



Article

The Effect of Female Directors on ESG Practice: Evidence from China

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Abstract: This paper empirically examines the impact of female directors on corporate ESG disclosure scores based on upper echelons theory and women's ethics of care theory by conducting a multiple regression analysis on 8193 observations of Chinese listed companies from 2010 to 2020. Our results demonstrate the importance of female directors' participation in promoting corporate ESG practices. We conclude that the higher the proportion of female directors on the board, the higher the corporate ESG practice score. Further analysis also revealed that a favorable institutional environment and non-state enterprises positively moderate the relationship between female directors and corporate ESG practices. These results highlight the significant contribution of female directors to corporate ESG practices. Our paper sheds additional light on issues related to female directors and corporate ESG practices in Chinese listed companies, expands the theoretical knowledge of ethical decision-making and institutional environments in listed companies, enriches research in the area of female directors' decision-making, and has important implications for corporate governance related policy-making in China.

Keywords: upper echelons theory; corporate environmental; social; corporate governance responsibility (ESG); institutional environment



Citation: Peng, Hongyu, and Tirapot Chandarasupsang. 2023. The Effect of Female Directors on ESG Practice: Evidence from China. *International Journal of Financial Studies* 11: 66. <https://doi.org/10.3390/ijfs11020066>

Academic Editors: Elisabete Vieira, Mara Teresa da Silva Madaleno and Julio Lobao

Received: 16 February 2023

Revised: 17 April 2023

Accepted: 24 April 2023

Published: 27 April 2023



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1. Introduction

With the transition from the popular saying “Women hold up half the sky” to the more contemporary “Her era”, there has been a notable change in how social psychological perception reflects the gradual rise of the role of females in the Chinese workplace. The increasing influence of women in various industries has brought about significant changes to the business landscape and has garnered the attention of management scholars. As a crucial governance mechanisms a board of directors plays a vital role in overseeing and advising management, as well as guiding corporate strategy and ESG (environmental, social, and governance) initiatives (Menicucci and Paolucci 2022). Countries such as Norway, Spain, and Sweden have enacted legislation mandating quotas for female directors to promote gender diversity on corporate boards. This has led to improvements in board diversity on a global scale, with the average percentage of women on boards steadily increasing. As per a study published by Credit Suisse Research in 2021, the average percentage of women on boards, defined as the total number of female board members as a percentage of the total size of all company boards in the Gender3000 database has risen to nearly 24%, which is an increase of 8.9% since 2015 (Kersley et al. 2021).

In the context of corporate governance, the influence of female directors on corporate behavior and decision-making has become a prominent topic in the academic research. It has been argued that the participation of female directors in corporate decision-making can bring diverse viewpoints and improve the quality of corporate decision-making (Campbell and Mínguez-Vera 2008). This enhances the monitoring function of the board of directors and promotes the efficiency of corporate decision-making, while mitigating unwise

risk-taking. Additionally, female leadership is often associated with non-economic aspects of corporate performance, such as a firm's environmental reputation (Setó-Pamies 2015). Existing literature supports this perspective, as studies have shown that women tend to be more environmentally conscious and willing to participate in environmental entrepreneurship projects (Braun 2010). Moreover, research has found that firms with a higher proportion of female directors are more likely to be included in the Dow Jones Sustainability Index (Valls Martinez et al. 2019). Furthermore, a study by Liao et al. (2019) found that environmental innovation is positively correlated with the proportion of female directors. Similarly, research has shown that female directors tend to be more diligent in performing their oversight functions (Adams and Ferreira 2009). Gender diversity on boards has been found to significantly enhance the transparency of information and the quality of earnings disclosures, and to reduce investment and merger and acquisition risks (Levi et al. 2014). Previous research has demonstrated that female directors contributed to improved corporate governance, reduced agency costs, and mitigated management short-sightedness (Adams and Ferreira 2009). Though limited, studies have explored the impact of gender differences on boards of directors on corporate ESG practices, and this paper aims to contribute to expanding the literature in this area.

Over the past two decades, public companies have faced increasing pressure to adopt sustainable business strategies, driven by the concept of corporate social responsibility (CSR), which encompasses concerns for stakeholders, the external environment, and social responsibility (Dahlsrud 2008). However, as significant global challenges such as climate change and social conflicts have emerged, companies are now arguing that CSR needs to evolve into an integrated reflection of the three components of ESG: environmental, social, and corporate governance. As a result, ESG has become a valuable metric for capital markets and investors to assess and track sustainable business practices. Companies with higher ESG metrics are perceived to pose fewer risks, offer greater rewards, and exhibit resilience during corporate crises (Cardoni et al. 2020). ESG reports disclosed by companies contribute to increased brand loyalty and reputation, improved investor perceptions of corporate risk and performance, the reduced cost of capital, and enhanced social acceptance, ultimately leading to higher sales revenue (Camilleri 2015). Moreover, Cheng et al. (2014) demonstrated that disclosing ESG information helps reduce the personal constraints firms face in financing their operations, such as credit constraints. As a result, an increasing number of companies are choosing to disclose information in their ESG practices. Corporate ESG practices serve as a modern measure of accountability, and companies can enhance their strategic and financial advantage by setting and achieving non-financial goals, as well as by actively participating in and disclosing ESG-related information in all three aspects of ESG activities. It has been documented that positive ESG performance helps companies reduce the cost of equity capital (El Ghouli et al. 2011), reduces the cost of debt and hedge risk (Albuquerque et al. 2019), and fosters trust during crises (Lins et al. 2017). Moreover, research has shown that ESG significantly enhances corporate performance and long-term value (Friede et al. 2015).

Research in corporate governance has identified board gender diversity as a variable affecting corporate social responsibility (CSR) performance and its disclosure (Birindelli et al. 2019). In recent times, the ESG concept has gained significant attention from investors, governments, and other stakeholders as a solution to social problems. While agency theory supports ESG disclosure on the future and current performance of firms (El Ghouli et al. 2011), there has been limited research on the role of gender diversity in corporate ESG practices of Chinese listed firms. Existing studies have primarily focused on developed western countries when exploring the link between social responsibility and corporate governance reporting levels (Arayssi et al. 2016). Chinese corporate governance structures differ significantly from mature western governance systems, characterized by low levels of investor protection, weak capital markets, and high levels of insider shareholding. As developing countries have less mature governance systems and less complete structures (Al-Hadi et al. 2018), the findings on the influence of gender diversity on corporate ESG

practices may differ significantly. Therefore, this paper aims to introduce the characteristics and advantages of female directors based on upper echelons theory, analyze their influence and mechanism of action on corporate ESG practices, and examine the differences between state-owned enterprises and non-state-owned enterprises in this mechanism of action, taking into consideration the realistic background of Chinese enterprises with different attributes of ownership. Furthermore, the paper will examine the impact of three aspects of corporate ESG practices on financial performance and compare their relative importance in terms of influencing performance.

