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Gender Diversity on Boards, Corporate Performance and Corporate Sustainability

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Abstract

In recent years, the trend of having female directors in corporations has swept across the globe, and Taiwan is no exception. This study examines female directors' impact on firm performance and ESG in Taiwan's listed service industry firms. The study finds that firm performance has a significant positive effect when the number of female directors exceeds three. Board gender diversity has a substantial and positive impact on firm ESG performance, and it is also found that board gender diversity has a significant and positive effect on the performance of corporate governance factors in firm ESG performance. Corporate performance is found to have a positive but insignificant effect on firms' ESG performance. At the same time, corporate performance is also found to significantly and positively impact firms' ESG performance on environmental factors.

Keywords: Board Gender Diversity, Firm Performance, ESG

1. INTRODUCTION

Female leadership has become a significant trend in international business. Women's governance shakes conventional wisdom from political leaders to corporate CEOs. Many studies have found that women have risen to prominence because of their ability to lead gently, their more significant concern for the environment and society, and the belief that femininity is an essential corporate value, leading to a rise in the demand for corporate thresholds for female directors. In Europe, following Norway's adoption of gender quotas on boards in 2003, several other European countries have made various attempts to introduce female directorships, with regulators mandating that the proportion of women on company boards be increased to between 20% and 50%. Most recently, the importance of women in governance was underscored when the European Conference agreed to have more than 40% of non-executive directors (those who do not hold senior executive positions in a company), or 33% of all board seats, filled by women by 2026/06/30.

Female leadership has long been an integral part of corporate America. There are numerous examples of outstanding female CEOs leading corporate change, such as Jane Fraser (CEO of Citi Bank), Karen Lynch (CEO of CVS Health), Carol Tome (CEO of UPS), and Mary Barra (former president of General Motors), to name a few. Although the U.S. leads the world in the percentage of women directors, the SEC has set the bar for future diversity director thresholds and a benchmark for women in management. Taiwan is actively promoting the advancement of female leadership. According to the "Action Plan for the Sustainable Development of Listed Companies" announced by the Financial Supervisory Commission (FSC), new public companies will be required to have at least one female director starting from 2023; listed companies will be required to have at least one female director beginning in 2024, and listed companies will be required to disclose the reasons for having less than one- third female directors starting in 2025. Currently, more and more women are found on Taiwan's listed boards. From 2017 to 2021, the number of listed companies with female directors on the boards of listed companies in Taiwan accounted for more than 70% of all listed companies. The average proportion of female directors among all company directors was more than 14% in each of those years, with a slight increasing trend (Table 1).

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Table 1 Numbers of female directors in listed companies

Year	Number of Companies	Companies with Female Board		F Board % Average	F Board % Max.	F Board % Min
		Number	%			
2017	858	606	70.63%	14.08%	71.43%	0.00%
2018	873	627	71.82%	14.53%	71.43%	0.00%
2019	882	631	71.54%	14.42%	66.67%	0.00%
2020	889	635	71.43%	14.38%	77.78%	0.00%
2021	899	648	72.16%	14.58%	100.00%	0.00%

Source: Organized by this study

The importance of female directors for corporations is indelible, but Rose (2007), Miller & del Carmen Triana (2009), and Carter, D'Souza, Simkins, & Simpson (2010) have found that gender diversity of directors is not related to firm performance. In addition, more and more national and international organizations worldwide are increasingly concerned with Environmental, Social, and Governance (ESG) factors. It is becoming increasingly evident that for all businesses to be sustainable, it is just as important to consider the social and environmental impacts of the company as it is to evaluate corporate governance policies, in addition to the traditional logic of pursuing profits. Many scholars research women directors from an ESG perspective and have found inconsistent results, such as positive (Khatri, 2023), negative (Cuccaro, Esposito de Falco, & Orlando, 2018), and even no association (Marinova, Planting, & Remedy, 2016). Women's influence on business may come from women's innate traits as well as from external circumstances. At a time when the Taiwanese government has introduced policies to enhance gender diversity on boards by requiring companies to nominate women to boards, this inconclusive state of knowledge is troubling, and it is essential to promptly clarify the impact of women's participation on boards and ESG.

