the organization (Correll & Ridgeway, 2006), allowing women to achieve greater collaboration in the implementation of these actions (Halme et al., 2012).

Finally, when these cultural beliefs are widely recognized and institutionalized, they can also impact and influence the behavior of the individual (Wood & Eagly, 2010), making it more likely, in line with these stereotypes, for women to adopt pro-social behaviors and perform more altruistic actions in companies as they are considered to have the capacities to do so or will be better evaluated in the completion of the task (Correll, 2001; Ridgeway, 1997). For example, Rao and Tilt (2016) found that companies with more female directors tend to be more generous towards communities and pay more attention to

their stakeholders' welfare, suggesting that the presence of board members with altruistic preferences leads to more pro-social corporate behavior. Moreover, by being perceived as more competent, women can find in inclusive innovation initiatives an area in which to improve their trust, status and recognition within the company (Correll, 2001).

Therefore, even considering that not all women in management positions have the specific competences mentioned to successfully contribute to inclusive innovation, a greater presence of women in management positions will have more impact and legitimacy on decision-making and actions related to inclusive innovation. Thus, we formulate the following hypothesis:

Hypothesis 1. Gender diversity in management positions has a positive impact on inclusive innovation.

The role of the board of directors is essential to achieve the organizational and cultural transformation which is necessary to implement inclusive innovation strategies (Galema et al., 2012). The board of directors' composition may influence the settlement and guidance of strategic decisions and their interpretative frames and personal values determine their decision making (Carpenter et al., 2004). Consequently, board diversity impacts the board's decisions, as suggested by previous studies (Terjesen et al., 2009).

Women provide the board with different perspectives and may influence the decision-making process given their different experiences of the workplace, marketplace, public services and community (Rao & Tilt, 2016). The presence of women on the board of directors may bring resources such as personal ties, knowledge or values that will positively affect the firm's social performance (Cabeza-García et al., 2018). In fact, female representation on boards was found to be positively associated with corporate social performance (Byron & Post, 2016; Gherardi, 2010; Pucheta-Martínez et al., 2020), the strength ratings for corporate social responsibility (Bear et al., 2010) or corporate social responsibility disclosure (Cabeza-García et al., 2018).

Diversity means the integration of different backgrounds, cognitive resources and life experiences which may help reach common goals, and consequently it also increases the probability of achieving innovative results (Ruiz-Jiménez et al., 2016). There is evidence that diverse teams may identify market opportunities, through a better understanding of the unmet needs and consumer behavior in the bottom-of-the-pyramid markets (Galia & Zenou, 2012). Women on boards may have a better understanding of such markets, and a firm's opportunities in meeting those needs (Galia & Zenou, 2012; Terjesen et al., 2016).

According to expectation states theory, social beliefs about gender can also lead to women's participation on the board of directors and expectations about their contribution to performance can be more closely associated with social issues based on feminine stereotypes. For example, Boulouta (2013) highlights that in many companies, women are preferred in public affairs committees or corporate social responsibility areas (Burgess & Tharenou, 2002), and both are considered "soft" issues to the extent that women belong to the more

socially sensitive gender. Since gender stereotypical beliefs lead to the suggestion that women are more sensitive to social issues, they become candidates for such boards (Burgess & Tharenou, 2002). Therefore, given that gender is a salient characteristic, their opinions on the board will have a higher status and acceptance on issues related to inclusive innovation activities.

In sum, whatever the mechanism observed (specific or diffuse characteristics), women directors may be able to influence decisions about inclusive innovation in two ways. First, women may participate in the adoption of strategic decisions that consider social issues, such as the improvement of the wellbeing of disenfranchised members of society. Moreover, if female directors are oriented to such segments of the population due to their own life experience, they could persuade companies to become more sensitive to those members. Second, since they are perceived as more aligned with social issues, women may receive greater legitimacy and support from the board to act as leaders and may contribute to promote a change of mentality within the team and to consolidate actions in this area. Therefore, we pose the following hypothesis:

Hypothesis 2. Gender diversity on the board of directors has a positive impact on inclusive innovation.

2.4 | Inclusive innovation and firm performance

Addressing unmet needs pertaining to certain segments of the population may create new markets for the company, leading to higher performance. Tackling problems and meeting the needs of excluded population, may have a positive impact on corporate reputation, not only in bottom-of-the-pyramid markets but also in higher-income markets. Consumers are increasingly becoming aware of socially responsible behavior in firms. Thus, their buying decisions are influenced, among other things, by a company's ethical reputation (Hyun et al., 2016). This is consistent with the social dimension of corporate reputation proposed by Martín-de Castro et al. (2020). The authors suggest that corporate reputation is delimited by two main dimensions: (a) business dimension with an economic orientation based on stakeholders' reasoning and argues; and (b) social dimension with a sociological orientation associated with stakeholder's appealing and emotions.

