

The Relationship between Corporate Sustainability Performance and Earnings Management-the Role of Female Independent Director

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ABSTRACT

Corporate social responsibility is a company's commitment to continue to abide by ethical norms, contribute to economic development, and assume responsibility to all stakeholders to achieve economic, social and governance objectives. Regarding the relationship between corporate sustainability performance (ESG) and earnings management, there are different theories and the findings are mixed. The purpose of this paper is to investigate the relationship between ESG and earnings management.

Using data from 2015 to 2020 in Taiwan, this study shows that ESG is associated with lower earnings management, proxied by absolute discretionary accruals. In addition, the relationship between ESG and earnings management is moderated by female independent directors, indicating that female independent directors can further mitigate earnings management. The research results may have policy implications to investors, academic, and practitioners.

Keywords: Corporate sustainability report, ESG, Earnings management, Corporate social responsibility

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1. Introduction

According to the definition of the World Business Council for Sustainable Development (WBCSD), corporate social responsibility is a company's commitment to continue to abide by ethical norms, contribute to economic development, and improve the lives of employees and their families, local communities and society as a whole. In addition to making profits and meeting the requirements of shareholders, the corporate goal also needs to assume responsibilities to stakeholders such as customers, suppliers, employees, creditors, communities, and the natural environment, in order to achieve the concepts of economic prosperity, social welfare, and environmental sustainability. Therefore, under corporate social responsibility, enterprises not only aim at their own profit, but also integrate the goals of environment (E), society (S), and governance (G) (hereafter referred to as ESG or corporate sustainability performance). Past studies have believed that companies engaging in ESG activities will have positive benefits to the company, including improving the company's reputation, building customer and social trust, enhancing company transparency, maintaining sustainable competitiveness, and maximizing profits.

The effect of corporate social responsibility performance on earnings management has been discussed in academia and practice. Some studies have pointed out that companies engaging in corporate social responsibility activities can help alleviate corporate agency problems, thereby reducing the phenomenon of information asymmetry (Cheng et al. 2014). Corporate social responsibility can mitigate corporate earnings management (Kim et al. 2012; Cho and Chun 2016).

With the rise of women's consciousness, women's education level has improved a lot,

which has also improved their socioeconomic status. Dalton and Dalton (2009) point out Fortune 500 female directors increased from 12% to 15%, among which the proportion of female members of the audit committee increased from 11% to 19%. In the European Union, during 2003-2011, the proportion of female directors increased from 8.5% to 13.7%. From the above, it can be seen that the proportion of women presents a slowly rising trend.

According to agency theory, Adams and Ferreira (2009) find that boards with female participation have stronger monitoring, higher independence, and more executive stock compensation plans. According to resource dependence theory, Hillman et al. (2007) divide the resources provided by directors into human capital and social capital. Since male and female directors have their own capital networks, boards with female directors can enhance the cooperation between enterprises and the external environment in more aspects. Post and Byron (2015) find that the impact of female directors on corporate performance is in the dual functions of supervision and strategic consultation of the board of directors. Liu et al. (2014) argue that increasing the proportion of female directors in the Chinese market can improve the company's business performance. Companies with at least one female director have higher performance than companies without female directors; companies with three or more female directors have a more significant impact, possibly due to the critical majority theory.

There are two research questions in this study: First, what is the relationship between corporate sustainability performance and earnings management. Second, whether female independent directors play a moderating role in the relationship between corporate sustainability performance and earnings management.

The remainder of this paper proceeds as follows. The next section reviews the prior literature and develops research hypotheses. Section III describes the research design, including the sample, variables measurement and empirical models. Section IV reports the results. The

final section contains our conclusion.

2. Literature review and hypothesis development

Corporate sustainability performance and earnings management

Freeman (1984) proposes the stakeholder theory, arguing that the objectives of business operations should be responsible for stakeholders. The company's corporate social responsibility activities (equivalent to corporate sustainability performance) are not just based on profit maximization, economic and social goals also need to be considered. Under the above view, companies will reduce their earnings management behavior. Kim et al. (2012) find that managers' engagement in corporate social responsibility activities is a manifestation of moral conscience, so companies with social responsibility will not engage in earnings management behaviors. Based on the research of Korean companies, Lim and Choi (2013) and Cho and Chun (2016) both believe that corporate social responsibility can mitigate earnings management. Thus, we expect higher corporate sustainability performance will mitigate earnings management behavior, leading to our first hypothesis:

H1: Firms with a high corporate sustainability performance are associated with lower earnings management.

