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Board Gender Diversity and Corporate Social Performance in Different Industry Groups: Evidence from China

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Abstract: This paper examines the heterogeneous links between board gender diversity and corporate social performance in different industries across China. OLS regression models are approximated using the data of Chinese industries from 2009 to 2015. Robustness test and two-stage least square (2SLS) methods are incorporated to cater for robustness and endogeneity. Board gender diversity (BGD) stimulates corporate social performance (CSP) of firms with environmental and social risk exposure regardless of critical mass and directors' independence. It does so for firms with governance risk exposure while incorporating the critical mass effect and the director's independence. Overall, the positive effect of BGD is prevalent in different industries at an aggregate level while considering firms with an overall ESG risk exposure. The findings imply that BGD can mitigate the ESG risk exposure in terms of enhancing the CSP and the advantage can be transpired with the inclusion of even one female director (independent or executive) to the board. The study also highlights that BGD enhances CSP in industries with more environmental and social risk exposure while doing so in industries with governance risk exposure after complementation by critical mass and independent director effects.

Keywords: corporate social performance; ESG risk exposure; board gender diversity; critical mass theory; director independence; propensity score matching

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1. Introduction

Corporate social responsibility (CSR) has been considered a voluntary contribution of corporate entities for the benefit of the environment and society [1,2], while activities related to CSR were deemed as an obligation towards stakeholders and society. However, today, it has evolved into a benchmark in the firm-level performance appraisal system [1,3] and a three-dimensional model of Environmental, Social and Governance (ESG) implication has been evolved by different agencies in various ways [4,5].

This progression has diversified the role and responsibilities of boards to reflect on and decide for the long-term value creation of firms. In this regard, corporate governance literature has expansively celebrated the mantle and composition of the board of directors in a firm's processes and outcomes [6].

Board diversity fosters the inculcation of diverse perspectives in the boardroom based on the combination of versatile human and social capital, having a potential impact in subsequent performances of a firm [7,8]. The previous studies in this regard have mixed results, whereby some studies suggest a strong positive relationship between BGD and performance [9] while others suggest a negative one [6,10]. Some of them even depict no relation whatsoever. The complex nature of CSR and omitting the contextual and institutional factors in the analysis discourse leads to this inconclusiveness [11].

This background raises the question regarding the mode of relationship between BGD and corporate social performance (CSP) [10,12] as to how these two variables are connected and what are the contextual factors which lead to these differing results. Some studies have attempted to shed light on the effects of demographic diversity on the CSR-related behaviour of firms; however, they have overlooked the influence on CSP at par [13,14]. Some studies have investigated the relationship between BGD and environmental performance; however, they did not identify the channels and modes of influence on the other two dimensions of CSR i.e., social and governance. Along with this, the extant literature does not consider the contextual factors concomitant with different industries and the majority of the studies have attempted to generalize a specific industry's results on other industries. This leads to the robustness problem, as different industries have different institutional characteristics and contextual influences [15].

Through this study, we venture to check the contextual role of different industries in the relationship between BGD and CSP. Reflecting on the instrumental stakeholder theory, resource dependence theory and upper echelon theory, we suggest regarding the differentiated relationship of BGD and CSP under the contextual moderating role of different industries. The instrumental stakeholder theory conjectures the instrumentality of "stakeholder's regard" in the financial outcomes of a firm and argues that discontent in any of the stakeholder groups will harm it. This theory connects CSR with corporate value and economic value creation [16,17].

The upper echelon theory (UCT) promulgates the dependence of effective decision making on the efficient information sharing and collaboration of Top Management Team (TMT) or board members whereby decisions regarding CSR is no exception [18]. In turn, resource dependence theory implies and previous research posits that BGD abet the provision of critical resources via extending access to the enriched and diversified human and social capital [19,20].

Although there is an emergent torrent of research on BGD and CSP, it is worth noticing that the contextual interplay of industry traits in the relationship between BGD and CSP is under-explored [21,22]. To attend to this gap, we insinuate our study while narrowing down the analysis of CSR performance to the industry level. We classify the industries into ten (10) categories based on the global industry classification initiative (GIDC) and inculcate their specific weightage in terms of financial risks attached to their ESG characteristics [23]. Our study includes 9397 firm-year observations and covers data from 2009 to 2015. A-share firms from all industrial sectors listed on Shenzhen and Shanghai stock exchanges with measurement of their ESG based financial risks are included in this study.

