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The moderating role of CSR in board gender diversity and firm financial performance: empirical evidence from an emerging economy

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ABSTRACT

The current study aims to investigate the moderating role of corporate social responsibility (CSR) in board gender diversity and firm financial performance. We used the panel data regression (fixed effect) in our analysis to check the moderating role of CSR in the board gender diversity and the firm financial performance. We collected the data of Chinese listed companies from the Shenzhen and Shanghai stock exchanges from the China stock market and accounting research (CSMAR) database. We used a two-stage least square (TSLS) regression model to control the possible problem of endogeneity. Our results show that higher representation of female directors in the board is positively related to firm financial performance and that CSR has a significantly positive effect when moderating the relation between board gender diversity and firm financial performance. Besides, three control variables (board size, board member average age, and Big4) have a positive impact on the firm performance, having the leverage variable a negative impact on the firm performance. Our findings hold for a set of robustness tests. This study has important implications, namely by enriching the existing literature on CSR and by highlighting the importance of board gender diversity, and emphasizing the importance of the reporting of more CSR activities and its impact on the decision-making process.

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1. Introduction

Corporate social responsibility (CSR) reporting is a very important instrument to increase accountability for stakeholders (Chen and Wan, 2020; Gray et al., 2001; Sial, Zheng, Khuong, et al., 2018). Nowadays, firms work in an environment in which the implementation of responsibility is a requirement to compete, being CSR a vital strategic factor (Garrigues Walker and Trullenque, 2008). The management of moral values, norms, and principles became a necessity for companies, aiming to maintain their project in the medium and long term. From the stakeholders theory perspective, firms must establish policies and systems on which a wide range of stakeholders are included (Lafuente et al., 2003). CSR disclosures provide opportunities to meet the expectations of the shareholders and stakeholders (Schreck, 2013). Firms with a superior CSR record can get a better response from regulators and an encouraging coverage from media (Aerts and Cormier, 2009), which facilitates the firm to get a better reputation (Bebbington et al., 2008). The process of creating and maintaining a superior connection with stakeholders can award a competitive advantage for companies to increase sales and profits and attracting new shareholders (Gray, 2006). CSR reporting in the organization encourages managers in strategic planning, governance, decision making, risk management processes (Adams, 2008; Bebbington et al., 2008; Hasan et al., 2018). CSR disclosure increases the accuracy of the earning forecasting of financial analysts (Dhaliwal et al., 2012).

A greater female representation on the companies' boards represents a higher company's commitment with the CSR performance (Sial et al., 2019). There is also a positive relationship between diversity in board and its effectiveness and overall performance (Bonn et al. 2004; Rao & Tilt, 2016). The strategic management of stakeholders, in the important approach through which companies manage their relationships with customers, society, employees, shareholders, and even potential shareholders, is also becoming a critical characteristic of CSR. Socially responsible companies try to develop better and sound relationships with stakeholders like employees, shareholders and customers, ultimately leading to a better overall financial performance (Chen and Wang, 2011; Davis, 1973; Turban and Greening, 1997).

The development of China is significantly fast, what is done at the cost of social and ecological aspects that are adverse to the country (Lin and Ho, 2011; Tang and Li, 2009). Disclosures and other CSR practices are underlying stages in China. Big international companies and domestic enterprises brought down their labor and ecological values, strongly harming the atmosphere. It is the case of Gap, Mattel, or Nike, for example. These companies found there an important business motivation for shifting their operations to China (Tang and Li, 2009).

There are important ruptures of the code of business morals, reflecting an ordinary working style adopted in China. For instance, there have been breaks of sanitation guidelines (Tang and Li, 2009; Zhou, 2011), an inordinate advancement and utilization of cigarettes and tobacco (Cai and Wang, 2010), an exorbitant use of composts (Wu, 2011), and a damaging use of the world patent and trademark regulations (Tian and Chao, 2011). The worldwide society has raised genuine concerns about these issues.

China has suffered the pressure for its methodologies towards deficient natural, moral, trademark, and other social issues. Specialists - including accounting experts, the trade network, and scholars - proposed that China should have its standards about the society and environment, following different national principles concerning these issues (Sial, Zheng, Cherian, et al., 2018; Tang and Li, 2009).

