Establishing the boundary conditions for female board directors' influence on firm performance through CSR

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Abstract:

Integrating social role theory and stakeholder theory with group diversity literature and using data from a sample of S&P 1500 firms from 2007 to 2015, this study examines the boundary conditions under which female board representation increases firm performance through their positive influence on corporate social responsibility (CSR). Specifically, the effects of female board representation on firm performance through CSR is most pronounced when female directors have a greater power to promote CSR and when the firm has the motivation (i.e., being innovation intensive) to engage in CSR. Moreover, this moderated mediation model holds especially for three dimensions of CSR (e.g., environment, community, and employee relations), shedding light on the nuances of what women bring to the table.

Keywords: boundary conditions | corporate social responsibility | female board representation | firm performance

Article:

1. Introduction

Starting from a small base, there has been an unprecedented surge of female representation on corporate boards in the past decade. Among the 4218 global companies covered in MSCI's study (Lee, Marshall, Rallis, & Moscardi, 2015), the percentage of women on corporate boards increased from 9.3% in 2009 to 15.3% in 2015. More recently, a report shows that among 2541 MSCI ACWI Index companies, female board representation has further increased from 15.8% in 2016 to 17.3% in 2017 (Eastman, 2017). Some policymakers appear to appreciate gender differences because female directors tend to bring different perspectives to boards due to their unique values, experiences, and knowledge (Post & Byron, 2015). For example, Senate Bill 826, which was signed into law by the governor of California, requires that each publicly held company headquartered in California has to have at least one female board member by the end of 2019. Research has generally shown that female board representation is associated with a firm's positive accounting returns (Conyon & He, 2017), though some studies have documented a

negative (Adams, 2016, Adams and Ferreira, 2009), nonlinear (Owen & Temesvary, 2018), or nonsignificant (Miller and Triana, 2009, Pletzer et al., 2015) relationship between the two. Thus, scholars have shown an increased interest in understanding what female directors bring to the table in terms of contributions to firm financial performance (Finkelstein and Mooney, 2003, Kirsch, 2018) and the boundary conditions under which female directors are especially relevant and desirable (Byron & Post, 2016).

The goal of this research is to establish a mechanism linking female board representation to firm performance. Importantly, this research explores the boundary conditions to explain under what circumstances greater female board representation enhances firm performance through this particular mechanism. Specifically, we propose that corporate social responsibility (CSR), defined as "actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (McWilliams & Siegel, 2001, p. 117), would be such a mechanism. Although empirical evidence has generally supported a positive effect of female board representation on CSR (Bear et al., 2010, Byron and Post, 2016, Cook and Glass, 2018, Galbreath, 2016) and a positive effect of CSR on firm financial performance (Orlitzky et al., 2003, Wang et al., 2016), few studies have theorized why improving CSR serves as the mechanism through which female directors contribute to firm financial performance.

Moreover, prior research has argued that whether female directors could effectively promote CSR is contingent upon two critical factors—the extent to which female directors are *able* to influence boards of directors and the extent to which firms are *motivated* to fully utilize what female directors may bring to the table (Byron and Post, 2016, Post and Byron, 2015). We thus posit that one critical contingency for female directors to exert a greater impact on CSR, and ultimately firm performance is female directors' power, indicated by multiple board memberships the female director holds. Regarding a firm's motivation to promote CSR, prior research has documented the important role that business strategy plays in influencing firm performance (Chen et al., 2018, Dwyer et al., 2003, McGuire et al., 1988). The rationale is that firms become more profitable by engaging in socially responsible initiatives when these initiatives are aligned with a firm's strategy. Therefore, we explore the firm's business strategy as a critical contingency factor. We focus specifically on innovation strategy, which is characterized by continually seeking to exploit new product and market opportunities, identifying emerging trends, and attempting to be on the cutting edge of change (Richard, McMillan, Chadwick, & Dwyer, 2003). Research has suggested that innovation strategy is the most important building block of competitive advantage for a firm (Hill & Jones, 1998). Because CSR serves as insurance-like protection for intangible resources (Luo & Bhattacharya, 2009) and enhances a firm's competitive advantages (McWilliams & Siegel, 2001), it should be especially necessary for firms that pursue an innovation strategy. We thus argue that innovation-intensive firms should be particularly incentivized to capitalize on female directors' commitment to and expertise in CSR-related initiatives.

This paper aims to make three contributions to the literature and organizational practice. First, integrating the social role theory of gender differences and stakeholder theory with group diversity literature, this research joins the conversation about *how* gender diversity in the boardroom affects firm performance by theorizing on the role of corporate social responsibility as a mediating mechanism. Second, this research takes a contingency approach (Dwyer et al.,

2003) and explores two contingencies, namely, female directors' power and firm's innovation intensity, under which the effects of female board representation on CSR vary. This thereby advances our understanding of *when* female directors' impact on CSR will be maximized (or mitigated). Third, we explore the conditional indirect effect of female board representation on firm financial performance to shed light on *when* and the *extent* to which female board representation contributes to firm financial performance through CSR. In summary, our study examines the mechanisms of and boundary conditions for the impacts of female board representation as it models *whether*, *how*, *when*, and the *extent* to which employing more female directors is beneficial for a firm's bottom line (i.e., financial performance), a topic of interest to policymakers and business practitioners. Fig. 1 summarizes our overall model.