According to the signaling theory, firms use visible signals to enhance reputation among society (Miller & Triana, 2009). When companies adopt a proactive approach like the one implied by inclusive innovation, their social engagement becomes more visible to stakeholders. Therefore, strategies such as inclusive innovation may signal an understanding and commitment with disenfranchised members of society in which a firm develops its operations, influencing consumer perceptions and purchasing habits (Bear et al., 2010; Miller & Triana, 2009). Consequently, we believe that inclusive innovation may have a positive impact on firm performance since reputation is crucial in reaching and maintaining a competitive advantage (Walker, 2010).

In addition, considering the assumptions of expectation states theory, the presence of women in management teams and on the board of directors could signal that managerial behaviors associated with the feminine orientation towards social initiatives, such as inclusive innovation, are valued by the firm. These actions legitimize the adoption of social behavior, and when doing so, improve individual and organizational performance (Dezsó & Ross, 2012).

Therefore, we pose the following hypothesis:

Hypothesis 3. Inclusive innovation positively influences the firm's performance.

3 | METHODOLOGY

3.1 | Research setting and sample

The research setting was a panel dataset of European public manufacturing firms for the period 2008–2017. Innovative competence is highly sector-specific and is essential for operating in bottom-of-the-pyramid markets. Manufacturing has high innovation potential compared to other sectors. Despite its declining weight in the overall European economy, manufacturing remains a crucial sector for innovation and for the fostering of a sustainable society and economy. This sector is innovating, using new technologies (e.g., robotics, new materials, and big data management) to address future demands. European manufacturing companies are taking advantages of new opportunities in high value-added activities both production related and with service-like characteristics (Veugelaers, 2017). These are relevant features since inclusive innovation involves the development and diffusion of new technologies that incorporate the needs of low-income consumers (Foster & Heeks, 2013). In the European context, there is a broad consensus that innovation does not only serve economic growth but also social welfare. The increased awareness of non-economic objectives has been applied extensively in policy development in Europe, the United States, and many other countries (Schillo & Robinson, 2017). Yet, over the last few decades, European policy has become more proactive when it comes to supporting inclusive innovation. Clear examples are: the adoption of the responsible research and innovation framework by the European Commission (Strand et al., 2015) that is meant to stimulate more socially inclusive forms of innovation; and Europe 2020—A strategy for smart, sustainable and inclusive growth, officially stated in 2010, where the European Commission called upon different agents, including the private sector, to address strategic targets such as poverty reduction and social inclusion (Karlsson et al., 2019).

We used two sources of information, the Environmental, Social and Governance database and Reuters Fundamentals, which are included in the Refinitiv Eikon data platform (Refinitiv, 2019). The research sample was drawn from the Environmental, Social and Governance database, the world's largest environmental, social and governance rating database. Information regarding the implementation of inclusive innovation began to be more consistent in 2008, while 2017

was the last available year in the database. These facts justify the period considered in our study. The Environmental, Social and Governance database comprises objective, relevant, auditable, and systematic quantitative and qualitative company-level data of public companies worldwide for several years. This makes it an excellent data resource for carrying out longitudinal studies. Thomson Reuters Eikon also offers financial information obtained from many different sources (e.g., annual reports). We gathered information from Reuters Fundamentals regarding firms' performance and some control variables included in the main analysis and the robustness checks. The validity and reliability of these databases have been established in previous studies (Cheng et al., 2014; Luque-Vílchez et al., 2023).

The initial population of European public manufacturing firms identified was 458 unique firms with a total of 4561 observations. Then, we identified a panel of European public manufacturing firms with information related to the main variables in this study. We have also collected information to control for several firm's strategic dimensions and attributes. Our final sample includes an unbalanced panel of 283 unique European public manufacturing firms, and the total number of observations is 2181. The models that include gender diversity in management positions, owing to the availability of this dependent variable, are based on a sample of 198 unique firms with a total number of 1144 observations.

3.2 | Measures

3.2.1 | Dependent and independent variables

To test Hypotheses 1 and 2, the dependent variable "inclusive innovation" is measured by a dummy variable reported by the Environmental, Social and Governance database that assumes value 1 if a "company distributes any low-priced products or services specifically designed for lower income categories (e.g., bridging digital devices, telecommunications, low cost cars and micro-financing services)." This definition considers both goods and services. Hence, it is suitable in measuring inclusive innovation in manufacturing firms since there is a trend in this sector towards the use of the amount of data accumulated on their products to sell related services (Veugelers, 2017). The second dependent variable used to test Hypothesis 3 is "performance," which is measured by the company market capitalization in euros for the focal firm each year in our sample. The use of market-based indicators of financial performance is consistent with other studies exploring the relationship between innovation or social responsibility and firm performance (Hawn & Ioannou, 2016; Przychodzen et al., 2020). Actions developed by a firm influence its legitimacy and reduce information asymmetry between the firm and critical stakeholders affecting the market value (Hawn & Ioannou, 2016).

"Gender diversity in management positions" is our first independent variable, which is coded as the percentage of women managers. This measure does not only include top management teams but refers to all line positions with profit-and-loss responsibilities that must

make decisions. This measure is consistent with the argument that managers at all organizational levels play a key role in the generation and implementation of corporate social initiatives. The second independent variable is "gender diversity on the board of directors" that is operationalized by the percentage of women on the board.