Moderating effect of female independent directors

With the rise of gender awareness, coupled with the improvement of modern women's education level and social status, more and more companies recruit female directors. Prior research indicates that women are more likely to express concern for others (Beutel and Marini 1995), and it is easy to respond to the needs and propositions of the society (Adams and Funk 2012). There are female directors on the board of directors, a firm may pay more attention to corporate social responsibility. Eagly et al. (2003) indicate that compared with men, women are more helpful, kind, compassionate, interpersonally sensitive, and concerned about the well-being

of others. This makes female directors more active in establishing relationships with many stakeholders. Barako and Brown (2008) show that the higher the proportion of female directors on the board of directors, the higher the willingness of the company to disclose corporate social responsibility. Female directors in firms will affect the disclosure quality of corporate social responsibility reports.

Based on the research done by female independent directors, Benkraiem et al. (2017) argue that female independent directors can monitor CEO compensation, and when the number of female directors increases, the company will limit earnings management. Karavitis et al. (2021) believe that female independent directors have a greater impact on reducing interest rates than female directors. Chen et al. (2017) find evidence from the United States that the number of female directors is directly proportional to the increase in dividends paid, and female independent directors have a greater influence.

From the above research, female directors should have a positive impact on earnings management. This study focuses on female independent directors who have higher responsibilities and rights than female directors. In the relationship between sustainability report performance and earnings management, female independent directors should have a positive moderating effect. We thus develop our second hypothesis as follows:

H2. The negative association between corporate sustainability performance and earnings management is strengthened by female independent director.

3. Research method

Data and sample selection

The outcome variables used to test the effect of corporate sustainability performance on earnings management is absolute discretionary accruals. All related financial variables were collected from the Taiwan Economic Journal Database (TEJ). The sample consists of listed

companies for the period from 2015 to 2020 and 7,964 observations for the earnings management analysis. We winsorize all continuous variables at the 1 percent and 99 percent (Duh et al. 2020).

Measurement of main variables

Measure of corporate sustainability performance

In this study, the Enterprise Sustainability Index (*TESG*) of TEJ is used as a proxy variable for corporate sustainability report performance. *TESG* score, ranging from 0 to 100, is a combination of three dimensions: environment (E), society (S), and governance (G). The higher the score, the higher the performance of the corporate sustainability report. In addition, the paper also uses the rank of corporate sustainability performance to test the hypothesis. This study defines *REV_RANK* as 817 minus rank score in each industry. Same as *TESG*, the higher *REV_RANK* means the higher performance.

Measure of female independent director

We use three variables to proxy female independent director, including $FEMD = 1$ if at least one female independent director in the firm, 0 otherwise; $FEMR =$ ratio of female independent directors in all independent directors in the firm; $FEMN =$ number of female independent directors in the firm.

Earnings management measure

This paper uses the magnitude of absolute discretionary accruals to measure earnings management (Frankel et al. 2002; Chen et al. 2008; DeFond, Raghunandan, and Subramanyam 2002). Discretionary accruals (*DA*) are calculated using a two-step process based on the following formulas:

$$TA_{it}/A_{it-1} = \delta_0 + \delta_1(1/A_{it-1}) + \delta_2[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + \delta_3(PPE_{it}/A_{it-1}) + \delta_4ROA_{it-1} + \varepsilon_{it} \quad (1)$$

$$DA_{it} = TA_{it}/A_{it-1} - \{\widehat{\delta}_0 + \widehat{\delta}_1(1/A_{it-1}) + \widehat{\delta}_2[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + \widehat{\delta}_3(PPE_{it}/A_{it-1}) + \widehat{\delta}_4ROA_{it-1}\} \quad (2)$$

where TA = total accruals, defined as net income before extraordinary items minus operating cash flows; A = total assets, defined as natural logarithm of total assets; ΔREV = change in net sales; ΔREC = change in accounts receivable; PPE = gross property, plant, and equipment; ROA = return on total assets; and ε is the error term. Following Kothari, Leone and Wasley (2005), we use performance-adjusted discretionary accruals and estimate model (1) in cross-section in each year for each TEJ industry classification with at least ten observations using all companies with the required data in the TEJ database. Model (2) is estimated to obtain the residuals as discretionary accruals (DA). Consistent with prior research (e.g., Chen et al. 2008), we use absolute discretionary accruals ($absDA$) as a proxy for earnings management.