Moreover, China has extended laws and reforms on corporate governance area to adapt them to the global institutional requirements. From the internationalization point of view, worldwide enterprises working in China are required to adjust to worldwide accepted ecological, ethical, and social standards (Fang, 2010; Hongwei and Ping, 2011; Zhou, 2011). Currently, China is expected to determine and improve national social and environmental issues; since 2006, numerous guidelines have been made and upheld in terms of letter and spirit, aiming to improve and resolve the environmental and social issues of the country. Many standards are made and enforced in true letter and spirit. Organizations are investigating and are also required to show that their activities are as indicated by principles, not managed according to pressure groups' agendas.

Components like listing status, the structure of ownership, and enhancements in corporate governance enactment impact on the revealing conduct of Chinese firms (Cheung et al., 2010). The accounting bodies and worldwide market weights are factors compelling the CSR revealing homogeneity, while cultural, social and economic aspects are the factors that cause the heterogeneity components in CSR practices in China. These authors propose that CSR approaches in China are basically different from the ones of many other nations.

Our study has two main objectives. The first one is related to the following question: does the gender diversity in the board lead to an increase in the firm financial performance? The second one concerns the following question: does CSR moderate the relationship between gender diversity in board and firm financial performance?

Our research contributes to the existing literature in following ways. First, the past literature is mostly related to financially developed countries and CSR issues in the context of other cultures and fittings that are different from the one of China (Clacher and Hagendorff, 2012; Jo and Harjoto, 2011; Muller and Kolk, 2010), i.e., developing countries' settings on this issue are our primary contribution. Second, most of the studies in China used survey methods, which may have problems of non-response and of sample representation (Chen and Wang, 2011; Qu and Leung, 2006); accordingly, we included all listed firms with CSR reports in our sample. Third, most of the previous works do not study how gender diversity in board and CSR impact on the company financial performance (De Villiers et al., 2011; Hung, 2011; Walls et al., 2012), having very few studies considered three variables together (Arora and Dharwadkar, 2011; Jo and Harjoto, 2011; Sahin et al., 2011). The study of the moderating role of CSR between board gender diversity and firm financial performance lacks in previous studies, which is the main innovation of our study. This is not only relevant for Chinese companies but also relevant for foreign and potential investors who are planning investments in Chinese entities.

The rest of the paper is organized in different parts. Part 2 approaches the literature review and hypotheses. Part 3 relates to the research methodology. Part 4

describes empirical results and the discussion. The last part, part 5, concludes, also shows the implications of the study and gives clues for further future research.

2. Literature review and hypotheses development

2.1. Boardroom gender diversity and firm performance

According to the agency theory perspective, the representation of female directors on the board brings unique ideas to resolve the many issues and biases related to the information on the development of new strategies (Francoeur et al., 2008). The role of female directors on the board is more effective when compared to male directors (Martín and Herrero, 2018; Virtanen, 2012).

It is usually assumed that the central role of the board is directed to decrease the agency cost arising from the principal and agent, being the objective maximizing the shareholder wealth (Riordan and Williamson, 1985). The aim is basically to guarantee that investors, who are the founders of firms, get enough return on their ventures (Shleifer and Vishny, 1997). From the agency theory and stakeholders perspective, Hill and Jones (1992) concluded that the board assumes a vital role when deciding on the sustainable action of a company and on its responsibility to various interest teams.

Female representations are also known for their higher moral principles at the board level (Pan and Sparks, 2012), when considering the questions regarding unethical behaviors (Bilimoria and Wheeler, 2000); women have a teamwork effectiveness and a participative leadership style (Eagly and Johnson, 1990); usually, they discuss issues in more detail than men (Ingley and Van Der Walt, 2005). All the mentioned factors lead to an enhanced women's performance in these situations.

There are mixed results in the literature about boardroom diversity and about the firm's performance (Post and Byron, 2015). Some papers have shown an inverse association between board gender diversity and the firm financial performance. (Ahern and Dittmar, 2012; Matsa and Miller, 2013) and some other authors showed that exists no association between the above mentioned variables (Jurkus et al., 2011). The difference in results of the mentioned studies may be due to different research methodologies, statistical tools and techniques, and timeframe selection.