The rest of the paper is composed of Theoretical Framework, Hypotheses development, Methods, Results, Discussion and Conclusion.

2. Theoretical Framework

There are many frameworks to examine the interplay of corporate social performance and corporate governance; nevertheless, stakeholder theory is widely used in contemporary social responsibility discourse. Although it has different perspectives ranging from normative to descriptive to pragmatic, here, we utilize the instrumental version of the theory to match it with the overall model of the study, which induces the value creation of corporate social performance in response to economic risks associated with ESG dimensions. The concept of "Responsible Investment" promulgated by the United Nations also premises ESG factors in a connected web of "social awareness".

The stakeholder's attitude towards ESG performance and their expectations are reported to be dependent upon industry-specific characteristics. Additionally, the firm-level ESG strategies (reactive and proactive) are found subject to industry peer pressure [24,25]. Hence, the industry-relevant perspective is also taken into account while using this framework.

"Resource dependence theory" (RDT) establishes the need for a firm operating in an open system to barter and obtain certain resources for its survival" [21]. This theory pro-

mulgates that the administrative performance of a firm is dependent upon the soundness of human and social capital of individual members of the corporate board [19,26] and, therefore, BGD can perk up a firm's potential to fetch a variety of resources (knowledge, information contacts and reputation) to carry out the responsibilities of directors in terms of representing the interests of stakeholders [12,19,27].

Therefore, it follows that the combination of the resource-based view and upper echelon theory with instrumental stakeholder theory shapes the framework for the evaluation of the differentiated relationship of BGD with CSP under the industry perspective.

To avoid tokenism and its associated biases, the critical mass theory is inculcated in the study [28,29], which includes the consideration of critical mass of females in the board, rather than mere token representation.

3. Hypotheses Development

3.1. Corporate Social Performance and Board Gender Diversity

The diversity of board based on gender has been reported as an antecedent for the effectiveness of corporate boards in terms of participation [30], efficiency [31], decision-making process [32,33], competitive advantage [34], monitoring and evaluation [30,35], risk management [36], regulatory compliance [37], ethical concerns, corporate reputation, environmental performance [38], discretionary social performance [39,40], governance performance [41] and financial performance [6].

The role of the female in the provision of unique resources in terms of advice and counselling, legitimacy and channels of information for board efficiency is well established in previous studies [21].

The results of the empirical studies in this regard are mixed. Some research studies suggest a positive and strong relationship of BGD with the financial performance of the firm [42–44], firm's value [45], firm's outcomes [46] and firm's market performance [34,47,48]. Other studies suggest a negative relationship of BGD with firm's boardroom cohesion [49], tokenism led triviality [49], gross profit to sale ratio [50,51] and even firm's financial performance in some cases [6]. Some studies suggest no relation whatsoever [6,52–54]. The aggregate level CSP, however, suggests an overall positive relationship with outcomes of firms [55–64]. We hypothesize on the bases of positive findings of the broader concept of CSR and gender diversity as follows:

Hypothesis H1 (H1). *Corporate Social Performance of a firm is positively related to its Board Gender Diversity.*

3.2. Industry Effect

As is highlighted, the relation of aggregate CSR performance with BGD is, by far, positive; however, considering the aggregate level CSR performance or a single dimension of CSR, the multi-dimensional nature and breadth of the construct gets ignored. Different variables are worked out for moderation and mediation, which suggests the path of influence of BGD on CSP. For example, Boulouta [64] have worked out renewable energy as a mediator in this regard in the oil and gas industries. The pattern of the previous studies depicts the generalization of results obtained on the bases of datasets from firms of specific industries, which poses the issue of robustness as different industries have different characteristics and institutional context [65,66].

The institutional factors are continuously being reported since as early as North [67] who proposed the study of the relationship between BGD and corporate governance variables under the stresses and peculiarities of the institutional environment. Bansal and Roth [24] found a strong positive relationship between the variations in stakeholders' attitude concerning environmental performance and industry-specific characteristics. Moreover, Byron and Post [44] recommended the inspection of industry-specific conduciveness for the performance of women on boards. They found a progressive beneficial role of board gender diversity concerning environmental policy in terms of polluting potential of

different industries because the polluting industries are historically being reported to be male-dominated at par [68]. Their findings imply that the usefulness of industry context can be replicated in studying the relationship between BGD and CSP. In light of the above discussion, we propose the following hypotheses.