Empirical models

To examine the effect of corporate sustainability performance on earnings management, we estimate the models described below.

$$absDA_t = \alpha_0 + \alpha_1TESG_t + \alpha_2LN_TA_t + \alpha_3CACL_t + \alpha_4LEV_t + \alpha_5LOSS_t + \alpha_6BVMV_t + \alpha_7PROFIT_t + \alpha_8GROWTH_t + \alpha_9CFO_t + \alpha_{10}CYCLE_t + \alpha_{11}CAPINT_t + \alpha_{12}PRI_DA_t + \alpha_{13}AGE_t + \alpha_{14}BIG4_t + \varphi \cdot YEAR + \varepsilon_t \quad (3)$$

where absolute discretionary accruals ($absDA$) is the dependent variable, and a firm's Enterprise Sustainability Index ($TESG$) is the primary independent variable. Based on hypothesis H1, we expect the coefficient of $TESG$ to be negative.

We include *LN_TA* to control for the size of the firm, measured by the natural logarithm of total assets, as large companies tend to report lower accruals (Francis and Yu 2009; Chi et al. 2012). *CACL* controls the effect of liquidity, and is measured by the ratio of current assets to current liabilities (Butler et al. 2004). *LEV* and *LOSS* are included to control for the effects of companies' financial distress (DeFond and Jiambalvo 1994), where *LEV* is the ratio of total debt to assets, and *LOSS* equals 1 if net income is negative, 0 otherwise. *BVMV* and *GROWTH* control for the effects of growth on a firm's accruals (Ashbaugh et al. 2003; Myers et al. 2003; Chen et al. 2008), where *BVMV* is the book-to-market value of common equity at year-end, and *GROWTH* is measured by the percentage increase in net sales over the previous year. *PROFIT* is included as a control variable (Klein 2002) defined as net income scaled by total assets. *CFO* controls for the association between cash flows from operations and discretionary accruals (Chen et al. 2008; Francis et al. 2014). We also control for *CYCLE*, the natural logarithm of the days of the company's operation cycle; *CAPINT*, capital intensity measured as net property, plant, and equipment scaled by net sales; and *PRI_DA*, the prior year's absolute discretionary accruals (Dechow et al. 1994; Francis et al. 1999).

In addition to *TESG*, we also use the reverse sustainability report performance ranking (*REV_RANK*). If *REV_RANK* can mitigate corporate earnings management behavior, the coefficient of *REV_RANK* should be significantly negative.

To test the hypothesis H2, we develop model (4) as follows:

$$\begin{aligned}
absDA_t = & \alpha_0 + \alpha_1 TESG_t + \alpha_2 Female_t + \alpha_3 TESG \times Female_t + \alpha_4 LN_TA_t \\
& + \alpha_5 CACL_t + \alpha_6 LEV_t + \alpha_7 LOSS_t + \alpha_8 BVMV_t + \alpha_9 PROFIT_t \\
& + \alpha_{10} GROWTH_t + \alpha_{11} CFO_t + \alpha_{12} CYCLE_t + \alpha_{13} CAPINT_t \\
& + \alpha_{14} PRI_DA_t + \alpha_{15} AGE_t + \alpha_{16} BIG4_t + \varphi \cdot YEAR + \varepsilon_t
\end{aligned} \tag{4}$$

Female independent directors (*Female*) is proxied by *FEMD*, *FEMR*, or *FEMN*. We

expect the coefficient of interaction between Enterprise Sustainability Index (*TESG*) and female independent director (*Female*) to be negative if H2 is supported.

4. Results

Descriptive statistics

Table 1 presents descriptive statistics for variables used in the models. As to earnings management variable, the mean of *absDA* is 0.0538, consistent with Duh et al. (2020) and Chen et al. (2008). In the main independent variables, average *TESG* is 54.8475 on a 0-100 score and *REV_RANK* is 615. About 25.9% of firms have at least one female independent director. The proportion of female directors is 11.06% and average 0.29 female independent director in each firm.