This study examines the impact of board gender diversity on firm performance from the perspective of the female employment industry, female governance in Taiwan, and the relationship between board gender diversity on ESG performance and firm performance on ESG performance. Various parties have emphasized Taiwan's female executives in recent years. Harvard Business Review Global (Traditional Chinese version) surveyed with titled "Taiwan's Best Listed Female CEOs." from over 1700 listed companies across Taiwan and elect about 30 outstanding female corporate leaders. This type of competition enhances the quality of the competitive environment for women in Taiwan. How these female leaders exert gentle and determined power to face the challenges of the business environment is an interesting question.

According to the Human Resource Survey data conducted by the Bureau of the Comptroller's Office of the Executive Yuan from 2017 to 2021, more than 5 million women are employed annually. More than 70% of the employed women were in the service sector (Table 2). The top five occupations in terms of the number of employed women in the service sector were wholesale and retail trades, education, accommodation and food services, health insurance and social services, and financing and insurance (Table 3). To understand the critical impact of gender diversity on boards, we targeted the top three female employment sectors: trading and department stores, tourism and hospitality, and finance and insurance.

Table 2. Number of Female Employment by Sector

Unit: 1,000 people

Year	Total		Agriculture, Forestry, Fisheries and Livestock		Industry		Service Industry	
	Number	%	Number	%	Number	%	Number	%
2017	5,047	100	151	2.99	1,264	25.04	3,633	71.98
2018	5,089	100	146	2.87	1,276	25.07	3,667	72.06
2019	5,124	100	139	2.71	1,159	22.62	3,703	72.27
2020	5,126	100	142	2.77	1,278	24.93	3,706	72.30
2021	5,115	100	149	2.99	1,288	25.18	3,678	71.9

Source: "Survey on Human Resources", Accounting Office, Executive Yuan, R.O.C.

In addition to this introduction section, Section 2 reviews the theoretical literature in the research area, Section 3 presents the research methodology, and Section 4 describes the empirical findings and discussion. Finally, conclusions and recommendations are presented.

Table 3. Top five occupations of employed women in the service sector

Unit: 1,000 people

Year	Total		Wholesale and Retail Trade		Education		Accommodation and Catering		Healthcare and Social Services		Finance and Insurance	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
2017	3,633	100	980	26.97	478	13.16	454	12.50	351	9.66	268	7.38
2018	3,667	100	994	27.11	480	13.09	450	12.27	356	9.71	275	7.50
2019	3,703	100	996	26.90	498	3.45	448	12.10	364	9.83	279	7.53
2020	3,706	100	986	26.61	490	3.22	450	12.14	376	10.15	279	7.53
2021	3,678	100	978	26.59	473	12.86	452	12.29	388	10.55	272	7.40

Source: "Survey on Human Resources", Accounting Office, Executive Yuan, R.O.C.

2. LITERATURE REVIEW AND HYPOTHESIS

2.1 Gender Diversity on the Board and Corporate Performance

According to stewardship theory, internal board efforts to maximize shareholders' profit positively affect firm performance (Gaur, Bathula, & Singh, 2015). Noja, Thalassinos, Cristea, & Grecu (2021) emphasized the importance of gender diversity on the board of directors to improve firm performance. However, empirical results from emerging and developed economies must be more conclusive. Khan & Abdul Subhan (2019) utilized two measures of firm performance, ROE and ROA, to illustrate that female board members contribute to improved firm performance. Brahma, Nwafor, & Boateng (2021) used Tobin's Q and ROA as two measures of firm performance to show that the presence of three or more women on a firm's board of directors significantly and positively affects firm performance. To realize the positive impact of gender diversity on the board of directors, there must be at least three women on the board of directors of a company (Garanina & Muravyev, 2021). Many scholars have supported that gender diversity on the board of directors positively affects the company's performance(Sabri, Mohamed, & Sahari, 2020; Mohsni, Otchere, & Shahriar, 2021; Arvanitis, Varouchas, & Agiomirgianakis, 2022). Also, Awwad, Binsaddig, Kanan, & AI Shirawi (2023) found that female board directors positively affected firm performance and CSR disclosure during the same period.