This paper makes several contributions to the research field. First, it addresses a gap in the literature by focusing on Chinese listed companies as the study target. While a growing number of studies have explored the potential benefits of female directors in developed countries (Ahmadi et al. 2018), there is a lack of research on the impact of gender diversity on corporate ESG in China. The impact of corporate governance mechanisms, such as board gender diversity, on ESG practices may vary between developing and developed countries. Second, while previous research examining female executives and CSR has mainly focused on demographic characteristics or social responsibility performance (Zhang 2013), this paper integrates board gender diversity with corporate ESG performance for an in-depth analysis. By exploring how female directors contribute to ESG, we provide insights into their role in a new context. Third, this paper contributes to the literature on corporate governance and board gender diversity. Board gender diversity is recognized as critical for effective boards, supporting the critical evaluation of alternative perspectives (Janis 1972), enhanced decision-making (Daily and Dalton 2003), and higher levels of board accountability (Terjesen et al. 2009). While existing research focuses on the impact of board gender diversity on firm performance, this paper extends it by examining the relationship between board gender diversity and ESG practices.

2. Literature Review and Hypothesis Development

2.1. Literature Review

The board of directors plays a central role in corporate governance. About 70% of listed companies in China have women on their boards. A report recently released by the US-based Ming Sheng Corporation shows that the percentage of women on boards in China increased yearly to 13.8% in 2021. The Special Report on Women Directors of Listed Companies in China 2021 shows that the percentage of companies with women on their boards grew from 46.35% to 76.20% over the ten-year period from 2012 to 2021. In line with this trend, on September 27 2021, the State Council issued “The China Women’s Development Program (2021–2030)”, which calls for a gradual increase in the proportion of women on corporate boards of directors, supervisory boards, and in management. This case reflects the growing interest in recognizing the vital role of female directors in corporate governance in China.

The relationship between women’s traits their impact on corporate sustainability decisions has been established in the research. For example, studies have found that women tend to exhibit traits such as helpfulness, kindness, compassion, and sensitivity to relationships and the welfare of others more than men (Eagly et al. 2003). These psychological traits are associated with socially-oriented behavior, including consideration for environmental, social, and governance (ESG) factors in decision-making (Zhang et al. 2013). Furthermore, women’s educational and professional backgrounds may contribute to their heightened sensitivity to corporate sustainability decisions compared to men. Lastly, women often adopt work styles characterized by participatory communication, democratic decision-making, and process orientation, which can facilitate the identification and fulfillment of stakeholder needs and expectations (Bear et al. 2010). There are significant differences between women and men regarding values, beliefs, backgrounds, perceptions, and work styles. These gender-specific experiences are observed not only in the general population, but also among company directors (Post et al. 2011). In particular, female directors are often found to exhibit greater empathy towards stakeholder issues and demonstrate a higher

level of awareness and commitment to sustainability practices. This is supported by a consensus in the literature regarding the positive impact of female directors on sustainability performance.

From an environmental perspective, many studies have demonstrated that increasing the representation of women on boards can positively influence a company's fulfillment of its environmental responsibilities. There are several reasons for this trend. Firstly, female directors tend to be more supportive of renewable energy, which can drive green innovation within companies (Atif et al. 2021). Secondly, female directors are more likely to discourage unethical environmental practices when involved in corporate decision-making and strategy formulation (Lu and Herremans 2019), thus promoting responsible environmental behavior within the company. Lastly, a higher representation of women on the board can lead to increased possibilities of green product innovation, which can have positive environmental impacts (He and Jiang 2019).

From the perspective of social responsibility, the upper echelons theory suggests that the perceptions and values of the executive team can influence a company's socially responsible behavior. Previous literature in this area has indicated that the inclusion of female board members can bring benefits due to their greater concern for ethical behavior (Ford and Richardson 1994). Gender diversity has been shown to positively impact social performance (Veltri et al. 2021), and can also promote CSR disclosure (Cabeza-García et al. 2018). Studies have shown that when the chairman of the board is a woman or the proportion of women on the board increases, there is a significant improvement in corporate philanthropic giving, community involvement rates, and the external recognition of employee benefits (Gan et al. 2019). Therefore, the involvement of female directors can contribute to enhancing a company's reputation and reducing harmful socially responsible practices (Boulouta 2013). However, it is worth noting that there are differing views in academia, with some studies suggesting a negative relationship between women on boards and ESG disclosure. Cucari et al. (2018) proposed that the presence of female directors is driven more by regulatory pressure.

In terms of corporate governance, early scholars of the subject suggested that the primary function of female directors is the supervisory control function (Hillman et al. 2008), that they are more likely to serve in departments that perform supervisory control functions, are effective in improving the quality of corporate financial reporting, the monitoring of corporate CEOs, and have higher board attendance rates than male directors. There is extensive literature on the positive role of female directors in influencing the financial performance of firms. For example, studies have shown that the proportion of female directors in a company is positively correlated with the return on assets (ROA) of a listed company (Carter et al. 2010). However, literature also suggests that female directors may be negatively associated with financial performance or may have no significant relationship with it (Rose 2007). Furthermore, compared to male directors, female directors tend to possess traits such as value judgment, risk orientation, decision-making style, and leadership style that facilitate their participation in strategic decision-making, leading to improved decision-making quality (Trinidad and Normore 2005), and thus positively influencing the sustainable development of the firm. In addition, the presence of female directors expands the skill base of the board, facilitating the generation of a more diverse mix of knowledge and experience. Female directors can bring a fresh and different perspective on the consumer market, enabling the company to better meet consumer needs. For example, female directors may possess expertise and knowledge with regard to female market segments that can provide unique and valuable insights into strategic decision-making (Daily et al. 1999). However, there is a contrasting view in the literature, suggesting that the involvement of female directors may have a significantly negative impact on the number and deal value of corporate mergers and acquisitions (Chen et al. 2016).

The literature reviewed above highlights the positive contribution of female directors to the sustainable development of companies through their participation in corporate decision-making. However, it is crucial to adequately consider the unique characteristics

of Chinese listed companies in international studies when examining the relationship between female directors and corporate ESG practices. China, as a country with distinct political, cultural, and institutional factors, has seen a significant rise in the presence of women in the business world, making research on this topic particularly relevant and significant. Exploring the differences and nuances of the impact of female directors on corporate ESG practices in various regions, industries, and corporate contexts in China holds both theoretical significance and practical value. Therefore, this paper will analyze the relationship between female directors and corporate ESG practices within the context of Chinese research.

2.2. Hypothesis Development

The board of directors in the strategic decision-making process of listed companies is increasingly recognized as significant by scholars at both domestic and international levels. There is growing attention to the influence of the board of directors on a company's strategic decision-making. To further explore the impact of female director involvement on corporate ESG practices and clarify the mechanisms through which female directors influence corporate ESG practices, this paper will analyze the characteristics of female directors that may shape corporate ESG practices from the perspective of feminine care ethics and upper echelons theory.