Adler (2001), composed a sample of 500 firms and found a strong relationship between women-friendliness and their corporate performance. This relationship is also supported by other researches (Terjesen et al., 2016). Carter et al. (2003) and Campbell and Mínguez-Vera (2008) showed a positive relationship between a higher percentage of female directors on the board and market performance. Similarly, (Bear et al. (2010), Borlea et al. (2017)) proved that female directors promote CSR and a better firm performance, particularly when women are three or more. Liu et al. (2014) reported that the presence of three or more women on the board may lead to a stronger impact on the board when compared to boards with one woman. Rosener (1995) explained the positive effect of the presence of females on the board of directors by their flexibility, which leads to the better capability of managing uncertain situations.

In light of this brief review, the following working hypothesis is stated.

H1: Boardroom gender diversity has a positive effect on firm performance.

2.2. The moderating role of CSR

CSR reporting is receiving significant consideration over the past years resulting from the CSR relationship with the firm's performance (Margolis et al., 2007; Orlitzky et al., 2003). According to McWilliams and Siegel (2001), the focus of corporate social responsibility is a cost-benefit analysis. It is important to evade the additional cost that consequently does not generate income and has an inverse impact on the firm's financial performance. Mainly, corporate social responsibility aims to reduce the agency problem. Corporate social responsibility is often used as a way of cooperation by firms which intentions have social and moral ends and for avoiding quarrel of interests between managers, stockholders, and other stakeholders (Chen et al., 2020).

Bear et al. (2010) found that female directors bring many benefits to boards, which leads to the improvement of CSR reporting. Companies with more female directors lead to high corporate philanthropy and vice versa (Nkemjika and Nkechi, 2017; Williams, 2003). Similarly, Krüger (2009) supported the results got by authors like Bear et al. (2010) or Williams (2003). Galbreath and Shum (2012) concluded that, in Australia, females are more engaged with various stakeholders due to relational capabilities and to respond to stakeholders needs, demonstrating a CSR accomplishment. A variety of other findings also exist, showing that female directors put the focus on the impact of different facets of CSR, like charity, for instance (Mansaray et al., 2017), or on the environment.

Thus, knowing that board gender diversity has a positive effect on the firm financial performance (Adler, 2001; Carter et al., 2003; Harjoto et al., 2015; Gupta et al., 2015; Huang, 2013; Post and Byron, 2015), it is reasonable to assume that the CSR moderates the relation between board gender diversity and firm performance, which gives room for the following hypothesis.

H2: CSR moderates the relation between board gender diversity and firm financial performance.

3. Research methodology

3.1. Sample and data

We took all nonfinancial listed companies on Shanghai and Shenzhen stock exchanges for the time-span of 2010–2019 from China stock market and accounting research (CSMAR) database. Given the special characteristics of financial and insurance firms, we restricted our sample to all non-financial companies. After this filtering, we considered the final sample of 6029 unbalanced firm-year observations and collected the yearly basis data.

3.2. Measurement of dependent and independent variables

We used the Tobin Q as a dependent variable. By following previous studies, we measured it considering the total assets market capitalization minus book value of

equity divided by total assets. We used the Blau index (BI) as an independent variable, being measured by using the following formula: $1 - \sum_{i=1}^n P_i^2$. The Blau index is the superior measure of board gender diversity if compared to the proportion of female directors (Blau, 1977).

Return on equity is used as an alternative measure for the financial performance, as suggested by Orlitzky et al. (2003) and followed by Margolis et al. (2007) and Wang et al. (2014). ROE reveals the extent of profits generated by the capital invested in the company. It is considered a common measure for evaluating the firms' CSR based financial performance. It is calculated by dividing the income attributable to shareholders by the shareholder's equity. The lag effect of the CSR on the ROE was measured using a lag of one year, as held by (Brammer et al. (2007), Peng et al., 2009).

We used the CSR disclosure index for moderator variable. Previous studies used a dichotomous score (Aburaya, 2012; Chau and Gray, 2002; Haniffa and Cooke, 2005; Sial, Chunmei, et al., 2018). The scoring criteria range from 0 to 1 (from firms that do not provide environmental disclosures and sustainability to the firms that provide them – got from CSMAR).

3.3. Measurement of control variables

In line with previous studies, as the ones by (Khan and Vieito (2013), Abdullah et al. (2011), McWilliams and Siegel (2001)), and to measure the effect of control variables on the firm performance, we included board size, foreign institutional investor, female CEO, female Chairman, Big4, board member average age, board member meeting frequency, CEO power, and leverage variables. Table 1 provides the list of all variables with the respective measurements.