Wellalage & Locke (2013) found that board gender diversity increases corporate conflict while decreasing firm financial performance. Boubaker, Dang, & Nguyen (2014) found that board gender diversity negatively affects firm performance. In the context of French-listed companies, Bennouri, Chtioui, Nagati, & Nekhili (2018) found that female directorships improve accounting performance (ROE and ROA) but reduce market-based performance (Tobin's Q). Naghavi, Pahlevan Sharif, & Iqbal Hussain (2021) illustrate that in countries with high power distance, masculinity, individualism, and low uncertainty avoidance cultures, having women on the board of directors negatively affects firm performance. The analysis of Kabir, Ikra, Saona, & Azad (2023) shows that gender-diverse boards are affected by the moderating effects of power distance and masculinity index. Kabir et al. (2023) analysis shows that the power gap moderates gender-diverse boards and the masculinity index significantly negatively affects firm performance.

In contrast to the above, some empirical studies have shown that there is an unrelated relationship between gender diversity on the board of directors and firm performance. For example, Khan & Abdul Subhan (2019) found that the number of female board members is unrelated to firm performance. Other studies have found that gender diversity on the board of directors does not lead to any change in firm performance (Fernández-Temprano & Tejerina-Gaite, 2020; Marquez- Cardenas, Gonzalez-Ruiz, & Duque-Grisales, 2022). Despite the existence of several studies that advocate that gender diversity on the board is beneficial to the firm, Singh, Singhania, & Agrawal (2023) found that the presence of gender diversity on the board in the IT sector in India does not affect Tobin's Q, and therefore does not affect the firm's performance. Taking into account the above, we have come up with the following assumptions:

H1: Gender diversity in the board of directors significantly positively affects firm performance.

2.2 Gender Diversity on Boards and ESG

Board gender diversity and ESG performance can be explained by resource dependence theory (Shakil, Tasnia, & Mostafiz, 2021). Corporate boards are an essential source of critical resources for companies (Hillman & Dalziel, 2003). Specifically, female directors are more sensitive to social, environmental, and ethical issues and are more concerned about stakeholders' interests than male directors (Fernandez, Burnett, & Gomez, 2019; Zahid, Rahman, Ali, Khan, Alharthi, Qureshi, & Jan, 2020). In addition, women's educational backgrounds are more relevant to non-financial issues and are more inclined to act ethically and avoid violating social and environmental policies than male directors (Valls Martinez, Cruz Rambaud, & Parra Oller, 2019; Wasiuzzaman & Wan Mohammad, 2020). The plurality ensured by such characteristics stimulates companies to adopt more socially responsible behaviors or sustainability practices, which in turn provide more accountability and transparency on ESG issues (Nadeem, Zaman, & Saleem, 2017; Valls Martinez et al., 2019; Wasiuzzaman & Wan Mohammad, 2020).

Several studies have found that reaching a balanced number of male and female board directors positively affects ESG performance (Birindelli, Dell'Atti, Iannuzzi, & Savioli, 2018; Romano, Cirillo, Favino, & Netti, 2020). Several studies have found a significant positive impact of board gender diversity on ESG performance (Shakil et al., 2021; Nicolò, Zampone, Sannino, & De Iorio, 2021; Khatri, 2023). In the Indian context, Yadav & Prashar (2022) illustrate that a relatively small percentage of female directors has little effect on ESG performance. However, the relationship becomes more favorable when at least three female directors are in place. Buallay, Hamdan, Barone, & Hamdan (2022) find that when female board members make up 22-50% of the board, there is a significant positive effect on ESG disclosure results. However, ESG disclosure exhibits negative returns to scale at levels where female board members comprise more than 50% of the board. Shahbaz, Karaman, Kilic, & Uyar (2020) find that gender diversity on the board impacts ESG indicators.

