

Article

# Impactful Female Directors and Earnings Management: The Moderating Effect of Ownership Concentration

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**Abstract:** The aim of this study was to examine the moderating effect of ownership concentration (OC) on the relationship between impactful female directors and earnings management (EM). The study concentrated on firms with the lowest positive earnings, measured by return on assets. The results showed that OC positively moderated the association between impactful female directors and accrual earnings management (AEM). With the moderating effect of OC, impactful female directors became positively associated with AEM. In terms of real earnings management (REM), the results showed that OC weakened the significant negative relationship between impactful female directors and REM that was found in the direct regression. With the moderating effect of OC, impactful female directors became insignificantly associated with REM. The study is extremely beneficial to policymakers, stakeholders, researchers, and society. It provides empirical findings that could help all parties to re-evaluate the role of the board of directors, specifically impactful female directors, in mitigating EM. The results highlight the impact of the majority shareholders, introduced by agency theory II, an issue that requires more solutions from regulators.

**Keywords:** board of directors; gender equality; ownership concentration; earnings management



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## 1. Introduction

Investors' confidence in their capacity to make wise selections is affected by the dependability and transparency of financial reports. All users benefit from an honest financial statement that accurately depicts the firm's performance. Management must provide stakeholders with a trustworthy and accurate financial report that helps them in making wise and meaningful decisions. Essentially, each business's main goal is to increase the capital of its shareholders (Gharaibeh and Qader 2017). However, in some cases, managers can manipulate earnings by looking out for their own interests ahead of those of shareholders, as confirmed by agency theory.

Global financial scandals have had a significant impact on international economies and led to the failure of large firms (Al-Absy 2020, 2022a, 2022b). As a result, regulators, investors, and the financial community have become more aware of the necessity to pay closer attention to companies' financial statements (Abdullah and Ismail 2016; Mnif and Cherif 2020). One of the issues that has recently come to the fore is earnings management (EM); many scholars feel that EM procedures are often the primary cause of global financial scandals (Abdullah and Ismail 2016; Al-Absy et al. 2017, 2020a). According to earlier research, EM and fraud have a significant and positive association (Rahman et al. 2016; Sulaiman et al. 2014).

As a result, since the demise of some well-known worldwide companies, corporate governance (CG) has received a great deal of attention, with governments taking action to increase its efficacy (Al-Absy et al. 2020b). The presence of female directors is one of the most significant aspects of CG. Due to the increased significance placed on women's engagement on boards in recent years, there are now more female directors on boards across all nations. However, how gender influences decision-making in the senior management team is still unknown (Kumar and Ravi 2022).

In recent years, the understanding of the importance of board gender diversity has grown (Damak 2018), and it continues to receive significant scholarly attention (Wan Ismail et al. 2022). While it is one of the most researched issues in board governance studies (Weck et al. 2022), there is not much evidence on how having women on the board affects EM (Abdullah and Ismail 2012; Gavius et al. 2012; Mnif and Cherif 2020). Further, existing results are varied (Kyaw et al. 2015), meaning that the issue is still open to question (Abdullah and Ismail 2016; Gull et al. 2018; Lakhali et al. 2015; Mnif and Cherif 2020). Moreover, the majority of the research has been conducted in developed nations (Abdullah and Ismail 2016); additional research is required (Gull et al. 2018).

Therefore, the current study makes a variety of contributions to the body of knowledge. Previous studies have investigated the moderating effect of family ownership on the relationship between female directors and EM in Malaysian firms, e.g., Abdullah and Ismail (2016) and Ismail and Abdullah (2013). However, the current study investigated the moderating effect of ownership concentration (OC) on that relationship. Furthermore, it extends the work of Al-Absy (2022b), which introduced a new concept of gender diversity called impactful women directors and investigated the direct relationship between impactful female directors and EM. According to Weck et al. (2022), there is significant evidence that female directors demonstrate lower work involvement because they are given a lesser standing within the board. Hence, the current study investigates the moderating effect of OC on the relationship between impactful female directors and the level of EM.

The current study expects that OC could affect that relationship. Previous studies, e.g., Kumar and Ravi (2022), have confirmed that the relationship between gender diversity and EM is moderated by other factors, such as the power given to female directors. Further, OC is a significant contextual factor that may have an impact on the degree of information asymmetry, which in turn may alter investment preferences (Ali et al. 2021).

