The Relationship Between Board Gender Diversity and Real Earnings Management in U.S. Companies

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Abstract: In the realm of corporate finance, real earnings management (REM) is crucial for maintaining the transparency and integrity of financial reporting. Unlike accrual-based management, REM involves strategic decisions impacting cash flow and operations, drawing significant attention after the Enron scandal and the Sarbanes-Oxley Act. Recently, the importance of board gender diversity in corporate governance has been increasingly recognized. This study explores the relationship between board gender diversity and REM in U.S. public companies from 2021 to 2023. Using data from BoardEx and Compustat, and employing regression analysis, the research examines how gender diversity influences REM, controlling for variables such as company size and industry type. The findings reveal a significant negative correlation between board gender diversity and REM, indicating that more diverse boards tend to adopt transparent and responsible financial reporting strategies. This study underscores the importance of promoting gender diversity in corporate leadership to enhance ethical and transparent financial reporting, providing valuable insights for corporate governance, policymaking, and business practices.

Keywords: Board Gender Diversity, Real Earning Management, Corporate Finance, Corporate Governance.

1. Introduction

Real Earnings Management (REM) is an important factor in corporate finance that helps maintain openness and sustain the integrity of financial reporting. Especially with the enactment of the Sarbanes-Oxley Act, REM has become an extensively utilised approach [1]. Several studies have examined the influence of REM on different accounting factors, including the quality of earnings, requirements for auditing, and the valuation of companies [2 - 4], while others have investigated the factors influencing earnings management [5 - 8]. Gender diversity on boards has received significant scrutiny and analysis during the past decade. Several nations have improved the calibre of their corporate governance by enacting policies that foster gender diversity on corporate boards. Several administrations have increased female representation on boards by reorganising the composition of boards. Gender diversity is widely recognised as a distinctive feature of boards and is believed to improve the efficiency of corporate governance. Prior research has shown that boards with a varied gender makeup are more inclined to be efficient [9].

The study's methodology involves doing a comprehensive analysis of the existing literature on board gender diversity and its influence on profits management. This investigation will encompass

both abstract principles and empirical evidence. The evaluation of board gender diversity will be performed by employing the BoardEx database, which will incorporate data from US public corporations spanning the years 2021 to 2023. The assessment of earnings management (REM) will rely on quantitative measurements using the Compustat database. The study will employ regression analysis to examine the relationship between board gender diversity and REM, while considering pertinent factors such as business size and sector categorisation. The aim of this study is to offer understanding regarding the correlation between a company's board membership and its practices concerning renewable energy management (REM), as well as its overall success. The study explicitly examines the impact of gender diversity. The results of this study have the potential to significantly improve corporate governance procedures, policymaking, and commercial tactics. They can offer useful insights for promoting diversity and inclusivity in business leadership, thereby fostering more ethical and transparent financial reporting.

2.   Literature review

Research has demonstrated that having a diverse range of genders on corporate boards leads to enhanced effectiveness in corporate governance [10, 11]. Research has shown that female directors exhibit superior levels of preparedness and communication abilities compared to their male counterparts [12, 13]. Furthermore, studies indicate that female directors exhibit a greater inclination towards avoiding risks and adhering to ethical standards, leading to a positive influence on practices related to managing earnings [14 - 17]. Empirical data suggests that having a diverse gender representation has a beneficial effect on the autonomy and fairness of decision-making processes, ultimately benefiting both shareholders and stakeholders. Having a substantial number of independent directors on a company's board can successfully prevent any potential opportunistic action by management, while also improving the overall effectiveness of the board's supervisory role [18]. Moreover, the existence of a disparity in gender representation in management can enhance the efficiency of revenue management. The reason for this is that company management teams that have gender equality tend to exhibit a more prudent and careful approach in their financial decisions and other aspects of management [19]. Furthermore, studies suggest that women in leadership positions like CEOs and CFOs are more likely to follow a cautious strategy when it comes to disclosing financial information. They tend to display higher levels of caution and aversion to risk [20].