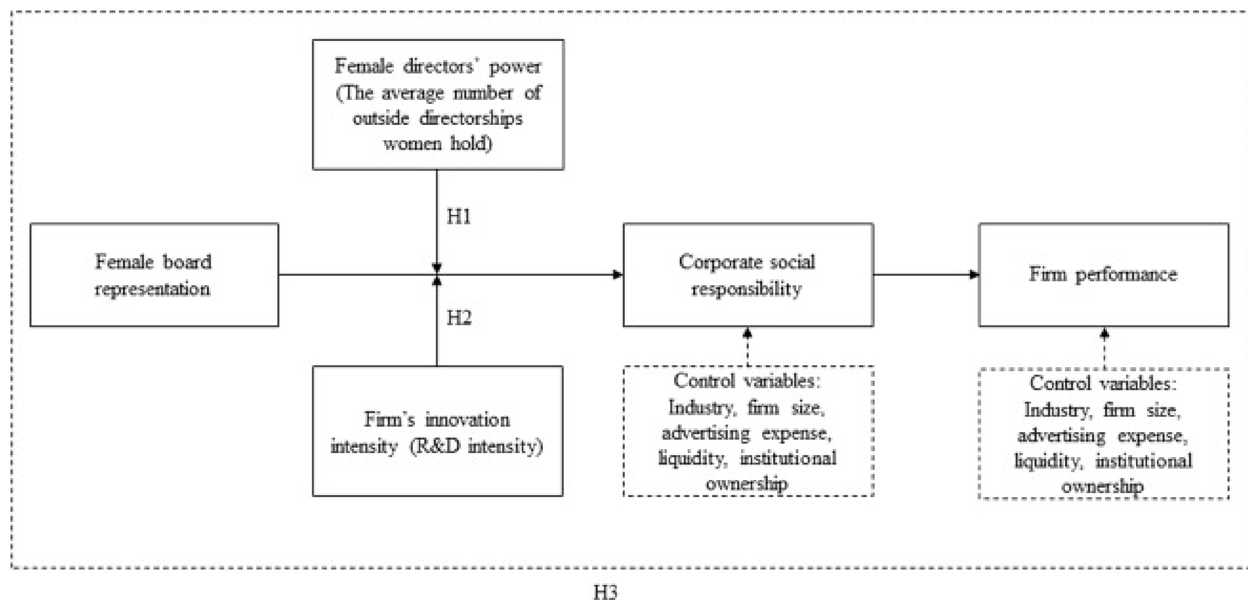

Fig. 1. Hypothesized model.

2. Theoretical background

2.1. Female board directors' influence on firm performance

There has been a rich body of research that theorizes on and empirically examines the relationship between female board representation and firm performance. Female board representation, sometimes denoted as board gender diversity, refers to the proportion, number, or presence of women on boards of directors (Post & Byron, 2015). Prior studies have used different theoretical perspectives to explain why female board representation influences firm financial performance. Female directors are value relevant (Pathan & Faff, 2013) for several reasons. First, board gender diversity can help alleviate the "groupthink" symptom, which tends to occur in homogeneous groups (such as all-male boards) and is detrimental for critically evaluating alternative perspectives (Janis, 1972). Second, female directors are typically considered to be hardworking and have superior communication skills (Robinson & Dechant, 1997). They also tend to hold advanced degrees compared to their male counterparts (Carter, D'Souza, Simkins, & Simpson, 2010). These qualities can improve the decision-making ability of the entire board, thus benefiting firm performance. Third, female directors' more diverse

interests and social networks are likely to translate into insights relevant to a firm's multiple stakeholders (Post & Byron, 2015), creating valuable resources that ultimately translate into firm performance.

These perspectives point to the conclusion that female board representation has a positive effect on firm performance. However, empirical results are mixed. Specifically, Adams and Ferreira, 2009, Adams, 2016 showed that female board representation had a negative effect on firm performance. There are other studies documenting a nonlinear (Owen & Temesvary, 2018) or insignificant effect (Miller and Triana, 2009, Pletzer et al., 2015, Rose, 2007). These mixed findings suggest that the relationship between female board representation and firm performance may not be direct and that explanations concerning the mechanisms through which female directors influence firm performance are needed (Galbreath, 2018).

2.2. The mediating mechanism of CSR[1]

Post and Byron (2015) argued that the contribution of female directors on firm performance is *indirect* and goes through the firm's strategic actions that they influence as directors. Galbreath (2018) proposed that one such action that gender-diverse boards tend to promote is CSR, which is often integrated as a critical component of corporate strategic actions in order to help organizations gain competitive advantages and create higher organizational value (McWilliams & Siegel, 2001). According to MSCI ESG Research (2015), CSR manifests in six broad domains: environment (e.g., switching to cleaner energy sources), community (e.g., supporting local businesses), employee relations (e.g., developing excellent employee training programs), human rights (e.g., undertaking exceptional human rights initiatives), product (e.g., ensuring product quality and safety), and governance (e.g., instituting strong governance structures).

An increasing number of studies have examined the relationship between female board representation and CSR. In a meta-analysis of 87 independent samples, Byron and Post (2016) reported a positive correlation between female board representation and CSR. However, theory development and empirical evidence concerning the mediating role of CSR are limited. In the following, we provide three explanations for why female directors are more adept at promoting CSR-related strategic direction, which serves as an important channel through which female directors contribute to firms' financial performance.