In contrast to the above, some empirical studies suggest an unrelated relationship between board gender diversity and ESG disclosure; e.g., Manita, Bruna, Dang, & Houanti (2018) find no significant relationship between board gender diversity and ESG disclosure. Prado-Lorenzo & Garcia-Sanchez (2010) found no relationship between board gender diversity and exposure to GHG emissions. Sutiono (2020) found no evidence to support that greater gender diversity on boards leads to better ESG performance. Several other studies have found that gender diversity on boards negatively affects ESG disclosure (Cucari et al., 2018; Husted & de Sousa-Filho, 2019). Considering the above, we propose the following hypothesis:

H2: Board gender diversity has a significant positive effect on ESG performance.

2.3 Corporate Performance and ESG

Waddock & Graves (1997) proposed slack resources theory (SRT), which suggests that firms with higher financial performance may have more funds to invest in ESG practices. Conversely, lower financial performance limits a firm's ability to spend resources on ESG. Past studies have found a significant positive relationship between a firm’s financial performance and a firm's ESG performance (Ortas, Álvarez, & Garayar, 2015; Chams, García-Blandón, & Hassan, 2021; Hamdi, Guenich, & Ben Saada, 2022). Moneva, Bonilla-priego, & Ortas (2020) found that, in contradiction to the slack resource theory, higher financial performance of tourism companies is associated with lower commitment to sustainability. Abdi, Li, & Càmara-Turull (2022) studied the airline industry and found a negative relationship between firms' financial performance and ESG. Considering the above, we propose the following hypothesis:

H_3: Firm performance has a significant positive impact on ESG performance

3. METHODS

This study's complex regression model and variable measures are described as follows.

$$ROA = \alpha_0 + \beta_1 \times BGD + \beta_2 \times SIZE + \beta_3 \times LEV + \beta_4 \times Tobin's\ Q + \varepsilon \quad (1)$$

and

$$ESG = \alpha_0 + \beta_1 \times BGD + \beta_2 \times ROA + \beta_3 \times SIZE + \beta_4 \times LEV + \beta_5 \times Tobin's\ Q + \varepsilon \quad (2)$$

Where ROA is after-tax net income/average total assets $\times$ 100%; ESG is ESG performance; BGD is board gender diversity; SIZE is the logarithm of the firm's assets; LEV is total debt/total assets $\times$ 100%; Tobin's Q is the ratio of the firm's market value to the replacement cost of its assets; and ε is the error term. The dependent variables in this study are return on assets (ROA) and ESG score (ESG). Return on Assets (ROA) is a standardized accounting measure of financial performance commonly used in the literature as a proxy for firm performance (Adams & Ferreira, 2009; Carter et al., 2003).ESG: ESG score, the ESG performance of a firm, is measured by the ESG score used in several previous studies (Manita et al., 2018; Romano et al., 2020), and in this study, the following four measures were used: TESG: company ESG score; EScore: score of environmental factors in company ESG; SScore: score of social factors in company ESG; GScore: score of corporate governance factors in company ESG.

The leading independent variables in this study are Board Gender Diversity (BGD) and Return on Assets (ROA). Board Gender Diversity (BGD) is measured in four ways: F: the total number of female directors.; Fflag: a dummy variable coded as one if there are female directors, otherwise it is coded as 0; BIGFflag: a dummy variable coded as one if the number of female directors is more than 3, otherwise it is coded as 0; Fpercent: the ratio of female directors, it is the number of female directors divided by the number of all directors × 100%. Return on assets (ROA) is a standardized accounting measure of financial performance commonly used in the literature as a proxy for firm performance (Adams & Ferreira, 2009; Carter et al., 2003).