In summary, this paper propose the following hypothesis:

Hypothesis: There is a negative correlation between board gender diversity and REM.

3.   Methodology

3.1.   Data Source

This study utilises a two-step methodology to retrieve annual financial and accounting data at the firm level from S&P North America Compustat. Additionally, individual-level and firm-level board information is obtained from BoardEx. The BoardEx company identifiers (CompanyID) were connected to Compustat identifiers (GVKEY) provided by WRDS using a linkage table that connects CRSP-Compustat company identifiers (PERMCO and GVKEY) with BoardEx company identifiers (CompanyID), which was generated by WRDS. The BoardEx and Compustat datasets are merged to create an initial sample comprising all American companies from 2021 to 2023. Another constraint of this study was the need to omit companies in the finance sector (SIC 6000-7000) and utilities (SIC 4400-5000) due to variations in accounting and reporting standards, as well as industry legislation. In addition, companies with incomplete data were also removed. There are a total of 1,742 observations of firms throughout the course of a year in the final sample.

3.2. Variables

3.2.1. Interpreted Variable

Real Earnings Management (REM): Building on previous research [21, 22, 23], construct REM requires the following three metrics: Abnormal Cash Flow from Operating Activities (CFO_REM), Abnormal Manipulative Expenses (PROD_REM) and Abnormal Production Costs (DISE_REM).

The following equation is employed to estimate the typical level of discretionary and production costs:

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta Sales_{i,t}}{A_{i,t-1}}\right) + \varepsilon_{i,t} \tag{1}$$

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{Sales_{i,t}}{A_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta Sales_{i,t}}{A_{i,t-1}}\right) + \alpha_4\left(\frac{\Delta Sales_{i,t-1}}{A_{i.t-1}}\right) + \varepsilon_{i,t} \tag{3}$$

$$PROD_{i,t} = COGS_{i,t} + \Delta INV_{i,t} \tag{2}$$

Production cost (PROD) is the sum of the cost of goods sold(COGS) and changes in inventory(ΔINV).

$$\frac{DISE_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_1\left(\frac{Sales_{i,t-1}}{A_{i,t-1}}\right) + \varepsilon_{i,t} \tag{4}$$

To capture the impact of real earnings management as a single metric, this paper defines

$$REM_{i,t} = (CFO\_REM_{i,t} - PROD\_REM_{i,t} + DISEXP\_REM_{i,t})\times(-1) \tag{5}$$

3.2.2. Explanatory variables

The percentage of female directors on a board is a measure of the variety of gender representation on the board. It involves calculating the percentage of female directors. To do this, a dummy or ratio variable that acts as a primary indicator of the presence of female directors must be developed. In order to quantify gender diversity, this study used the percentage of female directors on the board as a proxy variable. The ratio was computed by dividing the total number of board members by the number of female directors.

3.2.3. Control variables

This research examines key financial and governance variables: Tobin's Q assesses market valuation relative to asset replacement, Altman's Z-score predicts bankruptcy risk, ROA measures profitability from efficient use of assets, FSIZE denotes the market size of the firm in terms of logarithmic market capitalisation, LEV captures debt relative to assets or equity, GROWTH tracks growth in sales revenue, BSIZE denotes board size affecting governance dynamics, and INBOD measures board independence from objective and conflict management. BSIZE indicates board size affecting governance dynamics, and INBOD measures the independence of the board in terms of objective decision-making and conflict management.

To increase the likelihood that CEO social capital affects REM and vice versa, this paper lag FeGenRio by one year. Therefore, for Hypothesis 1, this paper constructed the following regression model:

$$REM_t = \alpha + \beta_1 FeGenRio_{i,t} + \beta_2 TobinQ_{i,t} + \beta_3 AltmanZ_{i,t} + \beta_4 ROA_{i,t} + \beta_5 FSIZE_{i,t} + \beta_6 LEV +$$
$$\beta_7 GROWTH_{i,t} + \beta_8 BSIZE_{i,t} + \beta_9 INBOD_{i,t} + \varepsilon_{i,t} \tag{6}$$

where the variables are defined as above.