A first variable, the size of the organization, is considered as presented in most of the researches on the topic of firm performance (Wu et al., 2009). McWilliams and Siegel (2001) state that a large entity has a greater pool of financial and human resources. These resources can be spent on CSR activities, which are obviously abundant compared to smaller entities. The natural log of total assets of the organization was used as representative of the size of firms. A second one is the power of CEO, as CEOs with a greater level of power can divert the resources from activities such as CSR as they deem that these activities have much longer payback time; thus, these resources are diverted to activities with a shorter payback period such as commercial activities, which leads to the increase of the firm performance (Galbreath and Shum, 2012). We used code 1 for cases where the CEO also held the position of Chairman, and 0 for cases where both offices were separate. The third is "large board". By increasing the board size, there is a positive impact on the firm's performance (Nielsen and Huse, 2010). It is measured by accounting the total board members.

It is suggested that directors who meet more frequently are more likely to well perform their duties. Thus, we are expecting a positive relationship between board member meetings and the firm performance. We follow Larcker et al. (2007) and measure meetings by the total number of meetings conducted in one year. Follows a detailed description of the variables, in Table 1.

Table 1. Variables definition.

Variable Name	Abbreviation	Description
Tobin q	<i>TQ</i>	We measure it as the total assets market capitalization minus book value of equity divided by total assets .
Board gender diversity (Blau Index)	<i>BI</i>	We measure the blau index (<i>BI</i>) by using this formula as $1 - \sum_{i=1}^n P_i^2$ where P_i is a percentage of women and men in the board and n is 2 describing the number of categories (women and male).
Proportion of female directors	<i>PFD</i>	Defined as the proportion of female directors on the board
Shannon Index	<i>SI</i>	We measure the Shannon index by using this formula as $-\sum_{i=1}^n P_i \ln P_i$ where P_i is the proportion of women and male in the board and n is 2 describing the number of categories (women and men).
Corporate social responsibility reporting index	<i>CSR</i>	We measure the CSR by using a dichotomous method whereby a firm is awarded: 1 if an item is disclosed, and 0 if it is not disclosed; the total score of the CSR index has been computed based on the following formula $\sum_{i=1}^n \frac{x_i}{n} \times 100$
Board size	<i>BS</i>	Board size is defined as the total number of directors on the board
Foreign institutional investors	<i>FII</i>	Used as a dummy variable, if foreign institutional investors exist in the firm then the value assigned is 1, otherwise is 0.
Female chief executive officer	<i>FCEO</i>	Used as a dummy variable, if female CEO exists in the firm then the value assigned is 1, otherwise is 0
Female chairman	<i>FChair</i>	Used as a dummy variable, if a female Chair exists in the firm then the value assigned is 1, otherwise is 0
Big4	<i>Big4</i>	If the audited firm has financial reports from big4 audit firm then the value assigned is assigned 1, otherwise is 0
State owned enterprises	<i>SOE</i>	Used as a dummy variable, if the firm is controlled by the state then the value assigned is 1, otherwise is 0
Board member average age	<i>BMAA</i>	Average age of board members
Board member meeting frequency	<i>MMMF</i>	Total number of board member meetings in one year
CEO power	<i>CEOP</i>	If both the CEO and Chairman are the same then the value assigned is 1, otherwise is 0
Leverage	<i>LEV</i>	Total loan divided by total assets

Source: Calculations by the authors.

3.4. Model estimation

We tested the moderation hypothesis of CSR on the relation between board gender diversity and firm financial performance. By following Sial, Zheng, Cherian, et al. (2018), we used fixed-effect regression as a base methodology to estimate the following regression equation.

$$TQ_{it} = \beta_0 + \beta_1 BGD_{it} + \sum_{i=1}^n \beta_n CV_{it} + \varepsilon_{it} \quad (i)$$

$$TQ_{it} = \beta_0 + \beta_1 BGD_{it} + \beta_2 BGD * CSR_{it} + \sum_{i=1}^n \beta_n CV_{it} + \varepsilon_{it} \quad (ii)$$

In equation, (i) *TQ*, representing the Tobin Q, is the proxy to measure the firm financial performance. *BGD*, representing the board gender diversity, is the proxy used to measure the gender diversity in the board. β_0 is the intercept of firm financial

performance, β_1 is the coefficient of the independent variable, and $\sum_{i=1}^n \beta_n CV_{it}$ represents all control variables related to firm financial performance. ε_{it} represents the standard error. In equation (ii), TQ, representing the Tobin Q, is the proxy to measure the firm financial performance. BGD, representing the board gender diversity, is the proxy used to measure the gender diversity in the board. β_0 is the intercept of firm financial performance, β_1 is the coefficient of independent variable (BGD), β_2 is the coefficient of moderating variable (BGD*CSR) and $\sum_{i=1}^n \beta_n CV_{it}$ represents all control variables related to firm financial performance. ε_{it} represents the standard error. The description of the variables is in the [Table 1](#).