In line with previous studies that control for other variables that may affect ESG performance, we include three control variables in our study because they have a significant impact on a firm's ESG performance, including (1) firm size (SIZE): the firm's total assets, taken as the natural logarithm, (2) liability ratio (LEV): total liabilities divided by total assets multiplied by 100%, and (3) growth opportunity: the firm's market value to the replacement cost of its assets (Tobin's Q). The sample consists of 313 company data from Taiwan Economic Journal (TEJ) observations of listed companies in Taiwan from 2017 to 2021 in trade and department stores, tourism and hospitality, and finance and insurance.

4. RESULTS AND DISCUSSION

These assumptions were tested based on regression analysis. Descriptive statistics are shown in Table 4, including the mean, standard deviation, maximum and minimum values for each variable. Table 5 shows the Pearson correlation coefficients for each variable.

Table 4. Sample descriptive statistics

Variables	Mean	SD	Max.	Min.
1. F	2.12	1.78	9.00	0
2. Fflag	.82	.38	1.00	0
3. BIGFflag	.35	.48	1.00	0
4. Fpercent	.20	.15	.71	0
5. TESG	58.56	8.27	79.27	40.24
6. ESCORE	59.18	13.66	87.53	30.20
7. SSCORE	60.91	12.43	86.31	28.55
8. GSCORE	58.83	9.95	77.40	29.14
9. ROA	2.35	5.17	25.02	-10.51
10. SIZE	1082689889.00	1982217051.00	1.01e10	997463.00
11. LEV	.70	.26	.98	.12
12. Tobins Q	.56	.67	3.90	.02

Source: Organized by this study

The past studies show different results on the effect of gender diversity in the board of directors on company performance. In order to find out the effect of gender diversity in the board of directors on firm performance, in Table 6, it is found that the effect of gender diversity in the board of directors on firm performance is positive, where the number of female directors is more significant than (and including) 3 factor has a significant and positive effect on firm performance, which is consistent with the results of Brahma et al. (2021) and Garanina & Muravyev (2021). The other three factors are insignificant, therefore hypothesis 1 is partially valid. To rule out multicollinearity, VIF values are computed. They indicate that multicollinearity is not a concern since all values are below the threshold of 4(O'brien, 2007).

Table 5. Pearson correlation

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. F	-											
2. Fflag	.55***	-										
3.BIGFflag	.79***	.40***	-									
4. Fpercent	.86***	.61***	.74***	-								
5. TESG	.12**	-.00	.13**	-.04	-							
6. ESCORE	.01	-.03	.05	-.09*	.55***	-						
7. SSCORE	.10*	-.10*	.10*	.10*	.84***	.39***	-					
8. GSCORE	.11*	.10*	.12*	.08	.67***	.08	.27***	-				
9. ROA	.09	.11*	.16***	.13**	.01	.08	-.04	-.01	-			
10. SIZE	-.06	-.16***	-.01	-.22***	.39***	.47***	.40***	.10*	-.16***	-		
11. LEV	-.12**	-.26***	-.09	-.26***	.40	.41***	.41***	.08	-.02	.48***	-	
12. Tobins Q	.13**	.20***	.13**	.28***	.19***	.30***	.22***	.06	.34***	.37***	0.65***	-

Source: Organized by this study

Table 6. Relationship between board gender diversity and ROA

Dependent Variables	Model 1	Model 2	Model 3	Model 4
F	.09			
Fflag		.08		
BIGFflag			1.16**	
Fpercent				1.17
SIZE	1.14***	1.15***	1.11***	1.21***
LEV	-6.51***	-6.47***	-6.44***	-6.60***
Tobins Q	2.34***	2.36***	2.24***	2.32***
Constant	-3.68	-4.00	-3.66	-4.31
Adj.R^2	.15	.15	.16	.15
VIF	1.02~3. 06	1.07~3.06	1.01~3. 06	1.12~3.13
N	313	313	313	313

*p-value <.1; ** p-value <.05; *** p-value <.01

The effect of board gender diversity on ESG performance has been inconsistent in past studies. In order to investigate the effect of board gender diversity on ESG performance, in Table 7, we find that board gender diversity has a significant and positive effect on firms' ESG performance, which is consistent with the results of past studies (Birindelli et al., 2018; Shakil et al., 2021; Khatri, 2023), so Hypothesis 2 is valid. Also, we found that board gender diversity has a significant and positive effect on the performance of corporate governance factors in firms' ESG performance (Table 11), consistent with the study of Shahbaz et al. (2020).