[Please insert Table 1 about here]

Correlation analysis

We present correlation matrices in Table 2. It indicates that *TESG* and *REV_RANK* both are negatively and significantly associated with *absDA* ($p < 0.01$), suggesting preliminary evidence that corporate sustainability performance mitigates earnings management (absolute discretionary accruals), but they are obtained without considering control variables. We report the results of multiple regression below. The absolute values of correlation coefficients among all control variables are less than 0.75, suggesting that multicollinearity is not a concern (Anderson et al. 1999).

[Please insert Table 2 about here]

Test for the effect on earnings management

Table 3 presents the multiple regression analysis of absolute discretionary accruals. We find that *TESG* is negatively associated with *absDA* ($p < 0.01$), suggesting that corporate sustainability performance decreases earnings management. In addition, the coefficient of

REV_RANK has similar result, so H1 is supported.

[Please insert Table 3 about here]

Test for the moderating effect of female independent director

H2 predicts that the association between the corporate sustainability performance and the earnings management is moderated by female independent directors, which means that the coefficient of the interaction term ($TESG \times Female$) ought to be negative. Consistent with the hypothesis, the coefficient of the interaction term is negative and statistically significant ($p = 0.1$, one-tailed test) in all three proxy variables of *Female* in Panel A of TABLE 4. In other words, corporate sustainability performance mitigate earnings management by decreasing absolute discretionary accruals, this tendency is further strengthened by female independent directors. Results support H2. Using *REV_RANK* as a proxy of corporate sustainability performance, Panel B of TABLE 4 shows the coefficient of the interaction term is negative but insignificant. H2 is not supported. In summary, H2 is partially supported.

[Please insert Table 4 about here]

5. Summary

This study investigates the association between corporate sustainability performance and earnings management. Based on data from 2015 to 2020 in Taiwan, consistent with prediction, we find that high score of corporate sustainability performance is negatively and significantly related with earnings management as manifested by lower absolute discretionary accruals. More importantly, the empirical evidence partially supports the hypothesis that female independent directors moderate the association between corporate sustainability performance and audit quality, suggesting that female independent directors are a mechanism through which further mitigates the association between corporate sustainability performance and earnings management.

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TABLE 1
Descriptive Statistics

	Mean	SD	Max	Min
<i>absDA</i>	0.0538	0.0547	0.3016	0.0005
<i>TESG</i>	54.8475	7.7326	83.7300	34.2000
<i>REV_RANK</i>	615.5254	204.5308	816.0000	1.0000
<i>FEMD</i>	0.2590	0.4381	1.0000	0.0000
<i>FEMR</i>	11.0591	20.3142	100.0000	0.0000
<i>FEMN</i>	0.2924	0.5268	3.0000	0.0000
<i>LN_TA</i>	15.4229	1.4422	19.9112	12.5730
<i>CACL</i>	263.7056	231.4386	1573.3400	49.4700
<i>LEV</i>	41.9619	17.8355	84.4300	5.6200
<i>LOSS</i>	0.2185	0.4132	1.0000	0.0000
<i>BVMV</i>	0.7845	0.4284	2.1277	0.1186
<i>PROFIT</i>	3.7235	7.8988	23.3500	-27.4900
<i>GROWTH</i>	4.2040	34.9361	218.9100	-69.7600
<i>CFO</i>	0.0600	0.0923	0.2928	-0.2563
<i>CYCLE</i>	5.0765	0.8026	8.0867	2.4484
<i>CAPINT</i>	0.5257	0.7021	4.7036	0.0031
<i>PRI_DA</i>	0.0545	0.0552	0.2997	0.0006
<i>AGE</i>	2.4969	0.7870	3.9318	0.0000
<i>BIG4</i>	0.8916	0.3109	1.0000	0.0000
Observations		7,964		

Variable definitions: *absDA* = Absolute discretionary accruals; *TESG* = Corporate sustainability score; *REV_RANK* = 817 minus rank score in each industry; *FEMD* = 1 if at least one female independent director in the firm, 0 otherwise; *FEMR* = ratio of female independent directors in the all independent directors in the firm; *FEMN* = number of female independent directors in the firm; *LN_TA* = Natural logarithm of total assets at year-end; *CACL* = Ratio of current assets to current liabilities; *LEV* = Ratio of total debt to assets; *LOSS* = 1 if net income is negative, 0 otherwise; *BVMV* = Book-to-market value of common equity at year-end; *PROFIT* = Net income scaled by total assets; *GROWTH* = Growth rate of net sales over the previous year; *CFO* = Operating cash flows deflated by total assets; *CYCLE* = Natural logarithm of the days of the company's operation cycle; *CAPINT* = Net property, plant, and equipment scaled by net sales; *PRI_DA* = Prior year's absolute discretionary accruals; *AGE* = Natural logarithm of the number of years in which the company is listed; *BIG4* = 1 if audited by the big 4 CPA firm, 0 otherwise.