Hypothesis 2a (H2a). *The relationship between Corporate Social Performance and board gender diversity will be stronger in industries with more ESG risks as compared to the industries with fewer ESG risks.*

Hypothesis 2b (H2b). *The relationship between Corporate Social Performance and board gender diversity will be stronger in the more environmentally vulnerable (E-pillar) industries as compared with the ones with less environmental vulnerabilities.*

Hypothesis 2c (H2c). *The relationship between Corporate Social Performance and board gender diversity will be stronger in the more socially vulnerable (S-pillar) industries as compared with the ones with less social vulnerabilities.*

Hypothesis 2d (H2d). *The relationship between Corporate Social Performance and board gender diversity will be stronger in the more governance-related vulnerable (G-pillar) industries as compared with the ones with less governance-related vulnerabilities.*

4. Methods

4.1. Sample and Data

In our study, we have used the data of Chinese firms (A-share), listed on Shanghai and Shenzhen stock exchanges. The data of these firms from the period of 2009 to 2015 has been acquired from China's stock market and accounting research (CSMAR) database and Rankin's (RKS) CSP ratings [69–71]. In the sample of data, researchers selected 2009 as the starting year because many listed firms in China obtained CSP ratings in 2009 after China had faced significant changes in its financial environment following the global financial crisis of 2008. The data of firms with missing values were omitted from the study, which led to a final useable sample of 9390 firm's year observations. We classified the industries into ten (10) categories based on the global industry classification initiative (GIDC), which includes their specific weightage in terms of financial risks attached to their ESG characteristics in the categorization process [23]. We rounded off the values of the ESG attributed risk of a specific industry and assigned the risk factor digit from 1 to 11 accordingly.

4.2. Dependent and Independent Variables

4.2.1. Corporate Social Performance

Corporate Social Performance (CSP) is the dependent variable being employed in the study. To test the hypotheses, we used the CSP rating score as the proxy for corporate social performance. Rankings (RKS) rating is based upon the standards of the Global Reporting Initiative (GRI 3.0). The scores inculcate the three pillars of ESG [72–75]. The reliability and validity of these measures are already being confirmed by different studies [69,70,76].

4.2.2. Board Gender Diversity Variables

Board gender diversity (BGD) is the independent variable. As a proxy for BGD, we employ the percentage of female on the board [45,77]. To account for the critical mass theory, a dummy variable (BCMASS) is also employed to sense the effects of tokenism and critical mass in the relationship between BGD and CSP [78]. The value of BCMASS is taken as "1" if at least three female directors are present on the corporate board and 0 otherwise.

4.2.3. Industry Effects

Apart from the two explanatory variables, we have employed the aggregate level and segregated measures of ESG risk exposure for different industries as moderating variables. IESGRE is the industry level aggregate risk exposure [79], IERE is the industry level environmental risk exposure [80], ISRE is the industry level social risk exposure and IGRE is the industry level governance risk exposure.

4.2.4. Control Variables

We have taken inspiration from the previous literature on the relationship between BGD and firm's CSP while selecting the control variables for this the study [71,81]. Here, we have included (ROA) return on assists [81,82] (Fage) firm age [83], (Fsize) firm size [83,84], Institutions share, (Bsize) board size [85], (SOE) state-owned enterprises, (Fgrowth) firm growth [86], (Growop) growth opportunity, (Fleverage) financial leverage [64,87] and (BINDEP) board independence [88,89].

Finally, we incorporated the year dummies to control for the potential effect of time.

4.2.5. Empirical Model

To test the Corporate Social Performance's relationship with board gender diversity in the context of industry effect, we employ the regression model of ordinary least squares (OLS) which is specified as follows:

$$CSP_{i,t} = a + \beta_1 BGD + \sum_{I=1}^{N} controls_{i,t} + \epsilon_{i,t} \quad (1)$$

$$CSP_{i,t} = a + \beta_2 BGD + \beta_3 IESGRE + \sum_{I=1}^{N} controls_{i,t} + \epsilon_{i,t} \quad (2)$$

$$CSP_{i,t} = a + \beta_4 BGD + \beta_5 IESGRE + \beta_6 BGDxIESGRE + \sum_{I=1}^{N} controls_{i,t} + \epsilon_{i,t} \quad (3)$$