First, a social role theory of gender differences (Eagly, Wood, & Diekman, 2000) suggests that gender roles specify assumptions and expectations about the attributes women and men hold. Women are often expected to possess communal characteristics and behaviors (Elsesser & Lever, 2011), such as being relationship-oriented, kind, helpful, concerned, and sympathetic to others' needs (Rosette & Tost, 2010). Such expectations promote women's values that emphasize a voluntary concern for the welfare of others and concern for the welfare of those in broader society and nature (Adams and Funk, 2012, Schwartz and Rubel, 2005). Findings based on 77,528 individuals from 70 countries show that women consistently rate these values higher than men do (Adams and Funk, 2012, Schwartz and Rubel, 2005). The pattern has been confirmed in a survey of 628 boards of directors (Adams and Funk, 2012, Schwartz and Rubel,

[1] We thank an anonymous reviewer whose comments have greatly improved the development of this section.

2005), suggesting that, in general, female directors place more emphasis on concern for the welfare of other people and the environment. CSR is essentially about "furthering some social good." Driven by female directors' internal values and interests, female directors should thus enjoy CSR-related activities more and be more energized to promote CSR-related strategic actions than their male counterparts.

Second, a group diversity perspective argues that female directors often bring diverse information, resources, and perspectives to boards due to their diverse backgrounds and experiences (Byron & Post, 2016). Information diversity can alleviate "groupthink" symptoms and thus lead to more out-of-the-box solutions and evaluations of alternative perspectives. Research shows that female directors, particularly when compared to their male counterparts, are more likely to come from nonbusiness careers and to be more influential in the broader community (Hillman, Cannella, & Harris, 2002). Therefore, boards with a greater female representation are more likely to develop a peripheral vision and be attentive to noncore business problems, such as addressing environmental and social issues.

Finally, a stakeholder theory perspective posits that female directors are more likely to help the firm build an orientation towards various stakeholders' interests (Hillman et al., 2002). For example, because female directors are more inclined towards philanthropic causes and often have backgrounds in nonprofit fields, firms with a greater percentage of women on boards have been found to engage in greater charitable giving to community service organizations and programs (Williams, 2003). In a similar vein, because women are more concerned with environmental issues, firms with boards with three or more female directors have been found to exhibit better environmental CSR performance (Post, Rahman, & Rubow, 2011). There is also some evidence that female board members play an important role in influencing how products are tailored to the needs of women (Daily, Certo, & Dalton, 1999). Rather than serving a conventional monitoring role, which is enhancing shareholder values by controlling the agency conflicts between management and shareholders (Brennan, 2006), female directors are more likely to exercise their duties towards maximizing a broader range of stakeholder interests.

Given the above theoretical explanations, it is clear that female directors play an important role in incorporating CSR into a firm's strategic agenda. Indeed, engaging in these "soft improvements" (Rao & Tilt, 2016) is appealing to various stakeholders, who play a major role in determining revenues, resources, reputation, and, ultimately, the value of the firm (Aguinis & Glavas, 2012). Being socially responsible is not necessarily costly, especially when firms engage in CSR areas where female directors are experts or can provide resources. For example, female directors coming from nonprofit sectors may have the accumulated expertise and resources to facilitate community engagement activities more effectively and efficiently. Additionally, socially responsible firms often accumulate reputational resources (Bear et al., 2010) that are vital for determining firms' financial performance (Miller & Triana, 2009). For example, Bernardi, Bosco, and Vassill (2006) found that socially responsible companies have a greater likelihood of appearing on the "100 Best Companies to Work For" list. That said, CSR can be much more than a cost; rather, it can be a source of competitive advantage (Porter & Kramer, 2006). Thus, greater female board representation is likely to contribute to a firm's competitive advantage and, ultimately, to its financial performance, through the strong influence on promoting CSR-related strategic actions.

Next, we develop hypotheses concerning the boundary conditions for this mediating mechanism linking female board representation, CSR, and firm performance.

3. Hypotheses development

3.1. The moderating role of female directors' power in the relationship between female board representation and CSR

Social role theory suggests that people see women's gender roles as less congruent with leadership roles (Eagly & Wood, 2012). Perceivers typically associate communal qualities with women and agentic qualities with successful leaders. Therefore, prejudice against female leaders arises because of such role incongruities (Eagly & Karau, 2002). That is, women are seen as less effective than men in leadership positions. For example, researchers have argued that a female director's ability to exert influence in the boardroom and on corporate strategy may be limited due to stereotyping challenges (Kanter, 1993, Rao and Tilt, 2016). Given this context, *power* becomes essential for women to exert an impact (Ragins & Sundstrom, 1989). Power, defined as the capacity of individual actors to exert their will (Finkelstein, 1992), affects the endorsement of ideas in teams and organizations (Triana, Miller, & Trzebiatowski, 2013). Powerful board members tend to play a more influential role in the decision-making process (Pettigrew and McNulty, 1995, Westphal and Milton, 2000). Research has shown that when power is activated, people who have higher communal qualities and values (such as benevolence, kindness, and concern for the welfare of other people—values that women typically possess) tend to exhibit more socially responsible behaviors (Chen, Lee-Chai, & Bargh, 2001). Accordingly, powerful female directors should have a greater capacity to influence a board's strategic choice in the form of promoting CSR initiatives than those with less power. Indeed, research has found a stronger positive relationship between female board representation and CSR in countries where women are more likely to gain power (Byron & Post, 2016). Because directors who hold outside directorships are more accepted by their peers and have more powerful networks, serving on multiple boards signals the director's power (Finkelstein, 1992, Kaplan and Reishus, 1990). Therefore, we hypothesize that women who serve on multiple boards are perceived as more powerful and thus are more effective in promoting CSR.