4. Empirical results and discussion

4.1. Descriptive Statistics

[Table 2](#) presents the descriptive statistics. The mean value of TQ is 1.663, with a standard deviation of 1.846. The average value of the Blau index is 0.184, and the mean value of CSR is 0.729. The average value of foreign institutional investors is 0.143, with a standard deviation of 0.340. This means that there are foreign institutional investors in 14% of Chinese companies. The average value of CEO power is 0.169, with a standard deviation of 0.083. It means that around 83 percent of the positions of CEO and chairman are separated positions in Chinese companies. The mean value of board member average age, board member meeting frequency, and leverage are 50.27, 9.866, and 0.489, respectively. The descriptive statistics can be found in [Table 2](#) (below).

4.2. Correlation matrix

[Table 3](#) presents the correlation matrix. For studying multicollinearity, an implicit assumption that is made when using the pooled regression method is that the explanatory variables are not correlated with one another. In effect, the correlation between explanatory variables will be non-zero; however, a problem occurs when the explanatory variables are very highly correlated with each other. By looking to the correlation matrix ([Table 3](#)), all correlation coefficients are lower than the threshold level of 0.8. So, no multicollinearity problem can affect findings. As well as according to the variance inflation factor analysis (VIF) in [Table 3](#), for each variable, the value is lower than the thumb of the rule which lessens multicollinearity concerns.

4.3. Multivariate analysis

4.3.1. Results and discussion

[Table 4](#) describes the regression results of equation (i) and (ii). [Table 4](#), model 1, represents the effect of the female director (Blau index) on the firm financial performance. The coefficient of board gender diversity proxy (BI) are positive and highly significant at 5 percent level ($\beta=.390$, $p<.05$), indicating that female directors can enhance a company's financial performance. This finding confirms our first hypothesis that a female director has a positive effect on the firm financial performance.

Table 2. Descriptive statistics.

Variable	Obs	Mean	Std,Dev	Maximum	Minimum
TQ	6029	1.663	1.846	5.053	0.045
BI	6029	0.184	0.159	0.50	0.0
CSR	6029	0.729	0.138	1	0.1
BS	6029	8.525	2.319	12	4
FII	6029	0.143	0.340	1	0
FCEO	6029	0.065	0.247	0.08	0.012
FChair	6029	0.037	0.189	0.065	0.001
Big4	6029	0.155	0.352	1	0
SOE	6029	0.589	0.479	1	0
BMAA	6029	50.27	2.816	80	29
BMMF	6029	9.866	3.141	13	2
CEOP	6029	0.169	0.083	1	0
Lev	6029	0.489	0.186	1.84	0.007

Note: For a detailed explanation of variables see Table 1.

Source: Calculations by the authors.

This finding is consistent with the majority of the previous studies, which also reported that gender diversity in the board has a positive effect on firm financial performance (Gupta et al., 2015; Huang, 2013; Jo and Harjoto, 2011). Our findings also support the stakeholder and gender socialization theory, that is, women show better communal and ethical values through their social roles than men. Our empirical results confirm that female directors are effective monitors and positively related with CSR reporting.

According to our results, there is a significant positive relationship between board gender diversity and firm performance. Our results are in line with those of Bear et al. (2010), Zhang et al. (2013), Post and Byron (2015). Female directors have also a positive impact on CSR performance; they add value to the existing human capital of the company in terms of their skills, knowledge, and competency, that supports the resource dependence theory. This notion is also supported by Carter et al. (2003) and Erhardt et al. (2003). These authors mention that females tend to have a stronger perception of ethics when compared to the male gender, and thus they are more likely to engage the slack resources towards noncommercial activities such as CSR (del Carmen Briano-Turrent and Rodríguez-Ariza, 2016). Due to the differences in professional and academic backgrounds, women can incorporate new perspectives when often these perspectives are ignored by men. This diversity in the mindset also contributes to a better decision making (Trinidad and Normore, 2005, Krishnan, 2012) and to improvements in corporate governance (Elstad and Ladegard, 2012, Achim et al., 2015), which in turn allows to improve the performance of companies (Pucheta-Martínez et al., 2016, Javeed and Lefen, 2019).