$$CSP_{i,t} = a + \beta_7 BGD + \beta_8 IERE + \beta_9 BGDxIERE + \sum_{I=1}^{N} controls_{i,t} + \epsilon_{i,t} \quad (4)$$

$$CSP_{i,t} = a + \beta_{10} BGD + \beta_{11} ISRE + \beta_{12} BGDxISRE + \sum_{I=1}^{N} controls_{i,t} + \epsilon_{i,t} \quad (5)$$

$$CSP_{i,t} = a + \beta_{13} BGD + \beta_{14} IGRE + \beta_{15} BGDxIGRE + \sum_{I=1}^{N} controls_{i,t} + \epsilon_{i,t} \quad (6)$$

where (*CSP*) indicates a firm's corporate social performance; (*BGD*) is board gender diversity in a firm; (*IESGRE*) refers industry level aggregate risk exposure; (*IERE*) is the industry level environmental risk exposure; (*ISRE*) is the industry level social risk exposure; (*IGRE*) *IGRE* is the industry level governance risk exposure. (*BGD* × *IESGRE*) shows the interaction between *BGD* and *IESGRE*; (*BGD* × *IERE*) shows the interaction between *BGD* and *IERE*; (*BGD* × *ISRE*) shows the interaction between *BGD* and *ISRE*; (*BGD* × *IGRE*) shows the interaction between *BGD* and *IGRE*; while controls refers to firm-level control variables.

5. Results

5.1. Descriptive Statistics and Correlation Matrix

The descriptive statistics have been presented in Table 1. The average value of CSP is 12.746. The mean values of BGD, IESGRE, IERE, ISRE, and IGRE are 0.153, 4.04, 4.30, 4.02, and 3.85, respectively. The correlation between all explanatory variables including control variables has been presented in Table 2.

Table 1. Descriptive statistics.

Variables	Mean	SD	Min.	Max.
CSP	12.746	19.306	0.000	89.297
BGD	0.153	0.220	0.000	1.000
IESGRE	4.041	2.451	0.000	10.000
IERE	4.304	0.468	0.000	10.000
ISRE	4.026	2.110	0.000	10.000
IGRE	3.853	2.268	0.0000	10.000
ROA	0.033	0.516	48.315	4.836
Fage	11.183	5.569	2.00	26.000
Fsize	21.410	1.487	9.044	28.669
InstH	7.570	10.471	0.000	87.89
Bsize	3.505	1.001	1.000	8.000
Fleverage	0.501	1.228	0.007	96.959
SOE	0.529	0.499	0.000	1.000
Fgrow	0.710	1.459	−9.108	35.562
Growop	0.995	1.061	0.001	16.147
BINDEP	0.138	0.101	0.000	0.542
BCMASS	5.131	1.402	0.212	0.083

Table 2. Correlation matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
CSP	1.000																
BGD	0.048 *	1.000															
IESGRE	0.501 *	0.052 *	1.000														
IERE	0.019 *	0.062 *	0.047 *	1.000													
ISRE	0.507 *	0.073	0.570 *	0.037 *	1.000												
IGRE	0.412 *	0.063 *	0.578 *	0.029 *	0.533 *	1.000											
ROA	0.003	−0.005 *	0.003	0.015 *	0.003	0.002	1.000										
Fage	0.156 *	−0.103 *	0.131 *	−0.039 *	0.146 *	0.138	0.026 *	1.000									
Fsize	0.017 *	−0.055 *	0.010 *	−0.041 *	0.012 *	0.011	0.043 *	0.160 *	1.000								
InstH	0.053 *	−0.052 *	0.029 *	−0.024 *	0.041 *	0.038	0.017 *	0.051 *	0.089	1.000							
Bsize	0.033 *	−0.041 *	0.024 *	−0.027 *	0.030 *	0.031	0.006 *	0.120 *	0.101	0.028 *	1.000						
Fleverage	0.005 *	−0.001	0.003	0.000	0.003 *	0.003	0.468 *	0.073	0.018	0.009 *	0.006	1.000					
SOE	0.048 *	−0.064 *	0.039 *	−0.035	0.044 *	0.041	0.002 *	0.364 *	0.280	0.104 *	0.153	0.025 *	1.000				
Fgrow	0.015 *	0.021 *	0.004 *	0.012	0.003 *	0.003	0.099 *	0.062 *	0.07	0.053 *	0.004	0.044 *	0.067 *	1.000			
Growop	0.043 *	−0.040 *	0.040 *	−0.044	0.046 *	0.038	0.014 *	0.188 *	0.465	0.035 *	0.061	0.055 *	0.254 *	0.018	1.000		
BINDEP	0.034 *	−0.104 *	0.073 *	0.483 *	0.057	0.042	0.005	−0.034	0.053	0.039 *	0.043	−0.000	0.046 *	0.02	0.039s	1.000	
BCMASS	0.184 *	0.153 *	0.082	0.012	0.267 *	0.183	0.091	0.158 *	0.282	0.107 *	0.150	0.026 *	0.039 *	0.109	0.02 *	0.182 *	1.000