Hypothesis 1. A female director's power moderates the positive relationship between female board representation and CSR, such that the relationship is stronger when a female director's power is higher.

3.2. The moderating role of firm innovation intensity in the relationship between female board representation and CSR

Byron and Post (2016) argue that the effect of female directors not only depends on their *ability* to influence boards of directors but also on firms' *motivation* to make full use of the diverse knowledge, experiences, and values that female directors bring. Building on Byron and Post's theorizing, we identify which firms are more motivated to embrace female directors' contributions to promote CSR.

We argue that firms pursuing innovation strategies are particularly motivated to promote CSR because CSR engagement enhances a firm's *competitive advantage* and *relational assets*. First, McWilliams and Siegel (2001) suggest that CSR is an integral element of firms' differentiation strategy, which is often seen in innovation-intensive firms. For firms that invest intensively in product or process innovation through R&D investment to generate a competitive advantage through differentiation (Porter, 1985), CSR can enhance such a competitive advantage by simultaneously satisfying consumer interests and creating new products or services (McWilliams, Siegel, & Wright, 2006). As examples, a product manufacturer using environmentally friendly production technologies not only attracts environmentally conscious consumers but also constitutes a product innovation, a service provider taking active actions to promote employee benefits also enjoys higher employee morale and creativity, and a firm devoting itself to community engagement is likely to receive the financial and nonfinancial support necessary for research and development investment. Therefore, engaging in CSR builds a competitive advantage for innovation-intensive firms. Second, innovation-intensive firms often rely considerably on relational resources such as the commitment and trust of talented and qualified core employees (Beatty & Schneier, 1997), which are intangible and difficult to control. Godfrey (2005) proposes that engagement in CSR creates invaluable "moral capital" that helps firms protect relational assets and maintain a healthy relationship with stakeholders. When engaging in CSR activities, firms accumulate moral reputational capital, which serves as insurance-like protection for its invaluable relational assets by mitigating negative stakeholder assessments and related sanctions (Godfrey, 2005).

A contingency approach to firm performance (Richard, 2000) argues that firm strategy is a critical contextual factor under which resources can turn into the best outcomes. Innovation strategy, in particular, has been extensively examined as such a contextual factor. Richard et al. (2003) found that the positive relationship between a firm's racial diversity and the firm's performance only appears in firms pursuing innovation strategies. Dezsö and Ross (2012) found that female representation in top management benefits a firm's performance only in those firms whose strategy is focused on innovation. Chen, Leung, and Evans (2018) found that female board representation is positively associated with performance only for firms in which innovation and creativity play a particularly important role. Consistent with this contingency approach, we argue that firms pursuing an innovation strategy are more likely to embrace female directors' contributions towards promoting CSR. Specifically, we hypothesize that firm innovation intensity moderates the effect of female board representation on CSR.

Hypothesis 2. Firm innovation intensity moderates the positive relationship between female board representation and CSR, such that the relationship is stronger in firms with higher innovation intensity.

3.3. The conditional indirect effect of female board representation on firm performance through CSR

Integrating the above, we hypothesize that the indirect effect of female board representation on firm performance through CSR is contingent upon female directors' power and the firm's innovation intensity. That is, female board representation should have the strongest positive relationship with firm financial performance through female directors' contributions to CSR in

highly innovation-intensive firms where female directors are regarded as powerful and influential.

Hypothesis 3. The positive indirect effect of female board representation on firm performance by improving CSR is strongest in firms with higher female directors' power and higher innovation intensity.

4. Methods

4.1. Sample

We begin our sample with all S&P 1500 companies included in the RiskMetrics database maintained by Institutional Shareholder Services (ISS), which provides detailed employment and demographic information on board members. We chose S&P 1500 companies because they are mature, leading companies with well-established boards of directors, they have the resources for conducting CSR activities (Miller & Triana, 2009), and they cover 90% of the market capitalization for U.S. stocks. To be included in the sample, companies must have their CSR performance rated by MSCI ESG Research Inc. (formerly Kinder, Lydenberg, Domini & Co., KLD, which was acquired in 2014) by 2013. They must also have financial data available from COMPUSTAT. The sample period begins in 2007 because board characteristics data from RiskMetrics are only available from 2007 onward. The sample period ends in 2015 because CSR performance ratings from KLD end in 2013, and two-year forward financial performance measures will be employed based on previous research (e.g., Miller & Triana, 2009). Additionally, because KLD issues annual CSR performance ratings at the end of each calendar year, we require sample companies to be calendar-year firms whose year-end dates are December 31. These criteria resulted in 3012 firm-year observations of 683 unique firms as our sample.