In Table 4, model 2, we add the interaction variables ($BI*CSR$) to investigate the moderating role of CSR on the relationship between board gender diversity and firm financial performance. The coefficient of $BI*CSR$ is positive and significant at 5 percent level ($\beta = 1.387$, $p < .05$), which means that CSR moderates the relationship between board gender diversity and firm financial performance. This finding supports our second hypothesis. This result is in line with previous empirical studies (Allouche 2006; Simpson and Kohers 2002). A better firm performance is, therefore, more likely to lead to surplus financial resources (Amato and Amato (2007), which can allow the firm to invest more in any of the aspects of CSR (Campbell, 2007; Waddock and

Table 3. Pearson correlation.

	TQ	BI	CSR	BS	FII	FCEO	FChair	Big4	SOE	BMAA	BMMF	CEOP	Lev	VIF
TQ	1.000													1.25
BI	0.0745 **	1.000												1.11
CSR	0.0361 **	0.0709**	1.000											1.05
BS	0.2195 *	0.0297 *	0.1108***	1.000										1.16
FII	0.0257**	0.0127 **	0.0473***	0.1117 **	1.000									1.05
FCEO	0.0054	0.1939***	0.0095 **	0.0279 **	0.0353	1.000								1.07
FChair	0.0448 **	0.1667 *	0.0274 *	0.0433**	-0.0030***	0.1435 *	1.000							1.05
Big4	0.1876 *	-0.0740 *	0.1409***	0.2649***	0.1780 ***	0.0103 **	-0.0577 **	1.000						1.17
SOE	0.2263***	0.1632 **	0.0770***	0.1937 ***	0.0873***	-0.1043 *	-0.0566 **	0.1674***	1.000					1.18
BMAA	0.1112 *	0.0980 **	0.0630***	0.0628***	0.0159	-0.0623	-0.0250 **	0.0724 ***	0.1535 ***	1.000				1.04
BMMF	0.0840 **	0.0509***	0.0437 **	0.0235***	-0.065 ***	0.0277 **	0.0280 *	0.0612 ***	-0.0722**	-0.0359 ***	1.000			1.07
CEOP	0.1438 *	0.0804***	0.0693***	0.1416 **	0.0209**	0.0048**	0.0207 **	0.0799***	0.2309***	0.0650***	0.0127	1.000		1.07
Lev	-0.5143*	-0.0647**	-0.1314 *	-0.2577	0.0343 **	0.0009**	-0.0252 *	0.2277***	0.2129**	0.0737***	0.1920	-0.125	1.000	1.21

Note: n = 6029, ***, ** * represents $p < 0.01$, $p < 0.05$, $p < 0.1$.
Source: Calculations by the authors.

Table 4. Moderating role of CSR on the relation between board gender diversity and firm financial performance.

Variables	Model 1 (TQ)		Model 2 (TQ)	
	Coef.	p-Value	Coef	p-Value
BI	0.390**	0.042	1.872	0.121
CSR	—	—	0.586**	0.016
BI*CSR	—	—	1.387**	0.013
BS	0.065***	0.000	0.055***	0.000
FII	0.011	0.874	0.008	0.902
FCEO	0.092	0.335	0.093	0.326
FChair	0.237**	0.046	0.145**	0.048
Big4	0.178***	0.003	0.198***	0.003
SOE	0.215***	0.000	0.212***	0.000
BMAA	0.028***	0.000	0.396***	0.000
BMMF	0.073	0.232	0.059	0.264
CEOP	0.162***	0.009	0.162***	0.007
Lev	−3.916***	0.000	−3.823***	0.000
Industry	YES		YES	
Year	YES		YES	
No of Obs	6029		6029	
R ²	36.56		34.27	

Note: ***, **, and * represent $p < 0.01$, $p < 0.05$, $p < 0.1$. For detail explanation of variables see Table 2.

Source: Calculations by the authors.

Graves, 1997) and strengthens the relation between gender-diverse board and CSR reporting. This result also supports the slack resources theory suggested by (Cyert and March, 1963; Julian and Ofori-dankwa, 2013; Surroca et al., 2010; Waddock and Graves, 1997), because corporations are more likely to be involved in CSR activities with slack financial resources.