3.2.2 | Control variables

Numerous factors may influence innovation competence. We include several control variables: "high-technology firm," "ESG score" and "firm size."

The dummy variable "high-technology firm" is used to control whether a company belongs to a high-technology sector, which is characterized by rapid and continuous changes in products, markets and competitive environments (Makri & Scandura, 2010). The high-technology sectors identified, derive from the definition given by the OECD (2011). We have used the correspondence between ISIC and NAICS codes to identify high-technology firms.

The "ESG score" is found in the Environmental, Social and Governance database and reflects an overall company score based on the information in the environmental, social and corporate governance pillars. Its scale is from 0 to 100 with 100 representing the highest commitment to corporate social responsibility. Companies highly committed to corporate social responsibility establish and maintain better relationships with stakeholders that allow them to benefit from more opportunities to technologically innovate in areas related to environmental or social issues (Martinez-Conesa et al., 2017).

We use the number of employees to control for "firm size," which is usually associated to innovation outcomes in manufacturing sectors (Choi & Lee, 2018).

Additionally, to test Hypothesis 3, we include the control variable "product sales at discount to emerging markets." This is a complementary strategy of inclusive innovation that can explain different rates of performance. This control variable is dichotomic, taking value 1 when the company sells some products or services at a discount compared to normal retail prices in emerging markets.

Finally, a dummy variable for each year was included to control for factors that are the same for all cross-sectional units but vary over time (e.g., economic magnitudes).

4 | RESULTS

4.1 | Descriptive statistics and regression results

Table 1 reports descriptive statistics (mean, standard deviations, and correlations) for the variables used in our study.

By observing inclusive innovation, companies exhibit an increasing implementation over time. In 2008, only 1 firm had adopted this strategy and in 2017 there were 37 out of 181 companies (20.44%) designing and distributing new products and services for low-income population segments.

TABLE 1 Summary of descriptive statistics.

Variable	1	2	3	4	5	6	7	8	9
Mean	0.093	1.08E+10	22.925	17.868	0.277	59.305	30,255.28	0.046	62.861
Std. dev.	0.290	2.38E+10	12.503	12.628	0.447	15.847	52,730.88	0.211	20.221
Inclusive innovation	1.00								
Performance	0.44***	1.00							
Gender diversity in management positions	0.26***	0.32***	1.00						
Gender diversity on the board of directors	0.15***	0.15**	0.12***	1.00					
High-technology firm	0.18***	0.05**	0.14***	0.01	1.00				
ESG score	0.36***	0.35***	0.11***	0.34***	0.01	1.00			
Firm size	0.35***	0.58***	0.02	0.09	-0.05	0.37	1.00		
Product sales at discount to emerging markets	0.61***	0.45***	0.27***	0.14***	0.25***	0.25***	0.24***	1.00	
Reputation	0.35***	0.38***	0.19***	0.28***	-0.00	0.86***	0.41***	0.27***	1.00

*** $p < .001$; ** $p < .01$; * $p < .05$.

As for women's representation in management positions, the average percentage of female managers is 22.92%. There is 1 firm that does not have women in their management teams, and 5 with a percentage of female managers above 50%. The representation of women on the board of directors is lower. Nineteen firms do not have any women on the board of directors in the last year of the period analyzed, and only one company has a percentage of female members above 50.

Our sample includes mainly large firms. The mean number of employees is 30,255. Only two firms have less than 250 employees. There are 83 high technology companies.

We have a panel data of firms. To test the hypotheses, we used the generalized estimating equation regression method that was developed for use in analyzing longitudinal, panel, and series correlation in a pooled sample (Liang & Zeger, 1986). In this study, we account for changes regarding inclusive innovation and performance in a firm across time. Observation samples are not independent from year to year, thus the characteristic independence assumption across observations of least squares regression is not met. The generalized estimating equation algorithm accounts for correlation between records within the same cluster (data collected about the same firm during successive periods of time) thus, providing improved standard error estimates. The generalized estimating equation approach is less computationally intensive than either fixed effects or random effects, so it often proves less subject to instability and convergence problems. Random effects estimators consider all the observations, but they do not adequately account for unobserved heterogeneity at the group or cluster level. Fixed effects estimators deal with unobserved heterogeneity at cluster level, but at the expense of dropping all observations from clusters with no events. Generalized estimating equation specification overcomes these limitations since it is both efficient and accounts for unobserved heterogeneity reducing endogeneity concerns (Krishnan & Kozhikode, 2015).

Table 2 provides regression results. Given the binary character of the dependent variable, we used generalized estimating equation probit regression analysis. We entered the control variables in the first step (Model 1). In the second step, the independent variables were added (Model 2) providing the variance that accounts for gender diversity.