TABLE 2
Correlation Matrix (n = 7,964)

	<i>absDA</i>	<i>TESG</i>	<i>REV_RANK</i>	<i>FEMD</i>	<i>FEMR</i>	<i>FEMN</i>	<i>LN_TA</i>	<i>CACL</i>	<i>LEV</i>	<i>LOSS</i>	<i>BVMV</i>	<i>PROFIT</i>	<i>GROWTH</i>	<i>CFO</i>	<i>CYCLE</i>	<i>CAPINT</i>
<i>absDA</i>	1.0000															
<i>TESG</i>	-0.1015 (<0.001)	1.0000														
<i>REV_RANK</i>	-0.0846 (<0.001)	0.6257 (<0.001)	1.0000													
<i>FEMD</i>	-0.0038 (0.733)	0.0230 (0.041)	0.0099 (0.375)	1.0000												
<i>FEMR</i>	-0.0032 (0.773)	0.0013 (0.905)	0.0019 (0.868)	0.9208 (<0.001)	1.0000											
<i>FEMN</i>	-0.0031 (0.781)	0.0253 (0.024)	0.0154 (0.169)	0.9389 (<0.001)	0.9648 (<0.001)	1.0000										
<i>LN_TA</i>	-0.1166 (<0.001)	0.4325 (<0.001)	0.3125 (<0.001)	-0.0163 (0.147)	-0.0394 (<0.001)	-0.0060 (0.592)	1.0000									
<i>CACL</i>	0.0179 (0.109)	-0.0746 (<0.001)	-0.0694 (<0.001)	-0.0002 (0.983)	-0.0064 (0.570)	-0.0058 (0.603)	-0.2496 (<0.001)	1.0000								
<i>LEV</i>	0.0575 (<0.001)	0.0256 (0.022)	0.0831 (<0.001)	-0.0094 (0.400)	-0.0058 (0.606)	-0.0046 (0.684)	0.3198 (<0.001)	-0.6449 (<0.001)	1.0000							
<i>LOSS</i>	0.0703 (<0.001)	-0.2421 (<0.001)	-0.1824 (<0.001)	-0.0234 (0.037)	-0.0080 (0.473)	-0.0161 (0.152)	-0.2668 (<0.001)	0.0455 (<0.001)	0.0724 (<0.001)	1.0000						
<i>BVMV</i>	-0.0622 (<0.001)	-0.1122 (<0.001)	-0.0569 (<0.001)	-0.0701 (<0.001)	-0.0495 (<0.001)	-0.0570 (<0.001)	0.1322 (<0.001)	-0.0007 (0.952)	-0.0123 (0.273)	0.1552 (<0.001)	1.0000					
<i>PROFIT</i>	-0.0519 (<0.001)	0.2408 (<0.001)	0.1819 (<0.001)	0.0357 (0.001)	0.0144 (0.200)	0.0222 (0.048)	0.2333 (<0.001)	-0.0049 (0.661)	-0.1557 (<0.001)	-0.7094 (<0.001)	-0.2819 (<0.001)	1.0000				
<i>GROWTH</i>	0.0981 (<0.001)	0.0298 (0.008)	0.0444 (<0.001)	-0.0037 (0.740)	-0.0012 (0.912)	-0.0004 (0.973)	0.0347 (0.002)	-0.0229 (0.041)	0.0506 (<0.001)	-0.1568 (<0.001)	-0.1831 (<0.001)	0.2055 (<0.001)	1.0000			
<i>CFO</i>	-0.1357 (<0.001)	0.2286 (<0.001)	0.1400 (<0.001)	0.0338 (0.003)	0.0100 (0.370)	0.0245 (0.029)	0.1663 (<0.001)	-0.0442 (<0.001)	-0.1511 (<0.001)	-0.4158 (<0.001)	-0.2024 (<0.001)	0.5921 (<0.001)	0.0497 (<0.001)	1.0000		
<i>CYCLE</i>	0.0464 (<0.001)	-0.1140 (<0.001)	-0.0339 (0.003)	-0.0360 (0.001)	-0.0182 (0.104)	-0.0279 (0.013)	-0.0464 (<0.001)	0.1030 (<0.001)	0.0125 (0.265)	0.0669 (<0.001)	0.1229 (<0.001)	-0.1263 (<0.001)	-0.0279 (0.013)	-0.2061 (<0.001)	1.0000	
<i>CAPINT</i>	-0.0663 (<0.001)	-0.0817 (<0.001)	0.0836 (<0.001)	0.0001 (0.993)	0.0058 (0.606)	0.0109 (0.329)	0.0206 (0.066)	0.0516 (<0.001)	0.0055 (0.626)	0.2378 (<0.001)	0.1210 (<0.001)	-0.2413 (<0.001)	-0.0804 (<0.001)	-0.1351 (<0.001)	0.0135 (0.229)	1.0000
<i>PRI_DA</i>	0.2551 (<0.001)	-0.1099 (<0.001)	-0.0907 (<0.001)	-0.0083 (0.458)	-0.0072 (0.522)	-0.0082 (0.463)	-0.1362 (<0.001)	0.0399 (<0.001)	0.0396 (<0.001)	0.0987 (<0.001)	-0.0562 (<0.001)	-0.0917 (<0.001)	0.0258 (0.021)	-0.1050 (<0.001)	0.0486 (<0.001)	-0.0497 (<0.001)
<i>AGE</i>	-0.0498 (<0.001)	0.1226 (<0.001)	0.0917 (<0.001)	-0.0410 (<0.001)	-0.0126 (0.260)	-0.0296 (0.008)	0.3345 (<0.001)	-0.0928 (<0.001)	0.1274 (<0.001)	0.0353 (0.002)	0.2331 (<0.001)	-0.0997 (<0.001)	-0.0540 (<0.001)	-0.0928 (<0.001)	0.0471 (<0.001)	0.0602 (<0.001)
<i>BIG4</i>	-0.0474 (<0.001)	0.1484 (<0.001)	0.0826 (<0.001)	0.0236 (0.036)	0.0158 (0.160)	0.0233 (0.038)	0.1227 (<0.001)	-0.0420 (<0.001)	-0.0241 (0.031)	-0.1031 (<0.001)	-0.0398 (<0.001)	0.1102 (0.073)	0.0201 (<0.001)	0.1009 (<0.001)	-0.0746 (<0.001)	-0.0347 (0.002)