4.2. Measures

Female board representation. We employed three measures of female board representation. The primary measure was the fraction of female directors on the board, computed as the number of female directors divided by the size of the board (e.g., Adams and Ferreira, 2009, Campbell and Mínguez-Vera, 2008, Nielsen and Huse, 2010, Rose, 2007, Williams, 2003). We also used the number of female directors on the board (e.g., Bernardi et al., 2006, Farrell and Hersch, 2005) and the Blau's index of heterogeneity (Harjoto, Laksmana, & Lee, 2015). Due to extremely high correlations among these three measures (see Table 1), it is not surprising that the results based on all three measures are qualitatively similar. For parsimony, we reported our analyses and results using only one of the measures: the fraction of women on boards.

Power. Compared with their male counterparts, female directors are typically seen as less qualified and possess less ability to influence decisions (Ragins & Sundstrom, 1989). Although power comes from different sources, we focus on one base of power—prestige power (Finkelstein, 1992)—and measured power as the average number of outside directorships held by the female directors in each firm, as reported by the RiskMetrics database.

Table 1. Descriptive statistics.[a]

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 ROA	0.05	0.07														
2 ROS	0.07	0.11	0.79**													
3 ROE	0.12	0.27	0.55**	0.42**												
4 Tobin's Q	1.99	1.12	0.53**	0.24**	0.23**											
5 CSR	0.12	2.42	0.01	0.03	0.03	0.09**										
6 Fraction of women	0.12	0.10	0.04	0.06**	0.10**	−0.05*	0.17**									
7 Number of women	1.17	0.98	0.03	0.08**	0.11**	−0.07**	0.21**	0.94**								
8 Blau's index	0.19	0.14	0.04*	0.06**	0.10**	−0.05*	0.17**	0.99**	0.94**							
9 Outside directorship	0.97	0.80	−0.04	−0.01	−0.02	−0.05**	0.03	−0.01	0.05*	−0.01						
10 R&D intensity	24.26	44.10	0.04*	0.02	−0.02	0.26**	0.13**	−0.07**	−0.10**	−0.07**	0.01					
11 Company size	7.95	1.58	−0.07**	0.12**	0.05*	−0.23**	0.11**	0.28**	0.42**	0.30**	0.19**	−0.23**				
12 Advertising	10.95	29.30	0.16**	0.02	0.11**	0.27**	0.17**	0.04*	0.04*	0.04*	0.04*	−0.01	−0.15**			
13 Liquidity	2.27	1.59	0.04*	−0.01	−0.08**	0.14**	0.03	−0.17**	−0.23**	−0.19**	−0.10**	0.36**	−0.44**	−0.00		
14 Institutional ownership	0.82	0.17	−0.02	−0.07**	−0.04*	0.03	0.01	−0.08**	−0.13**	−0.07**	−0.01	0.07**	−0.23**	−0.02	0.13**	

N = 3012 (2926 for Tobin's Q). * $p < 0.05$, ** $p < 0.01$.

[a] Industry and year dummy variables are omitted from the table to save space and facilitate readability.

Firm innovation intensity. Innovation intensity was measured with the firm's research and development (R&D) expense scaled by total assets. R&D expense and total assets were obtained from COMPUSTAT. Following previous research (e.g., Miller and Triana, 2009, O'Brien, 2003), when R&D expense values were missing, these were set equal to zero since missing values indicate negligible R&D expenses.

Corporate social responsibility. Following prior research (e.g., Bear et al., 2010), CSR was operationalized with the MSCI ESG (formerly KLD) CSR rating, which covers multiple dimensions of CSR performance. MSCI ESG analysts evaluate both strength and weakness indicators in each subdimension and assign a value of 1 to an indictor when the corresponding strength or weakness applies to an organization. Therefore, the rating reflects a firm's efforts to address weaknesses and build strengths in the following areas of CSR: environment, community, employee relations, human rights, products, and governance. Consistent with prior research (e.g., Harjoto et al., 2015), the diversity dimension was excluded because female board representation was one of the evaluation items for the diversity dimension. For each company in the sample, we built a net CSR score for each dimension by subtracting the number of weaknesses from the number of strengths, thereby obtaining six net CSR scores. We then aggregated the six CSR scores into an overall CSR score and used the one-year forward CSR score in the model estimation to allow time for the effect of female board representation to occur. A positive overall CSR score indicates that the strengths outnumber the weaknesses, whereas a negative overall CSR score indicates the opposite.

Firm performance. Firm performance was operationalized as return on assets (ROA), defined as income before extraordinary items scaled by total assets and reflects a firm's ability to generate returns utilizing its resources. Following prior research (Miller & Triana, 2009), two-year forward firm performance (from the year CSR was measured) was measured to allow time for the effect of CSR to materialize in financial performance.

Control variables. A wide range of firm-specific factors influences a firm's CSR performance and financial performance. Therefore, it is necessary to include control variables to draw clean references regarding the role played by our focal variables. We controlled for the following variables in investigating the relationship between female board representation and CSR based on prior studies (e.g., Harjoto et al., 2015): firm size measured as the natural logarithm of total assets, advertising expenditure defined as advertising expenses scaled by total assets, liquidity computed as current assets divided by current liabilities, institutional ownership, and 2-digit SIC industry classification.