We tested our data for multicollinearity. The variance inflation factor is a measure of the reciprocal of the complement of the intercorrelation among the predictor variables: variance inflation factor = $1/(1 - r^2)$ where r^2 is the multiple correlation between the predictor variable and the other predictors. Variance inflation factor values greater than 10 indicate possible problems (Cohen et al., 2003). Regarding Models 1 and 2 (Table 2), the highest variance inflation factor score was 8.85, which was within acceptable parameters, and the highest mean of variance inflation factor was 4.29. Consistent with Hypothesis 1, a higher representation of women in management positions positively influences inclusive innovation ($b = 0.043$, $p < .001$). Considering the results offered in Model 2, Hypothesis 2 can also be accepted. The coefficient of gender diversity on the board of directors is positive and significant ($b = 0.021$, $p < .01$).

In examining the effect of control variables, evidence suggests that there are growing concerns regarding inclusive innovation in

TABLE 2 Generalized estimating equation regression results on inclusive innovation.

	Inclusive innovation					
	Model 1		Model 2		Model 3	
Gender diversity in management positions			0.043***	(0.005)	0.044***	(0.005)
Gender diversity on the board of directors			0.021**	(0.007)		
Women on the board of directors (dummy)					0.830*	(0.398)
High-technology firms	0.983***	(0.101)	1.535***	(0.149)	1.525***	(0.147)
ESG score	0.067***	(0.005)	0.085***	(0.008)	0.089***	(0.008)
Firm size	4.66E-06***	(0.000)	5.63E-07***	(0.000)	5.28E-06***	(0.000)
Year dummies	Included		Included		Included	
Constant	-6.203***	(0.392)	-9.046***	(0.722)	-9.597***	(0.784)
Wald Chi-square	299.08***		221.95***		220.08***	
N (firm-year observations) (unique firms)	2181 (283)		1144 (198)		1147 (198)	

Note: Standard errors are in parentheses.

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed tests).

high-technology firms. Additionally, findings exhibit that a higher level of corporate social responsibility implementation positively influences inclusive innovation. This result is consistent with studies that demonstrate the positive influence of corporate social responsibility activities in the increase of innovation performance (Martinez-Conesa et al., 2017). Findings are also in line with empirical evidence that reveals that corporate social performance drives innovation with high social benefits (Wagner, 2010). Firm size has also a significant effect but the value of the impact is very low.

Table 3 offers the results of the generalized estimating equation linear regression estimation to test Hypothesis 3. Model 1 includes only control variables. We add the independent variable accounting for inclusive innovation in Model 2. The variance inflation factors computed along the regressions shown in Table 3 do not indicate issues of multicollinearity (variance inflation factor coefficients < 10), the highest variance inflation factor score was 3.94, and the highest mean of variance inflation factor was 1.65. Hypothesis 3 proposes that inclusive innovation has a positive impact on performance. This hypothesis is supported, since the coefficient for the independent variable is positive and significant ($b = 8.88E+09$, $p < .001$). Offering product sales at discount to emerging markets, as a complementary strategy of inclusive innovation, has a significant and positive influence on performance. ESG score positively influences market capitalization. This result confirms the growing stakeholder's concerns for responsible practices that are perceived as a key determinant of long-run firm prosperity (Hawn & Ioannou, 2016). The control variable firm size is also positive and significant.

4.2 | Robustness and complementary analyses

To test the robustness of our findings, we considered alternative specifications of the models.

We ran a regression using an alternative measure of the variable regarding gender diversity on the board of directors while maintaining the variable gender diversity in management positions (see Model 3 in Table 2). We created the variable “Women on the board of directors (dummy)” which is a binary indicator of the presence of at least one female board member in a given firm-year. This is a commonly used measure of the level of board gender diversity (Terjesen et al., 2016). We did not use this binary alternative measure for gender diversity in management positions since only 1 firm does not have at least one female manager; thus, this dummy variable would not have explanatory power. We checked for multicollinearity by calculating the variance inflation factor scores for all the variables in the models, which were within acceptable ranges (all less than five, most less than three). Model 3 indicates that the presence of at least one woman on the board of directors has a significant and positive impact on inclusive innovation ($b = 0.830$, $p < .05$), which is consistent with Hypothesis 2. Therefore, results confirm that women have a greater predisposition to develop inclusive innovation.

The relationship between inclusive innovation and performance may suffer from endogeneity. This can occur for several reasons, including omitted variables, selection bias, reverse causality, among others (Wolfolds & Siegel, 2019). We employed the Heckman two-step method (Heckman, 1979) to address it. We estimated the first-stage equation as an independent probit model to predict whether firms had pursued inclusive innovation, and when the vector of independent variables includes product sales at a discount in emerging markets, high-technology firms, ESG score and firm size. The inverse Mills ratio generated in the first-stage probit regression was included in the second-stage regression to adjust for potential endogeneity (see Model 3 in Table 3). In this model, the results of the variance inflation factors range between 1.27 and 7.07, which are lower than value 10, the recommended cut-off level to raise concern about potential multicollinearity. The estimated inverse Mills ratio is statistically significant, and its inclusion increases goodness-of-fit when compared to Model 2 (Table 3). However, the estimation of the corrected

TABLE 3 Generalized estimating equation regression results on performance (market capitalization) and robustness checks.