The study aids policymakers in developing countries, where women's contributions appear to be less significant in raising the integrity of financial reports in general, as well as in EM mitigation, to reassess the effect of board gender equality. Further, the study will guide policymakers in evaluating female directors' roles in CG. Hence, the empirical evidence will help policymakers to make decisions in order to strengthen the role of women on the board and its committees, given the existence of high levels of OC.

## 2. Literature Review

### 2.1. Women Directors and Earnings Management

Over the past years, there has been a huge increase in the body of literature studying how gender affects business ethics and risk-taking behavior (Kumar and Ravi 2022). Women on boards are valued more than men (Srinidhi et al. 2011) and are capable of committing more time to oversight (Adams and Ferreira 2009). The appointment of female directors to the board is a positive development since it will improve the effectiveness of the board in managing strategic decisions (Al-Najjar and Salama 2022). Companies with significant gender diversity on their boards perform well in terms of corporate sustainability (Kamarudin et al. 2022). Further, gender-diverse boards are more likely to be autonomous (Böhren and Staubo 2016). The accuracy of analysts' forecasts is greater for companies with more gender diversity on the board (Wan Ismail et al. 2023).

According to agency theory, board gender diversity is one mechanism that helps to resolve the conflict of interest between management and shareholders. Furthermore, based on the resource dependence hypothesis, board composition is a tactical tool that aids in bringing in outside resources, which will increase the company's growth. Therefore, the expectations and pressures of the environment have an impact on the board's makeup (Boyd 1990). Over the last ten years, society has increased the pressure on boards to appoint female directors (Lückerath-Rovers 2009), as research shows that female directors on corporate boards play an important role in the success of the organization.

The studies of Abdullah et al. (2016) and Adams and Ferreira (2009) found that female directors are significantly associated with higher firm performance. Similarly, Carter

*et al.* (2003) found that female directors are significantly associated with higher firm value. *Srinidhi et al.* (2011) found that female directors are significantly associated with higher earnings quality. On the other hand, other studies have found the opposite effect of female directors on firm performance. According to certain research, including *Abdullah* (2014) and *Abdullah et al.* (2016), which used Tobin's Q as a proxy, having women on the board is significantly linked to lower business performance.

The results of previous studies examining the influence of women on the board on EM are mixed. Some research has found a significant negative association between women on the board and EM in developed countries (*Gavious et al.* 2012; *Gull et al.* 2018; *Kyaw et al.* 2015; *Lakhal et al.* 2015); the same association has also been demonstrated in Malaysia (*Ku Ismail and Abdullah* 2013). This result is in line with the ideas of agency and resource-dependence theories. However, the results of other studies have contradicted the agency and resource reliance ideas, finding a substantial positive correlation between having women on the board and EM both in developed nations (*Arun et al.* 2015) and in Malaysia (*Buniamin et al.* 2012). Other studies, conducted in Malaysia (*Abdullah and Ismail* 2012, 2016) and other developing nations (*Moradi et al.* 2012), have discovered no connection between having women on the board and EM. According to *Yusoff et al.* (2013), these conflicting outcomes may be caused by the low representation of women on corporate boards in developing nations such as Malaysia, which weakens their voices (*Abdullah and Ismail* 2012).

Regarding the structure of the audit committee (AC), it is asserted that the representation of female directors on the AC may strengthen the AC's monitoring function in EM mitigation and, hence, improve the financial reporting quality. For example, some studies conducted in developed countries have found a significant negative relationship between women on the AC and EM, with the same results also found in some studies in the Malaysian context, consistent with agency and resource-dependence theories (*Gavious et al.* 2012; *Ku Ismail and Abdullah* 2013; *Salleh et al.* 2012; *Thiruvadi and Huang* 2011; *Zalata et al.* 2018). However, other studies conducted in developed countries and in Malaysia (*Abdullah and Ismail* 2012, 2016; *Salleh and Haat* 2013; *Sun et al.* 2011) did not uncover a relationship between women on the AC and EM.

## 2.2. Ownership Concentration and Earnings Management

The type I agency problem (principal-agent) shifts to a type II agency problem (minority-majority shareholders) due to concentrated/controlling ownership. When concentrated/controlling ownership power is not moderated by independent directors, the agency problem is heightened (*Anderson and Reeb* 2004) as the majority of shareholders equally control and manage these firms (*Leung et al.* 2014). Thus, management with a family influence make decisions for their own interests (*Lane et al.* 2006). This is especially so when board directors have incentives to be friendly to managers or majority shareholders (*Staubo* 2010).