Female directors, in comparison with male directors, possess the inherent characteristics of virtue, decision-making style, and they diversify boards of directors, all of which can contribute to improving the quality of corporate decisions. Carol Gilligan's research suggests that gender differences result in variations in moral concepts, moral and logical reasoning, and ethical values. The ensuing feminine ethics of care emphasizes the moral and behavioral characteristics that distinguish women from men, noting that these moral factors directly influence management behavior and leadership styles.

Research has shown that female directors tend to exhibit virtues that are commonly associated with women, such as kindness, helpfulness, concern for others, attention to relationships, and sensitivity to the needs of others (Cosma et al. 2021). Women are often seen as more benevolent, less power-oriented, and more focused on sustaining relationships in their decision-making compared to men (Adams and Funk 2012). Based on these gender characteristics, women are more inclined to support and nurture relationships, and prioritize the needs of others over their own (Rosener 1997). These gender-specific experiences are observed not only in general population samples, but also in corporate leadership (Post et al. 2011). Female directors exhibit a heightened concern for ethical practices and a stronger commitment to social responsibility compared to male directors. Women leaders who have a strong sense of social responsibility are more likely to empathize with the negative impacts of corporate environmental pollution on surrounding communities and families when making decisions about their company's environmental behavior, and thus are more likely to respond positively to address these issues. These benefits associated with female directors may contribute to the improved quality and effectiveness of board deliberations, thereby facilitating strategic changes in the company's environmental practices. In addition, charitable giving is seen as a meaningful way for female directors to care for others, contribute to society, and satisfy social responsibility requirements. Companies with women on their boards tend to be more responsive to philanthropy, reputation, and ethical behavior. The presence of women on a board also enhances the effectiveness of outside directors with regard to their interest in corporate information and leadership. Women are often perceived to be less financially and self-interested compared to men, which can facilitate more effective global relationships (Ibrahim and Angelidis 1991). Moreover, women are often more sensitive to and supportive of corporate social responsibility (CSR) practices in terms of corporate performance. Female directors tend to be actively involved in strategic issues that impact the company and its stakeholders, as they prioritize relationship cultivation, define themselves through relationships, and build networks of relationships that garner public support (Nielsen and Huse 2010). For example, women constitute a

significant consumer group, and female directors are more likely to understand consumer behavior and bring new knowledge about consumer needs to corporate decision-making. They may be more attuned to environmentally conscious consumers and to identifying the demand for environmentally friendly products, thereby building positive relationships with these consumers.

The initial proposition of upper echelons theory states that that characteristics of the management context can partially predict the strategic choices and performance levels of organizations. This means that personal factors such as age, gender, work experience, education, and the religion of the members of the board of directors can significantly impact corporate decisions (Daily and Dalton 2003). Differences in the cognitive frameworks among directors, including their experience, knowledge, and values, as well as access to and evaluation of information processes, can lead to varying effects on their participation in the strategic decision-making process of the board. Specifically, female directors may perceive their leadership role in the company differently from male directors (Glass et al. 2016). Men generally tend to focus on the primary needs of shareholders, while women are often more attentive to the needs of a wider range of stakeholders (Adams et al. 2011). Women also tend to show more interest in non-work areas, such as philanthropy and community service. Therefore, hiring female directors can contribute to establishing a positive relationship with the external environment and enhancing the satisfaction of stakeholders, including consumers and potential investors, which in turn can lead to improved CSR practices and business performance. Additionally, women's mental attitudes are more likely to reduce information asymmetries with other stakeholders and the market, promoting transparency and trust (Zhang et al. 2013). The professional background of female directors, often as business support representatives or community influencers, gives them a broader knowledge of different areas. This enables them to propose alternative solutions and demonstrate a positive attitude toward addressing corporate social responsibility issues and environmental concerns (Shaukat et al. 2016). Moreover, the addition of female directors to the board promotes board balance and independence, which enhances the monitoring and control functions of the board. Female directors contribute to better board accountability and strengthened decision-making power, as they bring a broader perspective and careful consideration of issues (Daily and Dalton 2003). This increased independence can also help reduce corporate agency costs and improve corporate governance efficiency, ultimately leading to increased corporate value.

Numerous studies have confirmed the positive impact of female directors on various aspects of corporate social responsibility (CSR). Research shows that firms with more female participation on their boards tend to have higher CSR scores, including in areas such as shareholder responsibility, employee responsibility, environmental responsibility, customer responsibility, charitable giving, and CSR disclosure (Brammer and Pavelin 2008). Female directors are known to be actively involved in environmental, social, and governance (ESG) activities, and disclose them in their annual reports. They support ESG initiatives and effectively address ESG-related issues, thereby enhancing corporate governance and potentially improving ESG disclosure. Drawing on the work of Jin et al. (2021), the primary objective of our study is to empirically examine the positive influence of female directors on ESG practice performance, thus forming our first hypothesis.

Hypothesis (H1). *Female directors are positively associated with corporate ESG practices.*

3. Methodology

3.1. Data and Samples

We obtained ESG indicator data from the China Research Data Service Platform (CNRDS) and other financial indicator data from the Cathay Capital Database (CSMAR). Our initial sample included all companies listed on the Shanghai and Shenzhen stock exchanges between 2010 and 2020, excluding firms in the financial and insurance industries. We further excluded firm years with negative assets or sales and samples with missing

ESG data. After these exclusions, our final sample consisted of 8193 valid sample data. To mitigate the impact of outliers on the sample results, we performed a top and bottom 1% tail reduction on all continuous variables.

3.2. Measures

3.2.1. Dependent Variables

Based on stakeholder theory (Clarkson et al. 1994), this paper utilizes the China Research Service Platform (CNRDS) ESG database as the primary data source for ESG practices, and employs a content analysis method score for corporate ESG practice items. The scoring system assigns a value of 1 if a company takes action based on a relevant indicator, and a value of 0 otherwise. Table 1 provides a detailed overview of the specific indicators used in this study. The selection of indicators is based on the main concepts of ESG practices. In the environmental aspect, the focus is on examining the extent to which companies practice the concept of sustainable development. This includes eight positive indicators, such as environmentally beneficial products, and two negative indicators, such as environmental penalties and pollutant emissions. For social responsibility, the main focus is on corporate social responsibility and philanthropic contributions. This includes nine positive indicators, such as support for education, and two negative indicators, such as financing and employee safety disputes. In terms of corporate governance, the primary emphasis is on the diversity of corporate governance structures and the level of corporate disclosure. This includes 11 positive indicators, such as the comprehensiveness of CSR reports, and two negative indicators, such as accounting irregularities and product disputes.