4.3. Analytical strategy

To test hypotheses involving moderation effects (Hypotheses 1 and 2), we performed a series of regression analyses. We include industry and year fixed effects to control for industry-wide and time-invariant factors that may affect firms' CSR performance and financial performance, respectively. We employed Hayes and Preacher (2013) conditional process analysis method to obtain various conditional indirect effects to test Hypothesis 3 (Hayes and Preacher, 2013, Hayes and Rockwood, 2020). This method is extensively used in behavioral science research and is particularly useful in estimating a moderated mediation model like ours (i.e., two 2-way

interaction effects in the first stage), as it examines the extent to which an effect (i.e., the effect of female board representation on firm performance) operates through a mechanism (i.e., CSR) depending on different conditions (i.e., the two boundary conditions) (Hayes & Rockwood, 2020).

5. Results

5.1. Main results

Table 1 presents the means, standard deviations, and zero-order correlations of all the variables.

Hypothesis 1 proposed that the positive relationship between female board representation and CSR is stronger when female directors' power is higher. In Table 2, Model 1 shows that female board representation had a positive effect on CSR ($b = 3.137$, $se = 0.446$, $p < .01$), whereas Model 2 shows that the interaction term of the fraction of women and the average number of outside directorships women held was significant ($b = 2.826$, $se = 0.853$, $p < .01$). We further used Aiken and West (1991) approach to plotting the interaction effect (see Fig. 2). To make the interpretation easier, we plotted the relationships under three conditions: the average number of outside directorships women held being 0, 1, and 2. A simple slope test shows that when none of the female directors held any outside directorship (indicative of low power), female board representation was not related to CSR ($t = 0.59$, $p > .05$). When, on average, female directors held one or two outside directorships, this relationship became positive ($t = 7.32$, $p < .01$; $t = 6.00$, $p < .01$). Thus, Hypothesis 1 received support.

Hypothesis 2 proposed that the positive relationship between female board representation and CSR is stronger when a firm's innovation intensity is higher. In Table 2, Model 3 shows that the interaction term of the fraction of women and the firm's R&D intensity was significant ($b = 0.056$, $se = 0.010$, $p < .01$). We further used Aiken and West's (1991) approach to plotting the interaction effect under two conditions: low R&D intensity and high R&D intensity (i.e., standing at the 90th percentile in the sample) (see Fig. 3). We chose percentile instead of the standard deviation of the mean as the condition to plot the graph because the distribution of R&D intensity was not normal, and 54.2% of the sample firms had zero R&D expenses. A simple slope test shows that the effect of female board representation on CSR was stronger when R&D intensity was high ($t = 2.44$, $p < .05$) rather than low ($t = 3.59$, $p < .01$). Thus, Hypothesis 2 received support.

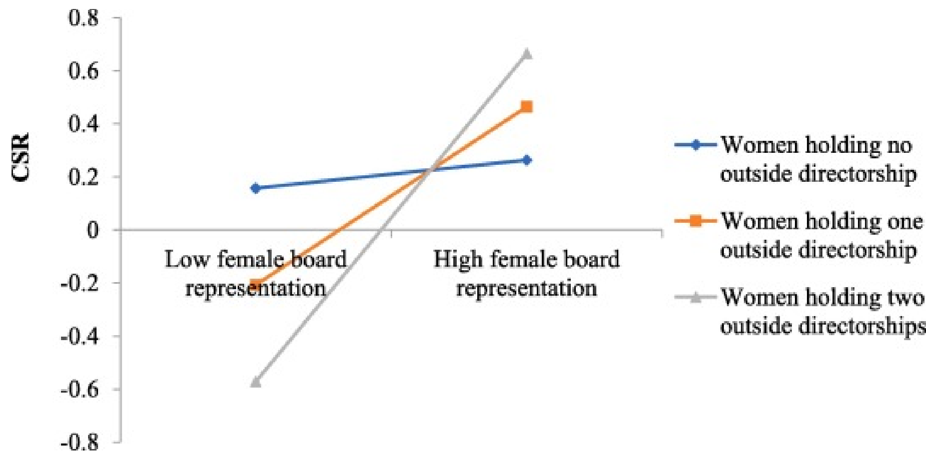

Fig. 2. Plot of the moderating role of the average number of outside directorships women hold linking female board representation and CSR. Female board representation is measured as the fraction of women on boards of directors.

Table 2. Regression analyses.[a]

Dependent Variable	**(1) CSR**	**(2) CSR**	**(3) CSR**	**(4) ROA**	**(5) ROS**	**(6) ROE**	**(7) Tobin's Q**
CSR				0.002**	0.003**	0.003	0.034**
				(0.001)	(0.001)	(0.002)	(0.009)
Company size	0.263**	0.248**	0.261**	0.001	0.012**	0.011**	−0.083**
	(0.031)	(0.032)	(0.031)	(0.001)	(0.002)	(0.004)	(0.015)
Advertising	0.007**	0.006**	0.006**	0.000**	0.000	0.001**	0.008**
	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)	(0.001)
Liquidity	0.063**	0.063**	0.039	0.001	0.003**	−0.012**	0.056**
	(0.029)	(0.029)	(0.029)	(0.001)	(0.002)	(0.004)	(0.014)
Institutional ownership	−0.429	−0.486	−0.514**	−0.019**	−0.016	−0.102**	0.066
	(0.252)	(0.253)	(0.250)	(0.008)	(0.013)	(0.033)	(0.122)
Fraction of women (WO)	3.137**	0.530	1.797**	0.016	−0.010	0.146**	−0.329
	(0.446)	(0.903)	(0.501)	(0.014)	(0.024)	(0.058)	(0.216)
Outside directorship (OD)		−0.421**					
		(0.135)					
R&D intensity (RD)			0.001				
			(0.001)				
WO × OD		2.826**					
		(0.853)					
WO × RD			0.056**				
			(0.010)				
Constant	−6.051**	−5.422**	−6.060**	0.089**	−0.004	0.201	2.873**
	(0.996)	(1.012)	(0.991)	(0.032)	(0.053)	(0.129)	(0.474)
Observations	3012	3012	3012	3012	3012	3012	2926
R-squared	0.321	0.324	0.335	0.171	0.139	0.114	0.302