TABLE 2 (continued)

	<i>PRI_DA</i>	<i>AGE</i>	<i>BIG4</i>
<i>PRI_DA</i>	1.0000		
<i>AGE</i>	-0.0769 (<0.001)	1.0000	
<i>BIG4</i>	-0.0421 (<0.001)	-0.1453 (<0.001)	1.0000

Please refer to TABLE 1 for variable definitions; parentheses are significance levels.

TABLE 3
Corporate Sustainability Performance and Earnings Management

<u>Main Variable</u>	<u>TESG</u>				<u>REV_RANK</u>			
	<u>Estimate</u>	<u>St. Err.</u>	<u>t-value</u>	<u>p-value</u>	<u>Estimate</u>	<u>St. Err.</u>	<u>t-value</u>	<u>p-value</u>
<i>Intercept</i>	0.0886	0.0085	10.400	<0.001	0.0831	0.0083	10.050	<0.001
<i>TESG</i>	-0.0002	0.0001	-2.640	0.008	–	–	–	–
<i>REV_RANK</i>	–	–	–	–	<0.0001	<0.0001	-2.880	0.004
<i>LN_TA</i>	-0.0025	0.0005	-4.560	<0.001	-0.0027	0.0005	-5.220	<0.001
<i>CACL</i>	<0.0001	<0.0001	2.600	0.009	<0.0001	<0.0001	2.690	0.007
<i>LEV</i>	0.0002	<0.0001	5.150	<0.001	0.0003	<0.0001	5.480	<0.001
<i>LOSS</i>	0.0059	0.0020	2.910	0.004	0.0059	0.0020	2.890	0.004
<i>BVMV</i>	-0.0036	0.0016	-2.310	0.021	-0.0033	0.0015	-2.120	0.034
<i>PROFIT</i>	0.0005	0.0001	3.880	<0.001	0.0005	0.0001	4.050	<0.001
<i>GROWTH</i>	0.0001	<0.0001	7.430	<0.001	0.0001	<0.0001	7.500	<0.001
<i>CFO</i>	-0.0708	0.0082	-8.650	<0.001	-0.0715	0.0082	-8.760	<0.001
<i>CYCLE</i>	0.0007	0.0008	0.970	0.333	0.0009	0.0008	1.140	0.256
<i>CAPINT</i>	-0.0047	0.0009	-5.360	<0.001	-0.0042	0.0009	-4.820	<0.001
<i>PRI_DA</i>	0.2171	0.0108	20.140	<0.001	0.2172	0.0108	20.140	<0.001
<i>AGE</i>	-0.0007	0.0008	-0.850	0.393	-0.0008	0.0008	-0.900	0.366
<i>BIG4</i>	-0.0032	0.0019	-1.670	0.096	-0.0034	0.0019	-1.780	0.076
<i>YEAR</i>		included				included		
Observations		7,964				7,964		
Adjusted R ²		10.19%				10.21%		
F		48.57***				48.65***		