Table 1. ESG practice evaluation dimension table.

Level 1 Indicators	Indicator Content
Environment (E)	Environmentally beneficial products, waste reduction measures, circular economy, energy conservation, green office, environmental certification, environmental recognition, environmental penalties, pollutant emissions, other environmental advantages
Social Responsibility (S)	Support for education, support for the charity, volunteer activities, international assistance, employment generation, promotion of the local economy, employee welfare, safety training, financing disputes, employee safety disputes, and other social responsibility advantages
Corporate Governance (G)	CSR reporting comprehensiveness, CSR leadership structure, reliability assurance, party participation in governance, female executives, innovative HR programs, after-sales service, anti-corruption measures, strategy sharing, integrity management philosophy, accounting irregularities, product disputes, other corporate governance strengths

In this study, we adopt the approach used by [Borghesi et al. \(2014\)](#) to calculate the practice level for each aspect of ESG. This involves adding the positive indicators related to environmental, social, and governance practices, subtracting the negative indicators, and finally dividing this by the total number of items to obtain the environmental practice level (E_Score), social practice level (S_Score), and actual governance level (G_Score), respectively. The arithmetic mean of the practice level of the three aspects is then calculated to obtain the overall ESG practice level variable (ESG) of the listed companies analyzed in this study.

3.2.2. Independent Variables

To measure women’s participation on boards, we used the proportion of female directors, which is calculated as the number of female directors divided by the total number of directors, expressed as a percentage. In addition, we differentiated the type of female directors’ influence on corporate social responsibility by measuring the proportion of female key directors and the proportion of female non-key directors as separate independent variables in our analysis. Furthermore, to ensure the robustness of our findings, we also conducted robustness testing by using the number of female director participants as a replacement for the independent variables.

3.2.3. Control Variables

Referring to Romano et al. (2020) and Arayakarnkul et al. (2022), this paper controls for various factors that may influence a firm’s value. These factors include corporate financial indicators such as company size (Size), company growth (Growth), gearing ratio (Lev), profitability (Roa), and enterprise value (Tobin Q). Additionally, corporate governance indicators such as equity concentration (Top3), management shareholding (Ms), directors’ remuneration (Ln Salary), directors’ evaluation age (Age), and board size (Boardsize) are also included as control variables. The specific definitions of these variables can be found in Table 2.

Table 2. Variable descriptions.

Variable Category	Variable Name	Variable Symbols	Calculation and Definition of Variables
Dependent variables	ESG practice	ESG	According to the construction of ESG evaluation index system practice project measurement
Independent variables	Proportion of female directors	Female	Number of female directors/total number of board of directors
Control variables	Company size	Size	Natural logarithm of total assets
	Company growth	Growth	Growth rate of company sales revenue
	Asset-liability ratio	Lev	Total assets as a percentage of total liabilities
	Profitability	Roa	Return on total assets over the accounting period
	Concentration of shareholding	Top3	Shareholding of the top three shareholders as a percentage of total equity
	Enterprise value	TobinQ	Enterprise market capitalization to total assets
	Board size	Boardsize	Number of board members of listed companies
	Management shareholding	Ms	Management shareholding
Directors’ Remuneration	Ln Salary	Natural logarithm of total remuneration of all directors	
Average age of directors	Age	Average age of all directors	

3.3. Empirical Model

Drawing upon the work of Tsang et al. (2022), the benchmark regression model (1) in this study for examining the practice of ESG by female directors is constructed as follows:

$$ESG_{i,t} = \beta_0 + \beta_1 Female_{i,t} + \sum \beta_i CV_{i,t} + year_t + ind_i + \epsilon_{i,t} \tag{1}$$

In the model, *i* represents the firm, *t* represents the year, and *CV_{i,t}* represents the main control variables in this paper. *Year_t* and *ind_t* represents the year fixed effects and industry fixed effects, respectively, *ε_{i,t}* as random disturbance terms.

To mitigate concerns about potential endogeneity between female directors and corporate ESG practices arising from reverse causality, we have incorporated a lagged term for ESG practices into our model in this study.

4. Empirical Result

4.1. Descriptive Statistics

Table 3 presents descriptive statistics for the main variables. The mean value of the ESG practice level of listed companies is 0.325, with a minimum value is 0, a maximum

value of 0.796, and a standard deviation of 0.127. These results indicate that the overall ESG practice level of listed companies in China is low, with considerable variation among different companies. Furthermore, the average values of the sub-dimensions, including environmental responsibility, social responsibility, and corporate governance are relatively small, suggesting that there is ample room for improvement in the ESG practices of the listed companies. The table shows that the mean and median of the variable reflecting the proportion of female directors (Female) are 0.122 and 0.111, respectively, with a standard deviation of 0.120. The minimum and maximum values were 0 and 0.571, respectively, indicating that the proportion of female directors in Chinese listed companies is relatively low, falling below the 25% and 40% requirements of Swedish and Norwegian corporate governance principles for the proportion of women on a board. This suggests that there is a deficiency in the representation of women on the boards of Chinese listed companies.

Table 3. Descriptive statistics of the variables.

Variable Symbol	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum
Variable	N	Mean	SD	Min	p50	Max
ESG SCORE	8193	0.325	0.127	0	0.313	0.796
E SCORE	8193	0.294	0.170	−0.100	0.300	0.800
S SCORE	8193	0.331	0.177	−0.091	0.364	0.818
G SCORE	8193	0.350	0.143	−0.077	0.308	0.846
Female	8193	0.122	0.120	0	0.111	0.571
Size	8193	23.076	1.414	18.329	22.965	26.372
Lev	8193	0.485	0.198	0.026	0.496	1.513
Roa	8193	0.048	0.061	−0.451	0.0402	0.318
Growth	8193	0.364	1.069	−0.983	0.123	18.100
TobinQ	8193	2.116	1.612	0.773	1.592	19.700
Ms	8193	6.180	13.884	0	0.0184	73.500
Boardsize	8193	9.132	1.873	5	9	15.000
Top3	8193	51.428	16.656	15.073	51.548	87.571
Ln Salary	8193	14.193	2.207	0	14.448	16.829
Age	8193	51.963	3.616	40.833	51.909	60.727

This study employs correlation analysis to examine the relationship between female directors and corporate ESG practice. The results, presented in Table 4, reveal a significant positive correlation between the dependent variable ESG and the independent variable Female at the 1% level, with a correlation coefficient of 0.050, tentatively confirming hypothesis 1. Moreover, the level of ESG practice is found to be significantly and positively correlated with a board size (Size) at the 1% level, with a correlation coefficient of 0.405. In contrast, the proportion of female directors (Female) is significantly and negatively correlated with a board size (Size) at the 1% level, with a correlation coefficient of −0.124.

Table 4. Correlation coefficients of the main variables.