* Represents 0.05 level significance.

5.2. Correlation Matrix

To check the existence of multi co-linearity, Pearson Correlation analysis is used here. In the following Table 2, all explanatory variables correlate less than 0.60, which shows no issue of multi-collinearity.

5.3. Regression Results

Results of different OLS models have been shown in Table 3. Model 1 shows the direct impact of board gender diversity on corporate social performance indicating the confirmation of hypothesis (H1). The results of Model 2 show the relationship between aggregate level IESGRE and CSP. Model 3 shows the relationship between IESGRE confirming the hypothesis (H2a). The interaction term IESGRE × BGD (t = 3.54, $p < 0.00$) indicates that BGD strengthens the link between Industry ESG Risk Exposure (IEGRE) and CSP. Model 4 confirms hypothesis (H2b) having the interaction term BGD × IERE (t = 3.70, $p < 0.00$) as statistically significant. Model 5 confirms hypothesis (H2c) having the interaction term BGD × ISRE (t = 3.98, $p < 0.003$). Model 6 have insignificant results however the direction of the relationship is matched.

Table 3. Results of all models executed through OLS regressions using the following models, respectively.

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
BGD	10.673 *** (14.80)	6.292 *** (10.38)	7.024 *** (11.23)	4.550 *** (5.93)	3.343 *** (6.27)	5.915 *** (9.86)
IESGRE	----------	−3.916 *** (−63.88)	−4.091 *** (−62.93)	----------	----------	----------
IERE	----------	----------	----------	−3.909 *** (−63.78)	----------	----------
ISRE	----------	----------	----------	----------	−6.058 *** (−90.35)	----------
IGRE	----------	----------	----------	----------	----------	−4.356 *** (−66.02)
BGD×IESGRE	----------	----------	0.536 *** (3.54)	----------	----------	----------
BGD×IERE	----------	----------	----------	1.397 *** (3.70)	----------	----------
BGD×ISRE	----------	----------	----------	----------	0.678 *** (3.98)	----------
BGD×IGRE	----------	----------	----------	----------	----------	0.413 (1.43)
ROA	−0.342 (−1.03)	−0.169 (−0.61)	−0.169 (−0.61)	−0.190 (−0.69)	−0.062 (−0.26)	−0.148 (−0.54)
Fage	0.847 *** (22.41)	0.527 *** (16.49)	0.527 *** (16.49)	0.529 *** (16.58)	0.345 *** (12.25)	0.491 *** (15.49)
Fsize	0.069 (0.58)	0.030 (0.31)	0.030 (0.31)	0.028 (0.28)	0.012 (0.14)	0.021 (0.21)
InstH	0.057 *** (3.91)	0.046 *** (3.81)	0.046 *** (3.81)	0.046 (3.78)	0.031 *** (2.90)	0.039 *** (3.21)
Bsize	0.208 (1.35)	0.196 (1.53)	0.196 (1.53)	0.193 (1.50)	0.155 (1.38)	0.143 (1.12)
Fleverage	−0.246 * (−1.77)	−0.128 (−1.10)	−0.128 (−1.10)	−0.134 (−1.15)	−0.058 (−0.58)	−0.121 (−1.05)
SOE	0.299 (0.85)	−0.000 (−0.00)	−0.000 (−0.00)	−0.004 (−0.02)	−0.131 (−0.51)	0.001 (0.00)
Fgrow	−0.104 (−0.99)	−0.112 (−1.28)	−0.112 (−1.28)	−0.111 (−1.270	−0.124 (−1.62)	−0.114 (−1.32)
Growop	0.318 * (1.91)	0.102 (0.74)	0.102 (0.74)	0.112 (0.81)	−0.021 (−0.18)	0.127 (0.93)
BINDEP	7.540 *** (5.01)	0.602 (0.48)	0.602 (0.48)	−3.866 * (−2.22)	0.147 (0.13)	3.420 ** (2.75)
Constant	35.672 *** (39.59)	33.504 *** (36.39)	35.310 *** (39.02)	33.319 *** (36.01)	17.806 *** (13.57)	18.647 *** (13.89)
YI	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated
R^2	0.2475	0.2483	0.2471	0.2489	0.1179	0.1191

Note: *, **, *** represent significance at 10%, 5%, and 1%, respectively. The T-statistics are represented in parentheses.