Overall, the control variables are steady with the past studies (Gray et al. 2001; Neu et al. 1998; Patten, 1991; Roberts, 1992). The CEO power has a positive relation with firm performance, which means that when the CEO has a dual role of chairmanship and CEO, it leads to the increasing performance of the corporation, and the efficiency of the board increases as a consequence of the domination of the CEO (Firth et al., 2007). A positive relationship exists between the firm size and the firm financial performance, at 1 percent level of significance. This means that larger corporations have more firm performance (Andrew et al., 1989; Teoh and Thong, 1984; Trotman and Bradley, 1981). Big4, state-owned enterprises, and board member average age have also a positive relationship with the firm financial performance. We found a negative relationship between leverage and the firm's performance (Branco and Rodrigues, 2008; Reverte, 2009). According to the Waddock and Graves (1997) slack resource theory, there is a negative relationship between debt ratio and firm financial performance, because firms with high leverage always focus on short-term goals, instead of on the long-term performance of the corporation.

4.4. Robustness tests

4.4.1. An alternative measure of boardroom gender diversity

Table 5 represents the assurance of the robustness of our results. We used two alternative measures of board gender diversity, the number of proportion of female directors (PFD) and Shannon index. Coefficients of PFD and SI remain significantly positive at 5 percent level ($\beta = 2.224$, $p < .05$, $\beta = 0.356$, $p < .05$), and the coefficient of

Table 5. Robustness tests: alternative measures of board gender diversity.

Variables	Model 1 (TQ)		Model 2 (TQ)	
	Coef.	p-Value	Coef	p-Value
PFD	2.224**	0.012	–	–
CSR	0.561**	0.012	0.192**	0.046
PFD*CSR	1.834**	0.030	–	–
SI	–	–	0.356**	0.038
SI*CSR	–	–	0.713**	0.029
BS	0.055***	0.000	0.379	0.496
FII	0.080	0.903	0.075	0.909
FCEO	0.094	0.322	0.075	0.420
FChair	0.243**	0.052	0.257**	0.037
Big4	0.200***	0.003	0.203***	0.002
SOE	0.212***	0.000	0.214***	0.000
BMAA	0.029***	0.000	0.030***	0.000
BMMF	0.059	0.275	0.062	0.252
CEOP	0.164***	0.008	0.171***	0.005
Lev	–3.825***	0.000	–3.830***	0.000
Industry		YES		YES
Year		YES		YES
No of Obs		6029		6029
R ²		38.42		36.05

Note: ***, **, and * represent $p < 0.01$, $p < 0.05$, $p < 0.1$. For a detailed explanation of variables see Table 1.

Source: Calculations by the authors.

interaction variables $PFD*CSR$, $SI*CSR$ are positive and also highly significant at 5 percent level ($\beta = 1.834$, $p < .05$, $\beta = 0.713$, $p < .05$). These findings confirm our main results in Table 4.

4.4.2. An alternative measure for the firm performance

Table 6 represents the alternative measure for the firm performance. We used the return on equity as an alternative measure of the firm performance. The coefficients of board gender diversity proxy (BI) are positive and highly significant at 5 percent level ($\beta = .130$, $p < .05$), indicating that female directors can significantly improve a company's financial performance. In Table 4, model 2, we add the interaction variable ($BI*CSR$) to investigate the moderating role of CSR on the relationship between board gender diversity and firm financial performance. The coefficient of $BI*CSR$ is positive and significant at 5 percent level ($\beta = 1.287$, $p < .05$), which means that CSR moderates the relationship between board gender diversity and firm financial performance. These findings also confirm our main results in Table 4.

4.4.3. Endogeneity problem

To deal with the possibility of endogeneity, by following previous studies (Sial, Chunmei, et al., 2018), we use the two-stage least square (TSLS). Table 7, model 1, represents the result of the instrumented board gender diversity proxy (*Blau index*) on the firm financial performance. The coefficient of Blau index remains positive and significant at 5 percent level ($\beta = 0.357$, $p < .05$). Furthermore, the coefficient of interaction variables in the model 2 ($BI*CSR$) is highly significant at 5 percent level ($\beta = 2.016$, $p < .05$). Results of the two-stage least square model remain significant and validate our previous regression results.

Table 6. Robustness tests: alternative measures for firm performance.