	ESG SCORE	Female	Size	Lev	Roa	Growth	TobinQ
ESG SCORE	1						
Female	0.050 ***	1					
Size	0.405 ***	−0.124 ***	1				
Lev	0.094 ***	−0.118 ***	0.518 ***	1			
Roa	0.054 ***	0.047 ***	−0.076 ***	−0.398 ***	1		
Growth	−0.057 ***	0.033 ***	0.032 ***	0.106 ***	0.00100	1	
TobinQ	−0.136 ***	0.063 ***	−0.410 ***	−0.392 ***	0.377 ***	0.0120	1
Ms	−0.025 **	0.114 ***	−0.295 ***	−0.247 ***	0.164 ***	−0.00800	0.249 ***
Boardsize	0.073 ***	−0.112 ***	0.220 ***	0.106 ***	−0.00700	−0.040 ***	−0.141 ***

Table 4. Cont.

	ESG SCORE	Female	Size	Lev	Roa	Growth	TobinQ
Top3	0.147 ***	−0.125 ***	0.292 ***	0.066 ***	0.098 ***	−0.0120	−0.067 ***
Ln Salary	0.131 ***	0.083 ***	0.044 ***	−0.023 **	0.107 ***	−0.024 **	0.043 ***
Age	0.252 ***	−0.125 ***	0.381 ***	0.102 ***	−0.045 ***	−0.019 *	−0.156 ***
Ms	1	Boardside	Top3	Ln Salary	Age		
Ms	1						
Boardsize	−0.186 ***	1					
Top3	−0.052 ***	0.075 ***	1				
Ln Salary	0.074 ***	0.040 ***	−0.092 ***	1			
Age	−0.181 ***	0.059 ***	0.188 ***	−0.053 ***	1		

Notes: *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

4.2. Multiple Regression Analysis

In this study, a fixed effects model was employed for regression analysis, and the results are presented in Table 5. The findings reveal a significant positive relationship between female directors and current corporate ESG practices at the 1% level, with a regression coefficient of 0.034. This confirms hypothesis one of this study, suggesting that a higher proportion of women on the board of directors is associated with better corporate ESG performance, and that female directors make a significant contribution to the sustainable development of the company. Additionally, female directors exhibit a significant positive association at the 1% level, in both the environmental score and corporate governance score, with regression coefficients of 0.043 and 0.058, respectively, indicating that female directors play a role in enhancing companies’ environmental and corporate governance performance. However, a negative relationship is observed between female directors and the social responsibility score, with a regression coefficient of − 0.001. Moreover, the findings related to control variables in this study are largely consistent with the existing literature.

Table 5. Regression results of female directors and corporate ESG practices.

	(1)	(2)	(3)	(4)
	ESG_SCORE	E_SCORE	S_SCORE	G_SCORE
Female	0.034 ***	0.043 ***	−0.001	0.058 ***
	(3.28)	(2.85)	(−0.04)	(4.76)
Size	0.036 ***	0.041 ***	0.040 ***	0.027 ***
	(26.85)	(20.95)	(21.70)	(16.94)
Lev	−0.032 ***	−0.004	−0.033 ***	−0.059 ***
	(−3.93)	(−0.34)	(−2.82)	(−5.69)
Roa	0.083 ***	0.045	0.217 ***	−0.012
	(3.62)	(1.39)	(6.44)	(−0.41)
Growth	−0.004 ***	−0.006 ***	−0.006 ***	0.001
	(−2.89)	(−2.93)	(−3.74)	(0.40)
TobinQ	−0.002 **	−0.002	−0.003 ***	−0.001
	(−2.41)	(−1.53)	(−2.77)	(−0.94)
Ms	0.000 ***	0.000 **	0.000 ***	0.001 ***
	(5.20)	(2.37)	(3.25)	(5.71)
Boardsize	0.004 ***	0.003 ***	0.004 ***	0.003 ***
	(5.17)	(3.07)	(4.34)	(4.09)
Top3	0.000 ***	0.001 ***	0.000 ***	0.001 ***
	(6.33)	(5.01)	(2.85)	(5.99)

Table 5. Cont.

	(1)	(2)	(3)	(4)
	ESG_SCORE	E_SCORE	S_SCORE	G_SCORE
Female	0.034 ***	0.043 ***	−0.001	0.058 ***
Ln_Salary	0.002 *** (3.67)	0.002 ** (1.98)	0.003 *** (3.54)	0.002 *** (3.15)
Age	0.001 *** (2.97)	0.002 *** (2.90)	0.001 * (1.66)	0.001 * (1.86)
_cons	−0.653 *** (−18.01)	−0.787 *** (−14.64)	−0.777 *** (−14.66)	−0.396 *** (−8.86)
Year	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes
N	8193	8193	8193	8193
adj. R ²	0.378	0.230	0.358	0.253

Notes: *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

4.3. Robustness Test

4.3.1. Instrumental Variable Regression

Given that companies with higher levels of corporate ESG practices may place more emphasis on board gender diversity, it is plausible that the reverse could impact the findings of this study. To mitigate potential endogeneity concerns, a two-stage least squares estimation was conducted, utilizing the proportion of female directors of other firms within the same industry (Female_Ind), and the average proportion of female directors in other firms within the same region (Female_area) as instrumental variables.

Column (1) in Table 6 presents the outcomes of the first stage regression for the instrumental variables, demonstrating that both the average proportion of female directors in the firm's industry and the average proportion of female directors in the firm's location are significantly positive at the 1% level, with regression coefficients of 0.938 and 0.748, respectively. This confirms that the selected instrumental variables are correlated with the proportion of female directors in the company. Furthermore, the results of the instrumental variable two-stage least squares (2SLS) test align with the findings of the main analysis, affirming the robustness of the conclusions drawn in this study.

Table 6. Instrumental variable regression.

	Stage 1		Stage 2		
	(1) Female	(2) ESG_SCORE	(3) E_SCORE	(4) S_SCORE	(5) G_SCORE
Female		0.077 ** (2.44)	0.080 * (1.71)	0.033 (0.72)	0.117 *** (2.89)
Size	−0.001 (−0.89)	0.036 *** (26.94)	0.041 *** (21.03)	0.040 *** (21.82)	0.027 *** (17.07)
Lev	−0.033 *** (−3.62)	−0.031 *** (−3.74)	−0.003 (−0.24)	−0.031 *** (−2.73)	−0.058 *** (−5.47)
Roa	0.021 (0.79)	0.082 *** (3.56)	0.043 (1.35)	0.216 *** (6.43)	−0.014 (−0.49)
Growth	0.001 (1.11)	−0.004 *** (−2.93)	−0.006 *** (−2.96)	−0.006 *** (−3.77)	0.001 (0.35)
TobinQ	−0.002 (−1.43)	−0.002 ** (−2.30)	−0.002 (−1.47)	−0.003 *** (−2.72)	−0.001 (−0.83)
Ms	0.000 ** (2.59)	0.000 *** (5.01)	0.000 ** (2.27)	0.000 *** (3.14)	0.001 *** (5.53)
Boardsize	−0.002 *** (−2.91)	0.004 *** (5.32)	0.003 *** (3.16)	0.004 *** (4.43)	0.004 *** (4.25)

Table 6. Cont.