As a result, controlling owners who want to avoid pressure or criticism from non-controlling shareholders or other external monitoring systems have the incentive to use EM (*Bao and Lewellyn* 2017; *Chi et al.* 2015; *Razzaque et al.* 2016), especially where there is an increase in the information asymmetry problem, where information is held only by managers or controlling shareholders (*Jensen and Meckling* 1976).

Ownership structure plays an essential role in structuring CG mechanisms in all countries. OC has a dual impact on agency issues; it can either lessen or increase them. Although it worsens the principal-principal agency problem, it lessens the principal-agent agency problem (*Ali et al.* 2021). For instance, a high concentration of ownership could be an effective driver and monitoring tool for management activities and for reducing the agency problem (*Darko et al.* 2016). Previous studies have found a significantly negative relationship between concentrated ownership and EM (*Alves* 2012; *Geraldes-Alves* 2011).

However, other scholars have argued that concentrated ownership could dominate managers' decisions, by leveraging corporate resources to owners' advantage at the expense

of minority shareholders. Some previous studies have found a significantly positive relationship between concentrated ownership and EM (Abdullah and Nasir 2004; Al-Rassas and Kamardin 2015, 2016; Choi et al. 2004; Gavius et al. 2012; Gulzar 2011). Meanwhile, other studies have found no relationship (Abdul-Rahman and Ali 2006; Amer and Abdelkarim 2010; Chekili 2012; Mohammad et al. 2016).

Previous research has found mixed results on the influence of women on the board on constraining EM. In developed countries, the relationship seems to be negative and significant, while in developing countries, the relationship seems to be insignificant. It appears that the relationship between women on the board and EM is moderated by the type of ownership, where the firms' shares tend to be diffusely held in developed countries while they are often held tightly by families in Asian countries (Claessens and Fan 2002).

Many countries throughout the world have passed gender quota legislation that requires the nomination of female directors in order to promote corporate governance in the boardroom (Wan Ismail et al. 2022). In Malaysia, where this study was conducted, the code of corporate governance mandates large companies to have at least 30% female directors. In alignment with the agency and resource-dependence theories, several studies have found that women on the AC play an important role in enhancing the monitoring role of the AC toward mitigating the practice of EM. However, some studies conflict with the above theories. Majority owners often dominate the decisions of the firm as they play an active role in CG (Hasan et al. 2014; Shleifer and Vishny 1997). Female directors are more likely to be appointed due to family affiliations than for any other reasons (Abdullah 2014; Ku Ismail and Abdullah 2013). This reflects that family affiliation has a strong influence on the appointment of female directors.

Ku Ismail and Abdullah (2013) found that family ownership positively moderates the relationship between female directors on the AC and the level of EM practice. However, a subsequent extended study by Abdullah and Ismail (2016) contradicted this finding. By following the previous studies and in line with the type II agency problem, the current study expects that OC will positively moderate the effect of impactful female directors on constraining the level of EM. Hence, the following hypotheses were formulated:

**H<sub>1</sub>:** *Ownership concentration positively moderates the relationship between impactful female directors and accrual earnings management (AEM).*

**H<sub>2</sub>:** *Ownership concentration positively moderates the relationship between impactful female directors and real earnings management (REM).*

### 3. Research Design

#### 3.1. Sample Selection

This study's population consisted of all public firms that were listed, and financial data were available on the Bursa Malaysia Main Market for three years (2013, 2014, and 2015). However, following the previous studies of Roychowdhury (2006) and Yuliana et al. (2015), the study covered only the firms with the lowest positive earnings measured by ROA. It is argued that EM may be more prevalent in firms with near-zero earnings because managers wish to avoid minor losses (pre-managed earnings) by converting them into small gains (Roychowdhury 2006; Ugrin et al. 2017; Yuliana et al. 2015). First, 54 firms (closed-end funds, special purpose acquisition companies, real estate investment trusts, and firms in the financial services industry) were dropped from this study, along with any firms for which there were no available ROA data (79 firms). After excluding the firms with negative earnings in one or more of the years, the average ROA over three years (2013 to 2015) was calculated for the remaining 675 firms. In the end, the study selected the 300 firms with the lowest positive earnings after the averages were sorted in ascending order (Al-Absy et al. 2018, 2019a, 2019b, 2021; Al-Absy 2020). A further 12 firms were eliminated due to incomplete data and because they were in industries with less than six observations as the required number of EM calculations (Subramanyam 1996). As a result, the final sample included 288 firms over three years (864 company observations).