5.4. Additional Tests

To investigate further for the insignificant results of the influence of BGD on CSP in the governance-related vulnerable industries, we employed additional tests in terms of two other dummy variables namely "BCMASS" and "BFID", representing Boards' "Critical Mass" presence of female and boards' independent female directors. Upon receiving encouraging results, we further employed another variable namely "BFIDMASS" representing the critical mass presence of female independent directors on corporate board have been shown in Table 4.

Table 4. Impact of the critical mass of female on board, female independent directors on board, and the critical mass of independent female directors in industries with governance-related vulnerabilities.

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
IGRE	−3.956 *** (−66.06)	−4.356 *** (−64.26)	−4.436 *** (−66.54)	−5.255 *** (−46.04)	−6.352 *** (−366.36)	−4.366 *** (−64.32)
BCMASS	10.673 *** (14.80)	----------	----------	3.909 *** (63.78)	----------	----------
BFID	----------	6.292 *** (10.38)	----------	----------	3.343 *** (6.27)	----------
BFIDMASS	----------	----------	14.321 *** (11.23)	----------	----------	5.915 *** (9.86)
BCMASS×IGRE	----------	----------	----------	1.393 *** (3.74)	----------	----------
BFID×IGRE	----------	----------	----------	----------	0.674 *** (3.92)	----------
BFIDMASS×IGRE	----------	----------	----------	----------	----------	0.412 (1.47)
Controls	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated
R^2	0.2475	0.2483	0.2471	0.2489	0.1179	0.1191

Note: *, **, *** represent significance at 10%, 5%, and 1%, respectively. The T-statistics are represented in parentheses.

5.5. Robustness Test

To address the robustness problem, we used an alternate measure for BGD known as the Blau index [90], which uses probabilistic reasoning for evaluating diversity, which is shown in Table 5.

5.6. Endogeneity

The previous literature depicts that the structure of the corporate board is exogenous at par while the composition of the board is reported to be somewhat endogenous in case of governance interventions [91] having the potential of estimation problems [92].To address the issue of potential endogeneity, we employ the two-stage least square analysis in Table 6.

Researchers have applied this method to spot the instrumental variables that can assure the exclusion restriction. Following Bruynseels and Cardinaels [92], the lag is used in the first phase, than the average of the industry is used in the next phase and finally the industry average of BGD and lagged values are both used as an instrumental variable. This method has the special provision of allowing two dependent variables i.e., CSP and BGD to be endogenous [93]. The results of 2SLS suggest a significant association between CSP and the interaction between BGD and risk exposures of industry groups (t = 2.637, $p < 0.005$). This confirms our main results (Table 3 Model 3–6) that BGD is strongly linked with CSP in the more environmentally, socially governance wise at-risk industry group and supports Hypothesis (2a)–(2d).

Table 5. Robustness test (incorporating Blau Index).

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
BGD	11.236 *** (12.12)	6.229 *** (10.42)	3.787 *** (11.56)	10.258 *** (13.39)	3.454 *** (5.98)	6.091 *** (9.98)
IESGRE	----------	−5.102 *** (−41.83)	−1.282 * (−2.13)	----------	----------	----------
IERE	----------	----------	----------	−2.106 *** (−4.70)	----------	----------
ISRE	----------	----------	----------	----------	−6.059 (−42.88)	----------
IGRE	----------	----------	----------	----------	----------	−4.359 *** (−42.63)
GD×IESGRE	----------	----------	2.637 *** (4.49)	----------	----------	----------
BGD×IERE	----------	----------	----------	1.389 *** (3.73)	----------	----------
BGD×ISRE	----------	----------	----------	----------	0.679 ** (3.79)	----------
BGD×IGRE	----------	----------	----------	----------	----------	0.417 (1.48)
Controls	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated
YI	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated	Incorporated
R^2	0.2486	0.2490	0.2430	0.2499	0.119	0.117

Note: *, **, *** represent significance at 10%, 5%, and 1%, respectively. The T-statistics are represented in parentheses.