	Stage 1		Stage 2		
	(1) Female	(2) ESG_SCORE	(3) E_SCORE	(4) S_SCORE	(5) G_SCORE
Top3	−0.000 *** (−5.25)	0.001 *** (6.53)	0.001 *** (5.13)	0.000 *** (2.95)	0.001 *** (6.18)
Ln_Salary	0.001 (1.34)	0.002 *** (3.60)	0.002 * (1.94)	0.003 *** (3.51)	0.002 *** (3.06)
Age	−0.002 *** (−7.02)	0.001 *** (3.27)	0.002 *** (3.04)	0.001 * (1.82)	0.001 ** (2.21)
Female_ind	0.938 *** (24.97)				
Female_area	0.748 *** (18.39)				
_cons	0.138 *** (3.71)	−0.673 *** (−17.25)	−0.803 *** (−13.92)	−0.792 *** (−14.05)	−0.423 *** (−8.74)
Year	Yes	Yes	Yes	Yes	Yes
ind	Yes	Yes	Yes	Yes	Yes
N	8193	8193	8193	8193	8193
adj. R ²	-	0.377	0.230	0.358	0.251

Notes: *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

4.3.2. Critical Mass Theory for Female Directors

The above findings focus on the marginal effects of female director variables on corporate ESG scores and their components. While the relationship between female directors and environmental, social responsibility, and corporate governance practices is positive and statistically significant, this measure does not fully capture the impact of adding a new woman to the board. The influence of women may vary depending on the size of the group they form in the boardroom. The absolute number of women directors can significantly impact the level of ESG practices in a company. For instance, three women on a 15-member board may have more influence compared to one woman on a five-member board. In cases where there are only one or two women, they may be perceived as token individuals and may have limited opportunities to exert influence on the board. However when the number of women reaches a critical mass, typically defined as three or more, their voices are more likely to be heard and their ideas are more likely to be considered, leading to increased influence on the board. To capture the influence of women based on the size of the group they comprise, we employed the concept of critical mass (Key_female) as a measure of gender diversity in the regression model, aiming to validate the critical mass theory. Specifically, the value of Key_female is set to 1 when the number of female directors exceeds or equals three, and it is zero otherwise. As shown in Table 6, the results demonstrate the relationship between reaching the critical mass of female directors (Key_female) and corporate ESG score (ESG_SCORE), as well as its three components.

Column (1) in Table 7 reveals that the presence of a critical mass of female directors is significantly associated with ESG scores at a high level of significance (1%), with a regression coefficient of 0.012. In columns (2), (3), and (4) of Table 7, the results further substantiate the positive contribution of women to the practice scores of each ESG component when they reach the critical mass threshold. Among the three components, the critical mass of women on the board demonstrates a positive and statistically significant effect on both the environmental performance score and the corporate governance score, both of which are significantly related at the 1% level, but exhibits a negative and insignificant relationship with the social responsibility score. Overall, the findings in Table 7 suggest that boards with an adequate number of female directors generally have a stronger positive impact on corporate ESG practices, particularly in terms of environmental performance and corporate governance performance, while they have a relatively minor negative impact on social responsibility performance.

Table 7. Critical mass of women in the boardroom and the level of corporate ESG practices.

	(1)	(2)	(3)	(4)
Key_Female	ESG_SCORE 0.012 ***	E_SCORE 0.018 ***	S_SCORE −0.000	G_SCORE 0.018 ***
	(2.88)	(2.93)	(−0.09)	(3.90)
Size	0.036 *** (26.84)	0.041 *** (20.94)	0.040 *** (21.70)	0.027 *** (16.91)
Lev	−0.033 *** (−4.00)	−0.005 (−0.38)	−0.033 *** (−2.83)	−0.060 *** (−5.78)
Roa	0.084 *** (3.62)	0.045 (1.38)	0.217 *** (6.44)	−0.012 (−0.40)
Growth	−0.004 *** (−2.88)	−0.006 *** (−2.92)	−0.006 *** (−3.74)	0.001 (0.41)
TobinQ	−0.002 ** (−2.41)	−0.002 (−1.52)	−0.003 *** (−2.77)	−0.001 (−0.94)
Ms	0.000 *** (5.23)	0.000 ** (2.38)	0.000 *** (3.25)	0.001 *** (5.76)
Boardsize	0.003 *** (4.71)	0.003 *** (2.61)	0.004 *** (4.32)	0.003 *** (3.50)
Top3	0.000 *** (6.29)	0.001 *** (5.00)	0.000 *** (2.85)	0.001 *** (5.92)
Ln_Salary	0.002 *** (3.71)	0.002 ** (2.01)	0.003 *** (3.55)	0.002 *** (3.20)
Age	0.001 *** (2.87)	0.002 *** (2.84)	0.001 * (1.66)	0.001 * (1.70)
_cons	−0.645 *** (−17.81)	−0.777 *** (−14.50)	−0.777 *** (−14.74)	−0.380 *** (−8.54)
Year	Yes	Yes	Yes	Yes
ind	Yes	Yes	Yes	Yes
N	8193	8193	8193	8193
adj. R ²	0.378	0.230	0.358	0.252

Notes: *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

4.4. Further Analysis

4.4.1. Female Directors, Institutional Environment, and Corporate ESG

The institutional environment encompasses various factors such as the financing environment, marketability, and the rule of law. In the Chinese context, due to the differences in resource endowment, economic development levels, and national policies among regions, there are significant variations in the institutional environment in which companies practice ESG. Previous research on the institutional environment has shown that CSR performance differs across countries or regions. For example, [Huang et al. \(2022\)](#) argued that if a firm is located in a region with a higher level of financial development, the positive impact of CSR performance on access to bank credit loans may be weakened. Therefore, this study incorporates the institutional environment as a moderating variable. From an institutional perspective, enterprises are bound by “social contracts”, and are expected to conduct economic activities within certain social norms and institutional constraints. [Meyer et al. \(2009\)](#) highlight that the institutional environment plays a crucial role in shaping the fulfillment of CSR. Research also shows that regions with a more robust institutional environment tend to have better market competition and effective government intervention control ([Xia and Fang 2005](#)).