### 3.2. Earnings Management Measurement

Two measurements of EM were used in this study: (i) The Jones Model, introduced by Jones (1991), as a proxy for AEM, and (ii) abnormal levels of cash flow from operations (ABCFO), introduced by Roychowdhury (2006), as a proxy for REM. In order to calculate these proxies, OLS regression was used for three years to obtain the coefficient value of  $\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$ , and  $\varepsilon_{it}$ .

$$\frac{TA_{it}}{A_{it-1}} = \alpha_1 \left( \frac{1}{A_{it-1}} \right) + \alpha_2 \left( \frac{\Delta REV_{it}}{A_{it-1}} \right) + \alpha_3 \left( \frac{PPE_{it}}{A_{it-1}} \right) + \varepsilon_{it} \quad (1)$$

TA is the total accruals,  $A_{it-1}$  is last year's total assets,  $\Delta REV$  is the change in revenue, PPE is the gross property, plant, and equipment, and  $\varepsilon_{it}$  is an error term. These coefficient values were used in Equation (2) to calculate the nondiscretionary accruals (NDA).

$$NDA = \alpha_1 \left( \frac{1}{A_{it-1}} \right) + \alpha_2 \left( \frac{\Delta REV_{it}}{A_{it-1}} \right) + \alpha_3 \left( \frac{PPE_{it}}{A_{it-1}} \right) + \varepsilon_{it} \quad (2)$$

Next, Equation (3) was used to determine the level of discretionary accruals (DA). This value could either decrease income (negative values) or increase income (positive values). This study, however, looked only at values that had been managed. As a result, this study estimated AEM using absolute values of DA (Abdullah and Ismail 2016; Mohammad et al. 2016).

$$DA = \frac{TA_{it}}{A_{it-1}} - NDA \quad (3)$$

Regarding ABCFO, OLS regression was used to obtain the coefficient values  $\alpha_1$ ,  $\beta_1$ , and  $\beta_2$ . CFO<sub>it</sub> reflects the amount of cash flow from operations, while  $A_{it-1}$  is the value of last year's total assets.  $S_t$  is the value of sales and  $\Delta S_{it}$  is the change in sales.

$$\frac{CFO_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \left( \frac{1}{A_{it-1}} \right) + \beta_1 \left( \frac{S_{it}}{A_{it-1}} \right) + \beta_2 \left( \frac{\Delta S_{it}}{A_{it-1}} \right) + \varepsilon_{it} \quad (4)$$

The coefficients of  $\alpha_1$ ,  $\beta_1$ , and  $\beta_2$  were used in the following equation to obtain the normal levels of operational cash flow (NCFO).

$$NCFO = \alpha_0 + \alpha_1 \left( \frac{1}{A_{it-1}} \right) + \beta_1 \left( \frac{S_{it}}{A_{it-1}} \right) + \beta_2 \left( \frac{\Delta S_{it}}{A_{it-1}} \right) + \varepsilon_{it} \quad (5)$$

Then, by deducting NCFO from the actual cash flow from activities, ABCFO was determined as follows:

$$ABCFO = \frac{CFO_{it}}{A_{it-1}} - NCFO \quad (6)$$

The absolute value of ABCFO was employed in this study to represent the amount of REM (Al-Absy 2022b; Kwon et al. 2017; Liu and Wang 2017).