Table 6. Two-stage least square (2-SLS) analysis.

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
BGD	6.295 *** (10.45)	3.676 *** (10.45)	9.162 *** (13.28)	3.358 *** (6.47)	5.929 *** (10.57)	10.677 *** (15.22)
IESGRE	----------	3.919 *** (44.80)	1.282 * (2.13)	----------	----------	----------
IERE	----------	----------	----------	14.016 * (2.24)	----------	----------
ISRE	----------	----------	----------	----------	10.940 (8.26)	----------
IGRE	----------	----------	----------	----------	----------	11.160 *** (6.36)
BGD × IESGRE	----------	----------	2.637 *** (4.49)	----------	----------	----------
BGD × IERE	----------	----------	----------	3.727 ** (2.65)	----------	----------
BGD × ISRE	----------	----------	----------	----------	0.677 ** (3.87)	----------
BGD × IGRE	----------	----------	----------	----------	----------	0.529 (2.47)
R^2	0.2464	0.2420	0.2427	0.2499	0.1328	0.1786

Note: *, **, *** represent significance at 10%, 5%, and 1%, respectively. The T-statistics are represented in parentheses.

6. Findings and Discussion

The effect BGD has on CSP is relatively an understudied phenomenon despite Chinese-wide endeavours to encourage gender diversity in the corporate boards. The purpose of this research was to tunnel through the relationship between BGD and CSP in terms of environmental, social, and governance risk exposure. This study was based on 9390 firm-year observations that offer a sturdy empirical indication that BGD is positively associated

with the CSP of firms, hence leveraging an imminent view of mixed results provided by the earlier studies [44].

Following Lu and Herremans [12], we investigated the industry effect in the relationship between BGD and CSP. The main issue with previous studies in this stream of research is the use of simplistic parameters, focus on CSR's single dimension, and an aggregate and combined measure of CSP, which led to the mixed and varied results for the association between BGD and CSP [5,12,56,60,61,94–97]. In contrast, we employed a rigorous research design for the segregated analysis of the industry effect. The industry effect, simultaneously in terms of aggregate and segregated ESG risk exposures, suggested a more corporeal inculcation of the context of different industries in terms of their economic impact, based on instrumental stakeholder theory. The classy statistical techniques of alternative measures for ensuring robustness and 2SLS for tackling concerns of endogeneity are employed to ascertain the findings.

The industries with more aggregate ESG risk showed a strengthened relationship between BGD and CSP. At a narrower level, the segregated relationships suggested the strength of the relationship in industries with more environmental and social risk exposure. No significant effect was found in the governance pillar. The strengthened relationship in industries with environmental risk exposure implies the overall influential role of females on board in mitigating the risks concatenated with climate change, biodiversity and land use, water stress, pollution and waste, financing environmental impact and environmental opportunities. Similarly, in industries with social risk exposure, the strengthened relationship fosters the overall influential role of females on board in mitigating the risks concatenated with the management, health and safety and development of human capital, stakeholder opposition, product liability, and social opportunities.

Unlike the financial performance, we show that, in general, firms have no need of a threshold number as the critical mass of female directors on corporate board to promulgate the improvements except for industries with governance-related risk exposure. Following [80], the relatively insignificant results in the industries with governance risk exposure were further investigated for tokenism and swap between females' executive and monitoring roles. It was found out that the presence of a threshold number of females on the board led to strengthening the relationship between BGD and CSP in industries with governance risk exposure. In addition, the investigation for the monitoring role of females on board in terms of independent directors resulted in further strengthening the relationship. This finding suggests the marginalized executive role of females on boards in governance-related CSP. Their role seems to be influential in governance-related issues of CSP when they are in considerable numbers, i.e., critical mass effect. Additionally, it is influential when they are not dependent upon the endorsement of members on board for their promotion (independent member), as some studies have reported females' undemonstrative and reticent attitude due to their tough promotional pattern in career paths [81,98].