Table 1 shows the correlation matrix betIen all the independent variables. The results show no serious multicollinearity problems.

Table 1: Correlation Matrix

	REM	FeGenRio	TobinQ	AltmanZ	ROA	SIZE	LEV	GROWTH	BSIZE	INBOD
REM	1									
FeGenRio	-0.118***	1								
TobinQ	-0.248***	0.075***	1							
AltmanZ	-0.205***	0.0250	0.615***	1						
ROA	-0.094***	0.097***	0.046***	0.288***	1					
SIZE	-0.243***	0.348***	0.363***	0.328***	0.467***	1				
LEV	0.0240	-0.089***	0.139***	0.394***	-0.141***	-0.187***	1			
GROWTH	-0.275***	-0.0230	0.069***	0.033**	0.0240	0.065***	-0.070***	1		
BSIZE	-0.149***	0.306***	0.038**	0.041**	0.275***	0.661***	-0.272***	0.0110	1	
INBOD	0.0150	0.066***	-0.00300	-0.0140	0.0200	0.063***	-0.044***	-0.0210	0.063***	1

4. Result and Discussion

4.1. Baseline regression results

According to Table 2, there is a strong negative relationship between gender diversity (FeGenRio_l) and real earnings management (REM). The coefficient of -0.219 reflects the magnitude of this influence, and it is statistically significant at the 1% level. Therefore, a higher representation of female directors on the board is linked to a decrease in the occurrence of earnings management operations. In addition, Tobin's Q (TobinQ) and Return on Assets (ROA) both have notable adverse impacts on REM, with coefficients of -0.0521 and -0.274, respectively. These findings indicate that companies with more market value and profitability are less inclined to participate in REM activities.

The Altman Z-score (AltmanZ) has a modest negative coefficient (-0.00365) and is statistically significant at the 10% level, suggesting a minimal association between financial stress and REM. Additional variables such as firm size (FSIZE), financial leverage (LEV), growth (GROWTH), and board size (BSIZE) do not exhibit a statistically significant influence on REM. In contrast, the proportion of inside directors (INBOD) shows a positive coefficient (0.00752), although it lacks statistical significance. This implies that companies with a higher percentage of internal directors are more likely to participate in earnings manipulation. The R-squared score of 0.207 indicates that the model accounts for 20.7% of the variation in the REM variables. The findings suggest that there is a strong inverse correlation between gender diversity and actual earnings management in the boards of directors in the United States, hence confirming the hypothesis.

Table 2: Baseline regression results

VARIABLES	(1) REM
FeGenRio_l	-0.219***
	(0.0723)
TobinQ	-0.0521***
	(0.00634)
AltmanZ	-0.00365*
	(0.00216)
ROA	-0.274***

Table 2: (continued)

	(0.0575)
FSIZE	-0.00811
	(0.00584)
LEV	0.0689
	(0.0440)
GROWTH	-0.0204
	(0.0183)
BSIZE	-0.00417
	(0.00523)
INBOD	0.00752
	(0.0349)
Observations	1,742
R-squared	0.207

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.2. Robustness test

The robustness test expands the sample from 2021–2023 to 2019–2023. Table 3 shows the coefficient for gender diversity (FeGenRio_l) on real earnings management (REM) decreases from -0.219 to -0.138 but remains significant at the 5% level, indicating a continued, though weaker, impact on reducing REM. The negative effects of Tobin's Q (TobinQ) and Return on Assets (ROA) on REM also lessen but stay highly significant, reinforcing that firms with higher market value and profitability are less likely to engage in REM. The Altman Z-score (AltmanZ) coefficient is smaller and no longer significant, showing a weaker link between financial stress and REM. In the expanded sample, firm size (FSIZE) and board size (BSIZE) negatively impact REM at the 10% significance level, suggesting larger firms and boards may reduce earnings management. Financial leverage (LEV) and growth (GROWTH) remain insignificant. The proportion of inside directors (INBOD) changes from a positive to a negative coefficient, though still not significant, indicating firms with more inside directors are not necessarily more prone to REM. The R-squared value drops from 0.207 to 0.123, implying the model explains less REM variability, likely due to additional unconsidered factors in the larger sample.