Therefore, it is plausible to anticipate that the institutional environment, as an external force, can significantly influence corporate ESG practices. In regions characterized by slower marketization and higher levels of government intervention, companies may feel compelled to engage in ESG practices to establish political connections or appease the government. In contrast, in regions with more advanced market processes and less government intervention, companies are more likely to proactively practice ESG by adhering to the

intrinsic ethical values of the organization. Consequently, the influence of the government on corporate environmental responsibility, social responsibility, and corporate governance behavior is expected to diminish in regions with a sound institutional environment. Hence, the ethical guidelines followed by individual board members are expected to play a more significant role in ESG decision-making, highlighting the positive impact of feminist care in promoting ESG performance. Furthermore, as the marketization process and institutional environment improve, social gender discrimination is likely to diminish, leading to increased success for women in their careers (Gao et al. 2016). This favorable situation is conducive to enhancing the decision-making authority of women directors and amplifying the contribution of women's ethical values to corporate ESG practices. In conclusion, a more robust institutional environment in the region where a company is located is expected to amplify the positive effect of women directors in promoting corporate ESG practices.

The results in columns (1) and (2) of Table 8 indicate that in regions with a high level of marketization, female directors are significantly associated with corporate ESG scores (ESG_SCORE) at the 5% level, with a regression coefficient of 0.033. However, in regions with a less developed institutional environment, labeled as “developing markets”, the relationship between female directors and corporate ESG scores is non-significant but positive. This suggests that in regions where the institutional environment is less developed and the market is less developed, external systems and the internal disciplinary mechanisms of enterprises may be relatively imperfect, leading to the lower participation of enterprises in ESG practices.

Table 8. The moderating effect of institutional environment and nature of property rights on the relationship between female directors and corporate ESG practices.

	High Marketability	Low Marketability	(SOEs)	Non-SOEs
	ESG_SCORE	ESG_SCORE	ESG_SCORE	ESG_SCORE
Female	0.033 ** (2.47)	0.027 (1.61)	−0.008 (−0.54)	0.074 *** (5.18)
Size	0.034 *** (19.23)	0.038 *** (18.73)	0.037 *** (20.96)	0.031 *** (14.35)
Lev	−0.010 (−0.88)	−0.056 *** (−4.48)	−0.052 *** (−4.68)	−0.006 (−0.46)
Roa	0.095 *** (3.08)	0.066 * (1.85)	0.052 (1.52)	0.057 * (1.78)
Growth	−0.004 *** (−2.58)	−0.003 (−1.18)	−0.004 ** (−2.45)	−0.002 (−0.97)
TobinQ	−0.004 *** (−3.09)	0.001 (0.89)	−0.005 *** (−3.00)	0.000 (0.25)
Ms	0.000 *** (4.30)	0.000 ** (2.12)	0.000 (0.21)	0.000 *** (3.60)
Boardsize	0.005 *** (4.94)	0.003 *** (3.14)	0.002 * (1.91)	0.008 *** (6.64)
Top3	0.000 *** (2.85)	0.001 *** (5.09)	0.001 *** (5.73)	0.000 *** (3.52)
Ln_Salary	0.000 (0.58)	0.004 *** (4.09)	0.002 *** (3.53)	0.003 * (1.80)
Age	0.001 *** (3.09)	0.000 (0.48)	0.000 (0.23)	0.002 *** (2.90)
_cons	−0.628 *** (−13.36)	−0.696 *** (−14.08)	−0.544 *** (−11.15)	−0.731 *** (−12.95)
Year	Yes	Yes	Yes	Yes
ind	Yes	Yes	Yes	Yes
N	4853	3340	4860	3178
adj. R ²	0.378	0.415	0.392	0.414

Notes: *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

4.4.2. Female Directors, the Nature of the Ownership, and Corporate ESG

The government's control of state-owned enterprises (SOEs) is associated with increased economic and social responsibility, as corporate behavior often reflects the government's directives to a greater extent. SOEs are not solely focused on profit maximization, but also actively fulfill their social responsibilities. Moreover, SOE executives often align their understanding of corporate performance with the views of government officials, and they may proactively engage in social responsibility initiatives to cultivate a positive corporate image. This close relationship between SOEs and the government can influence ESG decision-making, which may limit the dynamic role of corporate boards. In contrast, non-SOEs operate differently, and research suggests that the link between firm performance and CSR disclosure is weaker among SOEs compared to non-SOEs (Li et al. 2013). Non-state corporate boards tend to be more motivated and active in their behavior, thus providing a conducive environment for female directors to express their ethical values and to make a more significant contribution to corporate ESG practices. Therefore, it is reasonable to expect that the role of female directors in promoting corporate ESG practices is more pronounced in non-SOEs than in SOEs.

The regression results in columns (3) and (4) in Table 8 provide insights from the subgroup test on the relationship between the nature of property rights of female directors and corporate ESG practices. The findings reveal that female directors in private firms exhibit a significant positive association with corporate ESG score (ESG_SCORE) at the 1% level, with a regression coefficient of 0.074. In contrast, state-owned enterprises (SOEs) show a negative but statistically insignificant association with corporate ESG score (ESG_SCORE). These results are in line with our expectations. It is plausible that SOEs may have additional political and social responsibilities which could potentially divert attention from ESG practices and result in a lower level of ESG performance compared to private enterprises.

4.4.3. Female Directors, ESG, and Business Performance

Chen and Xie (2022) conducted an empirical study and established a significant positive relationship between corporate disclosure of ESG information and financial performance. Moreover, El Ghouli et al. (2011) found that companies with socially responsible practices have higher valuations and lower financial risk. Similarly, Barnett and Salomon (2006) argued that social relationships are closely intertwined with financial performance, and social responsibility can be perceived as both a cost and a prudent investment by proponents of socially responsible investing. In a comprehensive analysis of the three components of ESG, Velte (2017) found that corporate ESG practices positively impact ROA, with corporate governance performance exerting the most substantial impact on financial performance compared to environmental and social performance.

The examination of the relationship between ESG and financial performance holds significant importance for corporate stakeholders. Through the lens of stakeholder management, enhancing corporate ESG performance can create sustainable competitive advantages, leading to improved corporate profitability. Companies perceive that being environmentally and socially responsible enhances their reputation and provides a competitive edge, potentially leading to better financial outcomes. They strive to cultivate positive relationships with stakeholders to enhance financial returns by developing intangible assets that can serve as a source of competitive advantage, differentiating them from their competitors (Branco and Rodrigues 2008). Therefore, it is reasonable to expect that the involvement of female directors in corporate ESG practices could contribute to the improved financial performance of companies.

As presented in Table 9, the regression coefficient of the ESG score and the interaction term ESG_SCORE* Female of female directors with corporate financial performance (TobinQ) is 2.101, demonstrating a significant correlation at the 5% level. This finding suggests that the involvement of female directors in driving corporate ESG practices has a significant positive impact on financial performance. Additionally, the interaction term E_SCORE* Female for environmental score and female directors is significantly correlated with the

corporate governance score, and G_SCORE* Female for female directors is significantly correlated with corporate financial performance (TobinQ) at the 1% and 5% levels, respectively. However, the interaction term S_SCORE* Female for social responsibility score and female directors shows a positive but not statistically significant relationship with corporate financial performance (TobinQ). These results indicate that, among the three components of ESG, the contribution of female directors in promoting corporate responsibility for environmental and corporate governance aspects to corporate financial performance is more pronounced than their contribution to social responsibility performance.