Implications

Our findings have practical, regulatory, and theoretical implications. These findings imply that the board gender diversity is not only helpful in the promotion of equal opportunities in the firms but also increase their corporate social performance while considering multiple stakeholders in light of instrumental stakeholder theory. Moreover, it suggests that including a single female director on a corporate board has the potential to cause improvements in the firm's environmental and social risks connected CSP. Our results also highlight that the presence of a threshold number of female independent directors has also the potential to cause the same improvement in terms of governance-related risk mitigation in terms of firm's CSP. Along the lines of [96], our findings negate the notion of independent directors' presence on corporate boards as a modus operandi in terms of improvement in ESG risk related CSP. The mere inclusion of independent directors as a source of a firm's objectivity and efficiency may not suffice in the instrumental stakeholder

theory's perspective and board gender diversity is a better claimant for the purpose in light of our empirical evidence. Managers and shareholders may perk up CSP of industries with environmental and social risk exposure ensuring only one female director on the corporate board at par. In addition, they can hatch similar achievements in industries with governance risk exposure while ensuring a threshold number of female independent directors on the corporate boards of the firms of these industries. The results also assist policymakers in promulgating the legislation to encourage female's presence on corporate boards to leverage environmental, social, and governance-related welfare for all stakeholders in general and society specifically [99].

The study has also some theoretical implications in the shape of extension and convergence of the assumptions of resource dependence theory and upper echelon theory to the domain of gender diversity. The umbrella of instrumental stakeholder theory encompasses the whole framework for leveraging the hatched benefits to the economic benefits of all the stakeholders. The monopoly of agency theory in the explanation of corporate social performance is challenged as the role of gender diversity offers an alternate explanation in terms of inculcation of female directors instead of relying on gender-indifferent independent directors. We also pitch into the critical mass theory as we have found that, on the contrary to the assumptions of the critical mass theory, the presence of a mere single female on the corporate board could also enliven corporate social performance in the majority of industries. The assumptions of critical mass are held in the findings of industries with governance risk exposure.

7. Conclusions, Limitations, and Future Work

This study extends the literature of board gender diversity while incorporating the industry effect into the analysis. The results of this study indicate that the context of the industry fosters differentiated challenges to the firms and its boards in terms of CSP and, therefore, diverse skills and expertise are required to cope with these challenges. Drawing upon the resource dependence and upper echelon theory for the top management team's dynamics, instrumental stakeholder theory for the materialization of corporate social performance in ESG risk perspective and industry effect we hypothesized that the corporate board's gender diversity has a direct relationship with corporate social performance and that the relationship is strengthened in industries with more ESG risk exposure (both aggregated and segregated). The critical mass and director independence perspective [81,100] has also been employed for the in-depth investigation of industries with governance-related risks.

The findings of this research are in line with the resource dependence theory in terms of provision of a vigorous blend of resources to the corporate boards [19] and with upper echelon theory in terms of the active role of top management team in the performance of a firm [101,102]. The critical mass effect and directors' independence effect did not count for industries with environmental and social risk exposure; however, it did count for industries with governance risk exposure.

There are certain limitations to our research, which are enumerated as follows. First of all, we have used the data of Chinese (A-listed) firms, which is an emerging market and a developing economy; therefore, the results of our study may not be generalizable. Future research could examine if similar results occur in a different institutional context such as the one where there is a mandatory quota system for female representation on corporate boards. There is also an avenue of comparing the institutional contexts whereby the board gender diversity is mandatory with those where it is not. This will explore the pros and cons of forced and voluntary women representation on corporate boards. The comparison may also be done between the context of developed and emerging economies. Apart from that, several other kinds of diversity can be worked out for industry effect from the perspective of ESG risk exposure.

Secondly, we have inculcated only the critical mass and director independence factors while investigating the insignificant results of industries with governance risk exposure.

Other institutional factors like state-owned enterprises, ownership concentration and family-owned firms may also be considered in future studies. Thirdly, we have utilized only the quantitative approach for our study. Combining survey data with in-depth interviews or certain other qualitative methods may result in more insightful outcomes as different studies have already called on researchers for working on boardroom's behavioral processes and dynamics [103–106]. Fourthly, our study focus on ESG risk parameters of Morgan Stanley Capital International (MSCI) and Standards and Poor's (S&P) whereby the weights to the constituent parameters of risk exposure are assigned in the perspective of economic impact. Certain other categorization typologies may also be inculcated to increase the robustness of the study and also open up new ways of categorization from the perspective of corporate social responsibility.

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