Table 3: Robustness test

	(1)
VARIABLES	REM
FeGenRio_l	-0.138**
	-0.138** (0.0616)
TobinQ	-0.0427***
	(0.00419)
AltmanZ	-0.00151
	(0.00155)
ROA	-0.261***
	(0.0443)
FSIZE	-0.00909*
	(0.00501)
LEV	0.0504

Table 3: (continued)

	(0.0385)
GROWTH	0.00793
	(0.00693)
BSIZE	-0.00805*
	(0.00446)
INBOD	-0.00766
	(0.0302)
Observations	4,060
R-squared	0.123

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3. Heterogeneity test

The heterogeneity test results in Table 4 reveal that gender diversity (FeGenRio_l) significantly reduces real earnings management (REM), with a coefficient of -0.761 at the 1% significance level, indicating a strong negative correlation. Board size (BSIZE) also negatively impacts REM with a coefficient of -0.0214 at the 5% significance level, suggesting that larger boards may reduce earnings management. The interaction between gender diversity and board size has a coefficient of 0.0700, significant at the 5% level, indicating that the effect of gender diversity on REM varies with board size. Tobin's Q (Tobin_Q) and Return on Assets (ROA) continue to have significant negative impacts on REM, with coefficients of -0.0520 and -0.272, respectively, consistent with previous findings. The Altman Z-score (Altman_Z) has a negative impact on REM at the 10% significance level, with a coefficient of 0.00374, indicating a weak negative correlation between financial stress and REM. Firm size (FSIZE), financial leverage (LEV), growth (GROWTH), and the proportion of inside directors (INBOD) do not significantly affect REM. The model's R-squared value of 0.209 indicates it explains 20.9% of the variability in REM, similar to previous results, suggesting stable explanatory power.

Table 4: Heterogeneity test

VARIABLES	(1) REM
FeGenRio_l	-0.761***
	(0.237)
BSIZE	-0.0214**
	(0.00889)
c.FeGenRio_l#c.NumberDirectors	0.0700**
	(0.0292)
TobinQ	-0.0520***
	(0.00633)
AltmanZ	-0.00374*
	(0.00216)
ROA	-0.272***
	(0.0575)
FSIZE	-0.00862
	(0.00583)
LEV	0.0712

Table 4: (continued)

	(0.0440)
GROWTH	-0.0214
	(0.0183)
INBOD	0.00776
	(0.0348)
Constant	0.392***
	(0.0945)
Observations	4,060
R-squared	0.123

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

This study looks into the relationship between the usage of real profits management techniques and the gender diversity of company boards in the United States. Data from the BoardEx and Compustat databases are used in the study. The analysis reveals a number of important findings. The habit of altering real earnings is strongly correlated with the diversity of genders on a board. This implies that increasing gender diversity on a board is associated with more accountable and transparent financial reporting procedures. Increasing the number of board members has the potential to reduce profits management behavior; however, the degree of gender diversity on the board may minimize this effect. Moreover, there is a negative correlation between actual earnings management and market value (Tobin's Q) and profitability (ROA), indicating that higher market value and profitability could deter such tactics. Financial pressure, as measured by the Altman Z-score, also shows a negative correlation with real earnings management, though this relationship is relatively weaker. The study found that factors such as company size, financial leverage, growth, and the proportion of inside directors do not significantly impact real earnings management. This indicates that while these variables may theoretically influence earnings management, their effect is less pronounced in empirical analysis compared to other factors. It is, however, important to note that these findings are based on U.S. companies and may not be generalisable to other countries or regions with different regulatory environments, corporate governance practices, or cultural norms regarding gender diversity. Ultimately, this work offers significant and relevant perspectives on how board gender diversity affects corporate financial decision-making and highlights the need of incorporating gender diversity in board composition. These findings have important practical consequences for promoting board arrangements that are more diverse and inclusive.

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