	Performance							
	Model 1		Model 2		Model 3		Model 4	
Inclusive innovation			8.88E+09***	(1.14E+09)	9.13E+09***	(1.05E+09)	8.60E+09***	(1.82E+09)
Product sales at discount to emerging markets	1.27E+10***	(9.45E+08)	1.24E+10***	(9.83E+08)	2.63E+10***	(1.32E+09)	2.63E+10***	(2.23E+09)
High-technology firms	3.76E+09	(2.70E+09)	2.84E+09	(2.64E+09)	8.88E+09**	(2.70E+09)		
ESG score	6.05E+07***	(1.66E+07)	5.61E+07***	(1.73E+07)	4.75E+08***	(3.29E+07)	4.76E+08***	(5.54E+07)
Firm size	2.59E+05***	(9.47E+03)	2.52E+05***	(9.79E+03)	2.78E+05***	(9.2E+03)	2.77E+05***	(1.67E+04)
Inverse Mills ratio (λ)					1.41E+10***	(9.70E+08)	1.45E+10***	(1.65E+09)
Year dummies	Included		Included		Included		Included	
Fixed effects								
Constant	-5.48E+08	(1.73E+09)	-5.22E+08	(1.72E+09)	-6.10E+10***	(4.48E+09)		
Wald Chi-square	1548.0***		1510.71***		1967.64***			
R ²							0.39	
F							53.19***	
N (firm-year observations) (unique firms)	2181 (283)		2181 (283)		2181 (283)		2181 (283)	

Note: Standard errors are in parentheses.

*** $p < .001$; ** $p < 0.01$; * $p < .05$ (two-tailed tests).

model also supports Hypothesis 3. The value of the effect of inclusive innovation on market capitalization does not vary drastically for the initial estimation. The control variables have a similar influence on performance, except for the variable high-technology firm that has a positive and significant impact in the corrected model.

We accomplished an additional analysis to address the potential problem of selection bias. Our study is based on a sample of European manufacturing firms with available information on three dimensions: the implementation or absence of an inclusive innovation strategy and gender diversity in management and on the board of directors. The act of monitoring inclusive innovation and gender diversity might be an indicator of an underlying culture of openness and greater socially responsible behavior. Thus, we performed three comparisons in terms of ESG score and size between the firms with available information (sample) and firms without available information (rest of the population) on those three dimensions. The results of the t-tests (available upon request) suggest that there are no significant differences between both groups of companies, reducing concerns about selection bias.

There are some previous works that provide evidence on the existence of a size effect in the socially responsible behavior of a company. This research found size-driven differences in the motivation of firms to engage in corporate social responsibility practices and disclosure (Giannarakis, 2014). In this context, total assets have been used to measure firm size. We run the models displayed in Tables 2 and 3 using total assets as an alternative measure of firm size (results available upon request). These models offer similar coefficients of the independent variables with similar levels of statistical significance, confirming all the hypotheses. However, such models have worse goodness-of-fit, so we have maintained the original analyses.

In additional analyses, we used different estimation methods. We checked the robustness of the results offered in Table 2 employing a random-effects panel probit model (available upon request). We used a random-effects model instead of a fixed-effects model since our sample is drawn from a large population. In this case, it is appropriate to model the individual specific constant terms as randomly distributed across cross-sectional units (Greene, 2002). Using fixed-effects models of this type would artificially restrict the sample of firms and could therefore seriously limit our analysis. This robustness analysis confirmed the positive influence on inclusive innovation of gender diversity in management positions (Hypothesis 1). Likewise, we estimated model 3 (Table 3) using both random (results available upon request) and fixed effects in ordinary least squares regression. Model 4 in Table 3 represents the regression including year fixed effects. The variance inflation factor scores of the variables were all below 10. These robustness checks support the main findings, confirming Hypothesis 3.

Considering the foundation of the Hypothesis 3, we performed a complementary analysis to explore how reputation can mediate the effect of inclusive innovation on market capitalization. To measure the mediating variable “reputation” we use the social pillar score contained in the Environmental, Social and Governance database (Refinitiv, 2019). This is defined as “a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.” This ESG score is calculated through a percentile rank scoring methodology (in the range 0–100), based on three factors: companies that are worse than the current one, companies that have the same

TABLE 4 Complementary analysis: the mediating role of reputation.