Variables	Model 1 (ROE)		Model 2 (ROE)	
	Coef.	p-Value	Coef	p-Value
BI	0.130**	0.052	1.267	0.154
CSR	–	–	0.657**	0.019
BI*CSR	–	–	1.287**	0.015
BS	0.045***	0.001	0.045***	0.002
FII	0.014	0.478	0.019	0.978
FCEO	0.028	0.432	0.023	0.389
FChair	0.321**	0.039	0.432**	0.048
Big4	0.127***	0.000	0.145***	0.005
SOE	0.198***	0.004	0.199***	0.003
BMAA	0.019***	0.000	0.028***	0.001
BMMF	0.037	0.232	0.040	0.278
CEOP	0.261***	0.007	0.378***	0.009
Lev	–2.646***	0.000	–2.578***	0.000
Industry		YES		YES
Year		YES		YES
No of Obs		6029		6029
R ²		34.51		35.26

Note: ***, **, and * represent $p < 0.01$, $p < 0.05$, $p < 0.1$. For detail explanation of variables see Table 1.

Source: Calculations by the authors.

Table 7. Robustness tests: endogeneity problem.

Variables	Model 1 (TQ)		Model 2 (TQ)	
	Coef.	p-Value	Coef	p-Value
BI	0.357	0.013	2.791	0.005
CSR			0.363	0.173
BI*CSR			2.016	0.012
BS	0.011	0.064	0.089	0.665
FII	0.172	0.077	0.015	0.781
FCEO	0.129	0.256	0.142	0.213
FChair	0.017	0.913	0.206	0.894
Big4	0.221	0.197	0.243	0.194
SOE	0.160	0.183	0.181	0.134
BMAA	0.528	0.000	0.062	0.000
BMMF	0.037	0.533	0.031	0.563
CEOP	0.053	0.362	0.699	0.318
Lev	–1.252	0.000	–1.284	0.000
Constant	6.479	0.000	6.903	0.000
R ²		26.70		27.47

Note: ***, **, and * represent $p < 0.01$, $p < 0.05$, $p < 0.1$. For detailed explanation of variables see Table 1.

Source: Calculations by the authors.

5. Conclusion and future research

In our study, we empirically investigated the effect of board gender diversity on firm financial performance, among the Chinese listed companies and checked the moderating role of CSR on the relationship between board gender diversity and firm financial performance, for the period 2010–2019.

We found that female directors on boards have a significant positive effect on firms' financial performance. We also found that CSR positively moderates the relationship between board gender diversity and firm financial performance. Our results show that CSR leads to an increase in the firm financial performance.

The current study enriches the capacity of understanding the development of CSR disclosure and also increases the understanding that female directors affect the

decision of a firm to disclose more CSR activities, which will increase the firm financial performance.

Our study has important implications. It allows to enrich the existing literature on CSR and highlights the importance of board gender diversity, showing its impact on improving firm financial performance.

Our research also has implications for policymakers. Firstly, our study represents a great help to investors and regulators in the Chinese business context because they can open new prospects on the understanding of the role of gender diversity on boards. Secondly, they can contribute to a better understanding of CSR disclosure.

Findings of the current research have implications for regulators, policy-making institutions, government officials and other official bodies, corporate executives, and other professionals in China, as well as for other countries' entities. The Chinese economy has become the center of attention for researchers due to its rapid economic growth and corporate evolution in the last few decades. But this happened with a high cost for the environment. Our study will help policymakers and regulators in the design of CSR related policies, in such a way that guidelines can be implemented in practice. Also corporate transparency in terms of financial and social reporting along with decision-making mechanisms of the board of directors (BOD) can be improved. The Chinese financial market has many global players but still needs to improve its CSR performance, as the general CSR performance of the Chinese companies seems to be dragged back by the state-owned enterprises. The state owned enterprises should improve their social, environmental, and economic performance. The state ownership of enterprises should be curtailed, to improve the social and corporate performance of these enterprises as well.

However, our study has several limitations. First, we use only 6029 firm-year observations because a larger data support is not available. So, future studies may use a larger sample size to study the possibility of getting new results on this issue. Second, future studies may classify female directors into executive and independent directors to get a new topic on this research line. Finally, much of attention have been given by researchers to the board gender diversity, but till today we do not know much about the boardroom international diversity, especially in the context of developing countries, and that is why future studies should also consider this aspect.

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