Table 7. Relationship between board gender diversity, ROA and TESG

Dependent Variables	Model 1	Model 2	Model 3	Model 4
ROA	.13	.13	.11	.04
F	.69 ***			
Fflag		2.62 **		
BIGFflag			2.31 ***	
Fpercent				6.04 **
SIZE	3.54 ***	3.69 ***	3.55 ***	3.76 ***
LEV	6.23 **	6.40 **	5.85 **	5.17 *
Tobins Q	2.85 ***	3.01 ***	2.84 ***	2.97 ***
Constant	22.60 ***	20.47 ***	23.44 ***	21.71 ***
Adj.R^2	.27	.27	.27	.26
VIF	1.02~3.12	1.04~3.14	1.03~3.14	1.13~3.22
N	313	313	313	313

*p-value <.1;** p-value <.05;*** p-value <.01

There are different results in past studies on the effect of firm performance on firms' ESG performance. In order to investigate the relationship between corporate performance and firms' ESG performance, in Table 8, we find that corporate performance has a positive but insignificant effect on firms' ESG performance, which is consistent with the study of Waddock & Graves (1997). We also find that corporate performance has a significant and positive effect on the environmental factors of corporate ESG, a positive but insignificant effect on the performance of the social factors, and a negative but insignificant effect on the performance of the corporate governance factors. We find the same results in Tables 9 to 11, which consider the gender diversity of the board of directors. Summarizing the above, Hypothesis 3 is only partially supported.

Table 8 Relationship between ROA and ESG performance

Dependent Variable	TESG	ESCORE	SSCORE	GSCORE
ROA	.13	.56***	.09	-.05
SIZE	3.60***	8.24***	6.15***	.98
LEV	5.76***	6.99	5.69	4.84
Tobins Q	3.02***	.31	4.32***	3.36***
Constant	23.74***	10.97	5.16	43.89***
Adj.R^2	.26	.28	.28	. 018
VIF	1.18~3.13	1.19~3.13	1.19~3.13	1.19~3.13
N	313	313	313	313

*p-value <.1;** p-value <.05;*** p-value <.01

Table 9. Relationship between ROA, board gender diversity and ESCORE

Dependent Variable	Model 1	Model 2	Model 3	Model 4
ROA	.55***	.55***	.54***	.55***
F	.36			
Fflag		3.37*		
BIGFflag			1.56	
Fpercent				5.34
SIZE	5.20***	5.35***	5.20***	5.43***
LEV	7.23	7.81*	7.05	6.86
Tobins Q	.22*	.30	.19	.19
Constant	10.37	6.77	10.77	8.53
Adj.R^2	.28	.29	.28	.29
VIF	1.02~3.14	1.07~3.14	1.03~3.14	1.13~3.22
N	313	313	313	313

*p-value <.1;** p-value <.05;*** p-value <.01

Table 10. Relationship between ROA, board gender diversity and SSCORE

Dependent Variable	Model 1	Model 2	Model 3	Model 4
ROA	.08	.09	.06	.08
F	.91**			
Fflag		.81		
BIGFflag			2.94**	
Fpercent				4.61
SIZE	6.07***	6.18***	6.01***	6.32***
LEV	6.31	5.89	5.80	5.58
Tobins Q	4.09***	4.31***	4.09***	4.22***
Constant	3.65	4.15	4.77	3.05
Adj.R^2	.29	.28	.29	.28
VIF	1.02~3.14	1.07~3.14	1.03~3.14	1.07~3.14
N	313	313	313	313