	Reputation (mediator regression)		Performance (outcome regression)	
Inclusive innovation	14.594***	(1.703)	9.05E+09***	(1.93E+09)
Reputation			1.22E+08***	(2.39E+07)
Product sales at discount to emerging markets	7.710**	(2.269)	3.21E+10***	(2.53E+09)
High-technology firms	-2.888**	(0.894)	2.56E+08	(9.97E+08)
Firm size	0.0001***	(7.2E-06)	2.07E+05***	(8.4E+03)
Year dummies	Included		Included	
Constant	59.941***	(0.780)	-3.15E+09	(1.67E+09)
R ²	0.2375		0.4599	
F	61.42***		153.81***	
N (firm-year observations) (unique firms)	2181 (283)		2181 (283)	
Average mediated effect [95% Conf. Interval]			1.78E+09 [1.05E+09, 2.69E+09]	
Average direct effect [95% Conf. Interval]			8.97E+09 [5.38E+09, 1.26E+09]	
Total effect [95% Conf. Interval]			1.08E+10 [7.12E+09, 1.44E+10]	
% Total effect mediated [95% Conf. Interval]			0.164 [0.123, 0.250]	
Sensitivity parameter ^a			0.1094	

Note: Standard errors are in parentheses.

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed tests).

^aSensitivity parameter estimate of rho (ρ) for the average mediated effect to be zero.

value and companies that have a value at all. We tested the moderated relationship computing the Average Causal Mediate Effect (ACME) (Stata command: medeff) and performed sensitivity analyses (Stata command: medsens) to check the robustness of our results (Hicks & Tingley, 2011). Taking into account that both dependent variables (reputation and market capitalization) are continuous, the mentioned Stata commands must be used with ordinary least squares regressions. In order to avoid multicollinearity and run this complementary analysis, we do not consider the control variable ESG score since reputation is a pillar included in such score. Moreover, we also used Heckman's two-step method to control for possible selection bias. In this case, the inverse Mills ratio was not significant in the model specification indicating the absence of a potential endogeneity problem. Thus, we decided to estimate the models without the correction. Findings of the mediation analysis are detailed in Table 4. We reviewed the variance inflation factor scores for the models; the values ranged from 1.31 to 4.19—much lower than the accepted cut-off value of 10—indicating that multicollinearity is not a concern.

The direction of the original estimate is maintained since the mediating analysis explains less than approximately 30% (sensitivity parameter $\rho < 0.30$). Nevertheless, the exploration carried out offers interesting insights. Results suggest that inclusive innovation has a significant and positive impact on a firm's reputation. Implementing such a social strategy positively influences stakeholders' valuation, which confirm the increasing concerns about sustainability and social responsibility in business activities. Moreover, the firm's reputation significantly increases market capitalization. This finding is consistent with previous studies that demonstrate that there is a financial payoff from maintaining a good corporate reputation (Black et al., 2000; Dowling, 2006).

5 | DISCUSSION AND CONCLUSION

We explore the influence of women in management positions and on the board of directors in the implementation of inclusive innovation. By studying a panel data of European manufacturing companies, our findings reveal that gender diversity in management positions and on the board of directors are more likely to influence inclusive innovation. Gender diversity may imply a broader range of backgrounds, values, or connections to markets that benefits the development of an inclusive innovation strategy. Moreover, since gender is a salient feature, the presence of at least one woman on the board of directors could be sufficient under the premises of the expectation states theory. In addition, in our study we do not have specific information on the role of these women on the board or their specific link to strategic decision-making on inclusive innovation, an aspect that could help explain these results. For instance, it would be interesting to know if board directors have specific competences or values associated with inclusive innovation. It would also be valuable to find out if their presence on the board is related to these specific competences. This could corroborate that their opinions, even in minority, define strategies or act as inspiring social values for workers and stakeholders.

Based on the signaling theory, our study also demonstrates that inclusive innovation is more likely to influence performance. This result is useful to overcome the traditional assumption regarding the tension between social and economic value creation objectives in enterprises (Tiba et al., 2019). Firms can provide solutions to societal challenges such as poverty and aspire to earn financial profits.

This research has implications for theory and practice. It offers relevant insights to understand how the consideration of gender is relevant to the strategies and actions in specific contexts such as a firm's

social engagement. Through the expectation states theory, we provide new arguments to the explanations offered by different gender diversity theories that were previously used to justify the greater predisposition of women towards social practices in different business areas (Bear et al., 2010; Hechavarría et al., 2012; Terjesen et al., 2016). From this approach, evidence is provided that not only certain personal characteristics determine the “natural” predisposition of women towards prosocial or communal behaviors (Eagly & Johannesen-Schmidt, 2001). In addition to gender differences observed in terms of agentic and communal attributes that could justify female behavior in activities of a social nature, there are cultural and institutional factors that can be decisive (Ahl & Marlow, 2012). Gender is a social phenomenon; therefore, it is more than an identity or role that can be taught or defined in a family environment. On the contrary, gender acts as an institutionalized system of social practices at different levels and contexts.

Results also contribute to a broader understanding of how gender diversity is effective in decision-making and in what type of strategic areas it is valuable. Our findings show that one woman on the board is enough to influence inclusive innovation. This result contradicts the assumptions of the critical mass theory (Kanter, 1977), according to which, when women are a minority in male-dominated environments, they are treated as tokens and have little chance to exert influence on the organization until they become a consistent or significant minority (Konrad et al., 2008).