Table 9. Regression results of the effect of female directors and corporate ESG practices on financial performance.

	(1)	(2)	(3)	(4)
	TobinQ	TobinQ	TobinQ	TobinQ
ESG_SCORE	−0.365 ** (−2.06)			
Female	−0.884 *** (−2.92)	−0.688 *** (−3.09)	−0.420 * (−1.83)	−0.656 ** (−2.27)
ESG_SCORE*Female	2.101 ** (2.51)			
E_SCORE		−0.237 ** (−2.13)		
E_SCORE*Female		1.666 *** (2.75)		
S_SCORE			−0.216 * (−1.88)	
S_SCORE*Female			0.650 (1.15)	
G_SCORE				−0.073 (−0.52)
G_SCORE*Female				1.281 * (1.77)
_cons	19.488 *** (25.16)	19.448 *** (25.15)	19.389 *** (25.08)	19.465 *** (25.15)
controls	Yes	Yes	Yes	Yes
Year/id	Yes	Yes	Yes	Yes
N	8193	8193	8193	8193
adj. R ²	0.195	0.195	0.195	0.195

Notes: *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

5. Conclusions

With growing public concern about corporate environmental and social responsibilities, companies are increasingly recognizing the importance of publishing ESG assessment reports. In contrast to existing studies, this paper adopts a unique approach by examining the effect and mechanism of female directors’ influence on corporate ESG practices through the lens of women’s ethics of care and upper echelon theory. The empirical analysis is based on data from Chinese-listed companies spanning the period from 2008 to 2020. The findings reveal several key insights. First, female directors are significantly and positively associated with ESG performance, suggesting that the gender of directors has a significant impact on corporate ESG practices. Specifically, as the proportion of female directors increases, corporate ESG levels also show a significant increase. Second, the positive role of female directors in promoting corporate ESG practices is more pronounced in firms located in regions with less developed institutional environments compared to those in regions with superior institutional environments. This finding suggests that the market and organizational environment play a crucial role in shaping the influence of female directors in corporate governance. Third, the study finds that the impact of female directors on

promoting corporate ESG practices is more pronounced in non-state enterprises compared to state-owned enterprises. These findings collectively affirm the positive effect of female directors on enhancing corporate ESG performance, highlight the variation in their depending on the proportion of female directors, and further confirms the moderating effect of the institutional environment on the relationship between female directors and corporate ESG performance.

In terms of theoretical contributions, this study bridges the gap between women directors and corporate ESG decision-making, advancing the theoretical understanding of ethical decision-making, the institutional environment, and corporate ESG practices, and enriching the literature on female directors' decision-making. While previous research on female directors has primarily focused on companies in western countries such as the U.S., this study expands the scope by examining Chinese-listed companies, thereby shedding light on the unique context of emerging market countries like China. Given the difference in legal, economic, political, and socio-cultural environments faced by the listed companies across countries, boards of directors may exhibit significant variations in their functioning. In China, where external corporate governance mechanisms are relatively weak, the influence of female directors on corporate governance may differ from that in the U.S. (Elmagrhi et al. 2019). Therefore, this study provides insights into the mechanism of female directors' influence on corporate governance in the Chinese context, thereby enhancing the theoretical framework for analyzing the role of female directors in corporate governance.

In terms of practical contributions, the research presents a novel perspective on corporate governance and provides empirical evidence for the field of women's economics. The findings of this study have practical implications for various stakeholders, including companies, investors, and regulators, with regard to understanding the influence of female directors on corporate ESG practices and their impact on business and social development. The study offers several insights that can promote ESG alignment. First, enhancing the institutional environment is crucial for promoting corporate ESG behavior. Therefore, further institutional reforms and improvements in market mechanisms are necessary to enhance the ESG performance of Chinese companies. Previous research (Adams and Ferreira 2009) has demonstrated a substitution relationship between the corporate governance system, which includes the institutional environment as a key component, and the presence of female executives. Second, it is important to recognize that men's and women's values and ethical principles exhibit consistent characteristics across different contexts, and feminist caring ethics play an essential positive role in promoting corporate ESG practices. Gender diversity has been acknowledged as a critical factor for enhancing the effectiveness of top management teams (Isidro and Sobral 2015). Therefore, enterprises should consider the members' diverse characteristics of board members during the board formation process, provide adequate channels for the promotion of female directors, and create an inclusive space for integrating corporate human capital. In addition, regulators can use these findings as a reference to encourage companies at the policy level to actively promote gender diversity in their boards of directors, thereby fostering the fulfillment of corporate environmental, social, and governance responsibilities, and leveraging the unique and positive contributions of women directors to corporate ESG performance. This can also create a conducive environment for the career advancement of female directors, with potential implications for mitigating gender discrimination in society. Third, achieving harmony between the environment and the economy necessitates that companies embrace additional responsibility and actively disclose non-financial information. Despite the associated costs, the transparent disclosure of ESG information can attract more investors and enhance the long-term financial performance of firms (Chen and Xie 2022). Therefore, companies need to further enhance their ESG regulation and assessment systems. Companies, investors, and other participants in the capital market should prioritize ESG factors in their decision-making processes, taking into consideration the broader social and environmental impacts of corporate actions. Moreover, regulatory bodies should play a proactive role in

promoting ESG disclosure and transparency, and policymakers should consider implementing incentives to encourage companies to adopt sustainable practices and enhance ESG performance. Several scholars have recognized that SOEs tend to have more robust welfare policies for their employees compared to non-SOEs. However, it is widely acknowledged that SOEs often suffer from inefficiencies. To address this issue, SOEs can enhance their self-disclosure of ESG reports and subject themselves to public opinion monitoring. The active engagement of public media in monitoring the ESG behaviors of SOEs can facilitate transparency and public accountability, encouraging female directors to participate in ESG practices. Additionally, SOEs can learn from non-SOEs to promote long-term, stable social and economic development. By promoting responsible and sustainable corporate behavior, SOEs can contribute to the advancement of ESG goals and the overall enhancement of corporate governance practices in the context of SOEs.

Author Contributions: Conceptualization, H.P.; methodology, H.P. and T.C.; software, H.P.; validation, H.P.; formal analysis, H.P. and T.C.; investigation, H.P.; resources, H.P. and T.C.; data curation, H.P.; writing—original draft preparation, H.P.; writing—review and editing, H.P. and T.C.; visualization, H.P.; supervision, H.P. and T.C.; project administration, H.P. and T.C.; funding acquisition, H.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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