Please refer to TABLE 1 for variable definitions.

TABLE 4
Corporate Sustainability Performance and Earnings Management–Moderating effect

Panel A												
<u>Main Variable</u>	<u>FEMD</u>				<u>TESG</u>				<u>FEMN</u>			
	<u>Estimate</u>	<u>St. Err.</u>	<u>t-value</u>	<u>p-value</u>	<u>Estimate</u>	<u>St. Err.</u>	<u>t-value</u>	<u>p-value</u>	<u>Estimate</u>	<u>St. Err.</u>	<u>t-value</u>	<u>p-value</u>
<i>Intercept</i>	0.0853	0.0089	9.550	<0.001	0.0857	0.0089	9.680	0.000	0.0851	0.0089	9.570	<0.001
<i>TESG</i>	-0.0002	0.0001	-1.720	0.085	-0.0002	0.0001	-1.750	0.081	-0.0002	0.0001	-1.730	0.084
<i>Female</i>	0.0121	0.0094	1.280	0.200	0.0003	0.0002	1.320	0.187	0.0111	0.0080	1.400	0.162
<i>TESG*Female</i>	-0.0002	0.0002	-1.310	0.190	<-0.0001	<0.0001	-1.380	0.167	-0.0002	0.0001	-1.410	0.159
<i>LN_TA</i>	-0.0025	0.0005	-4.550	<0.001	-0.0025	0.0005	-4.590	0.000	-0.0025	0.0005	-4.550	<0.001
<i>CACL</i>	<0.0001	<0.0001	2.570	0.010	<0.0001	<0.0001	2.580	0.010	<0.0001	<0.0001	2.580	0.010
<i>LEV</i>	0.0002	<0.0001	5.110	<0.001	0.0002	<0.0001	5.120	0.000	0.0002	<0.0001	5.110	<0.001
<i>LOSS</i>	0.0059	0.0020	2.910	0.004	0.0060	0.0020	2.920	0.004	0.0060	0.0020	2.920	0.003
<i>BVMV</i>	-0.0036	0.0016	-2.300	0.022	-0.0036	0.0016	-2.300	0.022	-0.0036	0.0016	-2.300	0.022
<i>PROFIT</i>	0.0005	0.0001	3.900	<0.001	0.0005	0.0001	3.910	0.000	0.0005	0.0001	3.900	<0.001
<i>GROWTH</i>	0.0001	<0.0001	7.420	<0.001	0.0001	<0.0001	7.410	0.000	0.0001	<0.0001	7.420	<0.001
<i>CFO</i>	-0.0706	0.0082	-8.630	<0.001	-0.0707	0.0082	-8.640	0.000	-0.0706	0.0082	-8.630	<0.001
<i>CYCLE</i>	0.0008	0.0008	1.000	0.317	0.0008	0.0008	1.000	0.316	0.0008	0.0008	1.010	0.311
<i>CAPINT</i>	-0.0046	0.0009	-5.340	<0.001	-0.0046	0.0009	-5.340	0.000	-0.0046	0.0009	-5.340	<0.001
<i>PRI_DA</i>	0.2171	0.0108	20.130	<0.001	0.2169	0.0108	20.120	0.000	0.2170	0.0108	20.120	<0.001
<i>AGE</i>	-0.0007	0.0008	-0.820	0.411	-0.0007	0.0008	-0.830	0.404	-0.0007	0.0008	-0.820	0.410
<i>BIG4</i>	-0.0033	0.0019	-1.710	0.088	-0.0033	0.0019	-1.700	0.089	-0.0033	0.0019	-1.720	0.086
<i>YEAR</i>		included				included				included		