The expectation states theory offers an alternative explanation to the critical mass theory of why women may or may not have influence in management teams even though they are a minority. Gender status means that in tasks more associated with feminine characteristics, women can have more influence and legitimacy on issues such as social orientation, although they do not reach a minimum critical presence. Our results suggest that additional studies are necessary to explore under what conditions and to what extent gender status is a determining factor in the influence of women minority in the board of directors based on cultural gender beliefs.

Moreover, this study represents an advance in previous literature that mainly followed a qualitative approach. It provides new evidence that supports the need to reinforce social practices as part of the strategic behavior of the company and overcome the more traditional and normative vision of corporate social responsibility.

Our study also has managerial implications. Exploring the implementation of inclusive innovation, it reveals that women may enhance firm performance. The mechanism through which gender diversity impacts social innovation requires a critical analysis by companies. Their actions can indirectly promote the discourse that women, to gain legitimacy, must continue to demonstrate that they provide value, not only economic, but also social. Companies must work on actions that can help change social beliefs about what is expected of men and women and establish that the results and decisions of social practices are a consequence of gender inclusion rather than simply the presence of women at management level. Furthermore, companies must establish policies that guarantee the participation and influence of women and men in decision-making in any area of the

company, avoiding assigning responsibilities aligned with gender cultural beliefs or stereotypes. Consequently, companies will be able to benefit from gender diversity and contribute to achieving effective equality.

This research also reflects the relevance of inclusive innovation practices. Our results urge businesses to pay more attention to the bottom-of-the-pyramid markets. Commercializing new products that benefit society is an initiative that also contributes to a firm's economic sustainability (Ansari et al., 2012). Furthermore, these practices favor a proactive approach in the social engagement of companies that can be decisive for a new generation of companies willing to create shared value.

This work has some limitations that can be overcome in future research. We focus on women in management positions and on the board of directors. Future research might also analyze the workforce level. Gender diversity at all those levels of the organization may create an inclusive culture that enhances creativity and innovation, and a greater commitment to social values. We do not consider other types of diversity such as: race, ethnicity, age, disability, and so forth. This may contribute to the development of diverse social networks, better negotiation abilities that benefit the relationships with stakeholders, and the attaining of heterogeneous skills and knowledge which can be useful to create and adapt goods and services to market needs. Future works should examine the consequences of a diverse management team and workforce, analyzing the interactions of minority and gender and other types of operational diversity. The expectation states theory may also serve as a theoretical framework, since gender along with race or ethnicity are salient individual characteristics. Our sample includes European manufacturing companies, and all of them are publicly traded firms. Manufacturing firms play a key role in the transition towards a more sustainable economy, offering more efficient and affordable products among other strategies. Nevertheless, our findings may not be generalizable to other sectors. Moreover, although in manufacturing industries, activities have increasingly service-like characteristics (Veugeliers, 2017), future research would benefit from expanding this investigation to the service industry and other sectors not considered in this study. Likewise, the inclusion of private companies and other countries, specifically companies operating (and with their market shares) in developing countries, would help to establish generalized conclusions. The use of a dummy variable to measure inclusive innovation provides information about whether firms distribute any low-priced products or services specifically designed for lower income categories or not. However, the actions involved in this strategy are complex and firms may implement it in different degrees. Future studies might deepen the understanding of how inclusive innovation strategy is adopted and developed, for instance, through direct questionnaires to firms. It is possible that other unmeasured variables may account for our results, such as the background regarding managers and board members (education, previous experience in social practices, organizational tenure), board of directors composition and the role of women, or features of the bottom-of-the-pyramid markets where companies operate (supply chains, institutional context, and infrastructure development) that influence the firms'

capacity to develop inclusive innovation. To address the limitations mentioned above, it would be interesting to gather information from other databases and primary sources of information. This would allow us to confirm the findings, obtain a better understanding of the research question, and explore the potential research lines previously indicated.

In addition, for a deeper understanding of the mechanisms that influence the participation of women in social decisions, it would be necessary to carry out research of qualitative or experimental nature to clarify the impact of individual and social factors at different levels. We are aware that the quantitative methodology adopted is a limitation. It does not allow us to analyze the social construction of gender since it is approximated by a binary indicator, the sex variable, which simplifies gender into two categories. Qualitative research would help us understand why and how gender diversity influences inclusive innovation as well as discern if this strategy represents a central or a peripheral part of the organization business model.

Our research contributes to a better understanding of the relationship between gender diversity and inclusive innovation, and it represents one of the first quantitative studies in the field of the bottom-of-the-pyramid. The findings have theoretical and managerial implications and provide the motivation to continue the study of the unexplored issues mentioned above, which constitute promising areas of inquiry.