* $p < 0.05$, ** $p < 0.01$.

[a] Industry and year dummy variables are omitted from the table to save space and facilitate readability. Unstandardized regression coefficients are reported with standard errors in the parentheses.

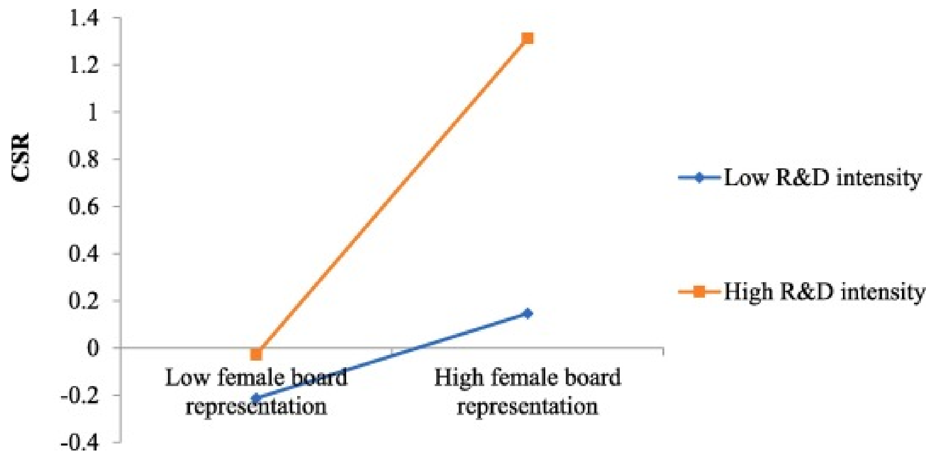

Fig. 3. Plot of the moderating role of firm R&D intensity linking female board representation and CSR. Female board representation is measured as the fraction of women on boards of directors. Establishing the Boundary Conditions for Female Board Directors' Influence on Firm Performance through CSR.

Finally, as shown in Table 3, using a conditional process analysis following Hayes and Rockwood (2020) model construction guidelines, estimation of the indirect effect of female board representation on firm performance through CSR was strongest when female directors were of high power (i.e., holding an average of two outside directorships) and when the firm's innovation intensity was high (i.e., standing at the 90th percentile in the sample) (point estimate = 0.012; 95% CI = 0.003, 0.023), supporting Hypothesis 3. However, in the condition of low power and low innovation intensity, the indirect effect of female board representation on firm performance through CSR was not significant (point estimate = 0.0001; 95% CI = −0.003, 0.003). In the other two conditions (i.e., low power and high innovation intensity; high power and low innovation intensity), the indirect effect of female board representation on firm performance through CSR was significant, but the magnitude was substantially smaller than that in the high-high condition. We further explored whether there was an indirect effect when female directors held an average of one outside directorship in innovation-intensive firms. The point estimate was 0.010 (95% = 0.003, 0.018), suggesting that the mere appearance of power helped.

Table 3. Results for conditional indirect effects of female board representation on firm performance.

Mediator	**Condition**	**Level of moderator**		**DV: ROA**
		# of outside directorship female directors hold	**R&D intensity**	**Conditional indirect effect**
CSR	1	Low (0)	Low (0)	0.0001 (−0.003, 0.003)
	2	Medium (1)	High (90th percentile)	0.010 (0.003, 0.018)
	3	High (2)	Low (0)	0.005 (0.001, 0.011)
	4	Low (0)	High (90th percentile)	0.007 (0.002, 0.014)
	5	Medium (1)	Low (0)	0.003 (0.001, 0.006)
	6	High (2)	High (90th percentile)	0.012 (0.003, 0.023)

Unstandardized coefficients are shown, with 95% confidence intervals in the parentheses. The independent variable is female board representation.

To determine the real impact of female board representation on firm performance, we use the estimated effect size to calculate a firm's change in earnings based on a 10% change in female board representation (that is equivalent to adding one female director to a 10-person board). The results indicate that for a median-sized firm in terms of assets ($2426 million), when the female directors are of high power and when a firm's innovation intensity is high, a 10% increase in female board representation would lead to a $9.12 million increase in earnings.