*p-value <.1;** p-value <.05;*** p-value <.01

Table 11 Relationship between ROA, board gender diversity and GSCORE

Dependent Variable	Model 1	Model 2	Model 3	Model 4
ROA	-.06	-.06	-.08	-.06
F	.61*			
Fflag		3.36**		
BIGFflag			2.36**	
Fpercent				6.52*
SIZE	.91	1.08	.92	1.21
LEV	5.25	5.66	4.93	4.68
Tobins Q	3.21***	3.34***	3.17***	3.22***
Constant	42.87***	39.69***	43.58***	40.91***
Adj.R^2	.03	.03	.03	.02
VIF	1.02~3.14	1.07~3.14	1.03~3.14	1.13~3.2
N	313	313	313	313

*p-value <.1;** p-value <.05;*** p-value <.01

5. CONCLUSIONS

5.1. Finding

The data from 2017 to 2021 shows that among the boards of directors of listed companies in Taiwan have female directors. In order to strengthen the diversity of directors, and considering that the promotion of female directors is an international trend, the Taiwan Financial Supervisory Commission (TFSC) will promote the appointment of at least one female director by the expiration date of the directors by 2024, and those listed companies that do not have one-third of female directors by 2025 will be required to disclose the reasons for this in their annual reports as well as the measures taken. Against this backdrop, it is essential to promptly understand the consequences of women's participation in the boardroom.

In this study, we attempt to deepen our understanding of the impact of board gender diversity on firm performance and firm ESG performance. Our findings make three significant contributions to the theory of the impact of board gender diversity. First, the results show that board gender diversity positively impacts firm performance. However, the number of female directors is significant and positive when the number of female directors is more excellent than (or including) three. In this regard, when considering the composition of the board of directors, it is necessary to consider that the number of female directors can be greater than (inclusive of) 3 to benefit the company's performance. When the government promotes the policy of gender diversity on the board of directors, it can also give priority to promoting the company's female directors to have several female directors greater than (inclusive of) 3 to encourage the company to have the motivation to cooperate with the policy. Another significant contribution of the study is that it helps to increase the impact of gender diversity on corporate ESG performance. Impact Understanding. Board gender diversity significantly and positively impacts firms' ESG performance. However, it has different impacts on the performance of environmental, social and corporate governance factors, with a significant and positive impact on the performance of corporate governance factors, which can help firms understand how to increase their ESG performance in the process of promoting board gender diversity, especially in terms of the performance of corporate governance factors. Corporate governance performance has also been enhanced by the government's policy of promoting board gender diversity.

Finally, this study helps to understand the impact of corporate performance on firms' ESG performance. We found that corporate performance has different impacts on the performance of environmental factors, social factors and corporate governance factors in corporate ESG performance, among which there is a significant and positive impact on the performance of environmental factors, which helps companies to understand how to increase corporate ESG performance in the process of promoting the increase of corporate performance, especially in terms of the performance of environmental factors, which can enhance the motivation of companies to promote sustainable development.

5.2. Management application

The authors believe this paper will contribute to exploring the relationship between gender diversity on boards, corporate performance and corporate sustainability in Taiwan. The Taiwan Financial Supervisory Commission (TFSC) will promote the appointment of at least one female director in IPO companies from 2023 and at least one female director by 2024 by the expiration date of the term of directorship. Suppose the number of female directorships in IPO companies is less than one-third of the total number in 2025. In that case, the company should disclose the reasons and measures taken in the annual report. Considering that the promotion of female directors is an international trend and that female directors are more sensitive to social, environmental, and ethical issues and are more concerned about the interests of stakeholders than male directors (Fernandez et al., 2019; Zahid et al., 2020), after empirical studies, we do find that gender diversity in the board of directors is effective in enhancing firm performance and contributing to the sustainability of the firms. Corporations and governments may wish to prioritize starting with more than (and including) three female directors.

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