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APPENDIX A: STUDIES INCLUDED IN THE THEORETICAL FRAMEWORK

Inclusive innovation and social entrepreneurship*Conceptual, theoretical and review studies*

Foster and Heeks (2013), George et al. (2012), Mortazavi et al. (2019), and Zaefarian et al. (2015)

Qualitative methodology, case studies

Agrawal and Sahasranamam (2016), Anderson and Markides (2007), Halme et al. (2012), Pansera and Owen (2018), Peerally et al. (2019), Swaans et al. (2014), and Woodson et al. (2019)

Gender, social behavior*Conceptual, theoretical studies*

Correll and Ridgeway (2006), Eagly (1987, 2009), Gherardi (2010), Ridgeway (1997), Ridgeway and Correll (2004), Wood and Eagly (2010)

Surveys and quantitative studies

Correll (2001) and Fiske et al. (2002)

Gender diversity and corporate governance outcomes and performance

Author	Sample and methods	Dependent variable	Independent variables	Control variables
Bear et al. (2010)	51 health care companies. Quantitative (OLS regressions)	Corporate reputation	Director resource diversity; number of women on the board; mediators: institutional strength, technical strength	Financial performance (change in firm stock price, ROA); CEO duality
Dezső and Ross (2012)	1500 US firms (panel 1992–2006). Quantitative (fixed effects regression)	Performance (Tobin's <i>q</i>)	Female representation	Innovation intensity, size, firm age, leverage, CapEx intensity, marketing intensity, age of capital stock, number of managers on the top management team
Miller and Triana (2009)	326 US firms. Quantitative (OLS regressions)	Performance (ROI, ROS)	Board diversity (Blau's index, proportion of women and racial minorities); innovation; firm reputation	Firm age, liquidity, size, product diversification, international diversification, industry
Nielsen and Huse (2010)	201 Norwegian firms. Quantitative (hierarchical multiple regression analysis)	Board process* (development activities, open debate, conflict); board strategic control; board operational control *D.V. and mediators	Ratio of women directors	Board size, outsider ratio, CEO duality, insider ownership, chair tenure
Terjesen et al. (2016)	3876 public firms in 47 countries. Quantitative (generalized method of moments)	Performance (Tobin's <i>q</i> and ROA)	Percentage of independent directors; percentage of female directors (I.V. and mediator)	Board level (size, number of meetings, CEO/chair duality); firm level (debt-to-assets ratio, dividends, sector, number of employees, etc.); country level (GDP per capita, working women %, etc.)
Rao and Tilt (2016) and Terjesen et al. (2009)	Review	-	-	-

Gender diversity and CSR

Author	Sample and methods	Dependent variable	Independent variables	Control variables
Boulouta (2013)	126 US publicly traded companies (panel 1999–2003). Quantitative (IV method, GMM estimator)	Corporate Social Performance (total, strengths and concerns)	Board gender diversity	ROE, risk, size, R&D, industry
Byron and Post (2016)	Meta-analysis	-	-	-
Cabeza-García et al. (2018)	128 large and medium-sized Spanish listed firms (panel 2009–2013). Quantitative (ordered random effect probit model)	CSR disclosure	Percentage of women on the board, critical mass, % of women in the group of outside directors, at least three females outside directors	Profitability (ROA), size, leverage level, sector, board size
Hechavarria et al. (2012)	10,362 entrepreneurs and owner managers from 52 countries. Quantitative (one-way multivariate analysis of variance MANOVA)	Economic, social, and environmental value goals; social- oriented, environmental- oriented activities	Gender	Age, household income, education and home country; industry
Hyun et al. (2016)	1102 US listed firms (panel 2000–2009). Quantitative (fixed-effects OLS regressions)	CSR performance	Number and proportion of female independent directors on board; moderator: orientation towards consumer sales	Size, market and financial performance (sales growth, ROE, Tobin's <i>q</i>), leverage, R&D intensity; board level variables (size, orientation, etc.); others
Lortie et al. (2017)	150 US entrepreneurs. Quantitative (SEM)	Social performance	Gender; mediator: social salience	Founder age, firm age and size, human capital (education, management, experience)
Pucheta-Martínez et al. (2020)	Spanish nonfinancial listed firms (panel 2005–2014). Quantitative (tobit regression)	CSR disclosure or reporting	Percentage of female institutional directors, pressure-sensitive and pressure-resistant female directors	Board independence, leverage, profitability (ROA), size, board size; insider ownership sector
Gender diversity and innovation				
Author	Sample and methods	Dependent variable	Independent variables	Control variables
Díaz-García et al. (2013)	4277 Spanish companies. Quantitative (logistic binary regressions)	Innovation performance (radical innovation and incremental innovation)	Gender diversity (Blau's index)	Size, group membership, R&D team size, technology intensity of the environment, external expenses in R&D
	176 French firms.			

Gender diversity and innovation

Author	Sample and methods	Dependent variable	Independent variables	Control variables
Galia and Zenou (2012)	Quantitative (probit regression models)	Product, process, organizational and marketing innovation	Percentage of female directors on board; age diversity on board	Size, R&D expenditure, training, cooperation, openness, sector, market; board size, independent members
Ruiz-Jiménez et al. (2016)	205 Spanish technology-based firms. Quantitative (hierarchical linear regression)	Innovation performance	Knowledge combination capability, gender diversity in the TMT (Blau's index)	Size, age, investment in R&D