5.2. Post hoc analyses

In this section, we performed three post hoc analyses to assess the robustness of our findings. First, we explored whether the results hold for other firm performance measures. ROS (return on sales), ROE (return on equity), and Tobin's Q were used as alternative performance measures. ROS represented a firm's revenue-generating ability (Miller & Triana, 2009) and was computed as income before extraordinary items scaled by sales revenue. ROE was measured as income before extraordinary items scaled by common shareholder equity. Tobin's Q was computed as the market value of equity scaled by the book value of assets. Table 2 (Models 5–7) shows that the hypothesized relationships were also significant for ROS and Tobin's Q, while the mediating role of CSR became marginally insignificant ($p = .187$) for ROE. Second, we explored the possibility that the effect of CSR might be reflected in a firm's financial performance sooner. To perform the analysis, we used one-year forward financial performance measures (i.e., ROA, ROS, ROE, and Tobin's Q) as the dependent variables. All the results remained, suggesting that it may take only one year for the benefit of CSR to materialize in financial performance.

Finally, in the main analyses, we constructed an overall CSR score by aggregating the CSR scores in each of the six subdimensions evaluated by MSCI (i.e., environment, community, product, employee relations, human rights, and governance). We were also intrigued by the fundamental question of whether and what specific areas of CSR did female directors emphasize that ultimately contributed to higher firm performance. Researchers have started to call for a nuanced examination of the role of different CSR domains on CSR outcomes (e.g., Baskentli, Sen, Du, & Bhattacharya, 2019). Although prior research found that female board representation is associated with some subdomains of CSR, including stronger governance, broader community engagement, more environmentally friendly strategies, and superior product quality (Cook and Glass, 2018, Glass et al., 2016), whether all these areas are functional in impacting firm financial performance remains unclear. As a result, we separately examined the mediating role of each CSR subdimension. The results showed that female directors indirectly contribute to significantly better firm performance by improving CSR primarily in the environmental, community, and employee relations domains.

6. Discussion

In the current study, we find that the effect of female board representation on firm performance is indirect via the mediating role of CSR, particularly the environmental, community engagement, and employee relations areas of CSR. This indirect effect is the strongest when these women are of high power and when the firm is innovation-intensive. Thus, our findings establish mechanisms through and boundary conditions under which a female director's positive effect on firm performance ensues.

This research contributes to the literature on gender diversity, women's leadership, corporate governance, and corporate social responsibility in several ways. First, we answered the call for theorizing about and testing *how* the presence of women in the male-dominated boardroom may enhance firm performance (Byron & Post, 2016). Extending the group diversity theory that suggests that board diversity contributes to firm performance due to reduced groupthink, we integrate social role theory and stakeholder theory in order to theorize that having more women in the boardroom significantly increases the board's strategic involvement in CSR, which then contributes to firm performance. Our post hoc analysis of the mediating role of each CSR subdimension suggests that female directors are particularly useful in promoting community, employee relations, and environmentally focused CSR, further revealing the "black box" of board processes (Finkelstein & Mooney, 2003). Thus, we shed light on how board gender diversity affects performance through shaping gender-relevant values, engaging in noncore business conduct, and satisfying various stakeholder interests as reflected in CSR engagement.

Second, this research takes a contingency approach and examines *when* female directors' impacts on firm performance will be maximized. Based on social role theory, female directors face stereotyping challenges as their gender role and leadership role are seen as incongruent, which could attenuate female directors' effectiveness. Our results have supported this prediction by suggesting that fulfilling a gender quota by merely adding women to the board may not necessarily boost firm performance. Two conditions are critical. First, these female directors should possess power. Second, firms need to have the motivation (e.g., driven by corporate strategy such as innovation) to embrace CSR. It should be noted that we are not suggesting that, given these strict conditions, a female director's role on its own is small or negligible. Rather, we inform theory building around understanding various boundary conditions under which an examination of women's leadership effects are more meaningful.

6.1. Practical implications

Our results suggest that it is especially critical for innovation-intensive firms to recruit more female directors to the boardroom. However, policymakers and organizations should also be cognizant of the importance of the quality of prospective female board members. We should not expect female directors to be superheroes. Our findings suggest that it is especially desirable to hire female directors who are more prestigious (manifested by holding multiple directorships).

6.2. Limitations and future research

The limitations of our work should be acknowledged. First, this study relies on archival data, which limits our ability to explore nuanced board processes through which female board representation influences CSR. Second, it is argued that directors with multiple directorships are too busy to monitor and advise executives effectively. Accordingly, they tend to focus their limited effort on firms that maximize their personal benefits (Ferris et al., 2003, Fich and Shivdasani, 2006). As our sample firms are S&P 1500 firms, powerful female directors are likely to allocate a substantial amount of their time and effort to leading these firms, which may not hold for smaller firms. Finally, our research is based on U.S. listed firms. As prior research has suggested that country-specific institutional environments can moderate the relationship between

female board representation and CSR/firm performance (Byron and Post, 2016, Post and Byron, 2015), future studies may extend our research model to a global setting where the moderating effects of the country-level institutional environment such as shareholder protection and gender parity could be explored.

6.3. Conclusion

In conclusion, this study simultaneously examined *when* and *how* female board representation impacts firm performance. We document that female directors are particularly helpful in enhancing firm financial performance through promoting environmental, community-oriented, and employee relations-focused corporate social responsibility as a strategic choice. Our results suggest that, not merely the quantity, but the quality of female directors matters. Firms benefit more when female directors are more well-regarded and influential. The firm's strategic focus on innovation is another critical condition under which female directors' positive effect will be realized. Overall, this research provides a nuanced understanding of the "business case" argument that firms with more women represented in the boardroom perform better.

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