Observations	7,964	7,964	7,964
Adjusted R ²	10.19%	10.19%	10.19%
F 值	44.03***	44.04***	44.04***

Panel B

Main Variable

REV_RANK

	<u>FEMD</u>				<u>FEMR</u>				<u>FEMN</u>			
	<u>Estimate</u>	<u>St. Err.</u>	<u>t-value</u>	<u>p-value</u>	<u>Estimate</u>	<u>St. Err.</u>	<u>t-value</u>	<u>p-value</u>	<u>Estimate</u>	<u>St. Err.</u>	<u>t-value</u>	<u>p-value</u>
<i>Intercept</i>	0.0827	0.0083	9.910	<0.001	0.0830	0.0083	9.950	0.000	0.0828	0.0083	9.930	<0.001
<i>TESG</i>	<-0.0001	<0.0001	-2.270	0.023	<-0.0001	<0.0001	-2.350	0.019	<-0.0001	<0.0001	-2.390	0.017
<i>Female</i>	0.0021	0.0043	0.500	0.619	<0.0001	0.0001	0.360	0.716	0.0014	0.0037	0.390	0.696
<i>TESG*Female</i>	<-0.0001	<0.0001	-0.570	0.567	<-0.0001	<0.0001	-0.510	0.613	<-0.0001	<0.0001	-0.410	0.683
<i>LN_TA</i>	-0.0027	0.0005	-5.220	<0.001	-0.0027	0.0005	-5.240	0.000	-0.0027	0.0005	-5.220	<0.001
<i>CACL</i>	<0.0001	<0.0001	2.680	0.007	<0.0001	<0.0001	2.680	0.007	<0.0001	<0.0001	2.680	0.007
<i>LEV</i>	0.0003	<0.0001	5.470	<0.001	0.0003	<0.0001	5.470	0.000	0.0003	<0.0001	5.470	<0.001
<i>LOSS</i>	0.0059	0.0020	2.890	0.004	0.0059	0.0020	2.890	0.004	0.0059	0.0020	2.890	0.004
<i>BVMV</i>	-0.0033	0.0015	-2.100	0.036	-0.0033	0.0015	-2.110	0.035	-0.0033	0.0015	-2.100	0.036
<i>PROFIT</i>	0.0005	0.0001	4.060	<0.001	0.0005	0.0001	4.060	0.000	0.0005	0.0001	4.060	<0.001
<i>GROWTH</i>	0.0001	<0.0001	7.500	<0.001	0.0001	<0.0001	7.500	0.000	0.0001	<0.0001	7.500	<0.001
<i>CFO</i>	-0.0714	0.0082	-8.740	<0.001	-0.0714	0.0082	-8.740	0.000	-0.0714	0.0082	-8.740	<0.001
<i>CYCLE</i>	0.0008	0.0008	1.120	0.262	0.0008	0.0008	1.130	0.259	0.0009	0.0008	1.130	0.257
<i>CAPINT</i>	-0.0042	0.0009	-4.810	<0.001	-0.0042	0.0009	-4.800	0.000	-0.0042	0.0009	-4.810	<0.001
<i>PRI_DA</i>	0.2171	0.0108	20.140	<0.001	0.2171	0.0108	20.130	0.000	0.2171	0.0108	20.140	<0.001
<i>AGE</i>	-0.0008	0.0008	-0.910	0.364	-0.0008	0.0008	-0.900	0.368	-0.0008	0.0008	-0.900	0.368

<i>BIG4</i>	-0.0035	0.0019	-1.780	0.075	-0.0035	0.0019	-1.780	0.075	-0.0035	0.0019	-1.790	0.074
<i>YEAR</i>	included				included				included			
Observations	7,964				7,964				7,964			
Adjusted R ²	10.19%				10.19%				10.19%			
F 值	44.03***				44.04***				44.04***			

Please refer to TABLE 1 for variable definitions.