### 3.3. Empirical Model

The aim of this study was to examine the moderating effect of OC on the relationship between impactful female directors and EM, AEM, and REM. Before examining Hypothesis 1 (relating to AEM), the following direct regression was run:

$$AEM = \beta_0 + \beta_1 IFD + \beta_2 BIND + \beta_3 BSIZE + \beta_4 BMEET + \beta_5 ACIND + \beta_6 ACSIZE + \beta_7 ACMEET + \beta_8 ACAE + \beta_9 OC + \beta_{10} BIG4 + \beta_{11} FSIZE + \beta_{12} LEV + \beta_{13} ROA + \beta_{14} NCFO + \varepsilon \quad (\text{Model 1})$$

Then, the following regression was run to examine the moderating effect of OC on the relationship between impactful female directors and EM using AEM:

$$AEM = \beta_0 + \beta_1 IFD + \beta_2 OC + \beta_3 IFD * OC + \beta_4 BIND + \beta_5 BSIZE + \beta_6 BMEET + \beta_7 ACIND + \beta_8 ACSIZE + \beta_9 ACMEET + \beta_{10} ACAE + \beta_{11} BIG4 + \beta_{12} FSIZE + \beta_{13} LEV + \beta_{14} ROA + \beta_{15} NCFO + \varepsilon \quad (\text{Model 2})$$

To examine Hypothesis 2 (relating to REM), the study first ran the following direct regression:

$$\text{REM} = \beta_0 + \beta_1\text{IFD} + \beta_2\text{BIND} + \beta_3\text{BSIZE} + \beta_4\text{BMEET} + \beta_5\text{ACIND} + \beta_6\text{ACSIZE} + \beta_7\text{ACMEET} + \beta_8\text{ACAE} + \beta_9\text{OC} + \beta_{10}\text{BIG4} + \beta_{11}\text{FSIZE} + \beta_{12}\text{LEV} + \beta_{13}\text{ROA} + \beta_{14}\text{NCFO} + \varepsilon \quad (\text{Model 3})$$

Then, the following regression was run to examine the moderating effect of OC on the relationship between impactful female directors and EM using REM:

$$\text{REM} = \beta_0 + \beta_1\text{IFD} + \beta_2\text{OC} + \beta_3\text{IFD} * \text{OC} + \beta_4\text{BIND} + \beta_5\text{BSIZE} + \beta_6\text{BMEET} + \beta_7\text{ACIND} + \beta_8\text{ACSIZE} + \beta_9\text{ACMEET} + \beta_{10}\text{ACAE} + \beta_{11}\text{BIG4} + \beta_{12}\text{FSIZE} + \beta_{13}\text{LEV} + \beta_{14}\text{ROA} + \beta_{15}\text{NCFO} + \varepsilon \quad (\text{Model 4})$$

The study used two measurements of impactful female directors (IFD) with each of the above models run separately for each measurement. The first was IFD1:1. If the board contained at least one female director who also sat on the AC, it was scored 1; if not, it was scored 0. The second was IFD2:1, scored as 1 if the board had at least two female directors, at least one of whom was a member of the AC, or 0 if not.

This study included several control variables in order to reduce the likelihood of endogeneity and error in generating the models, as suggested by [Prencipe and Bar-Yosef \(2011\)](#). Importantly, the study included several variables relevant to CG and others related to company-specific features, all of which were incorporated into the regressions to control the relationship. Table 1 displays the measurement explanation for all variables.

**Table 1.** Variables' operationalization.

Acronym	Measurement and Resource
AEM	DA (Absolute value) using Jones Model.
ABCFO	Abnormal levels of cash flow from operations (Absolute value), presented by <a href="#">Roychowdhury (2006)</a> .
IFD1:1	"1" if the board has at least one female director who also serves in AC, and "0" if not
IFD2:1	"1" if the board has at least two female directors and one of them is serving in AC, and "0" if not
OC	% Of shares owned by the top five shareholders.
BSIZE	Number of board directors.
BIND	% Of independent directors on the board.
BMEET	Number of board meetings held per year.
ACSIZE	Number of AC's directors.
ACIND	% Of independent directors in AC
ACMEET	Number of AC meetings held per year.
ACAE	% Of AC's accounting expertise
BIG4	"1" if the annual report has been audited by a Big4 firm, 0 otherwise.
LEV	Total debt/total assets.
FSIZE	Total assets' natural log value.
NCFO	"1" if cash flow from operations is negative, and "0", if otherwise
ROA	Net income/total assets.

## 4. Results and Discussion

### 4.1. Descriptive Statistics

Table 2 displays the descriptive statistical information of the variables. The Jones Model and the ABCFO had mean absolute values of 0.048 and 0.050, respectively. Further, 94 (10.88%) of the observations had at least two female directors, at least one of whom sat on the AC, while 220 (25.46%) of the observations had at least one female director on the board who also served on the AC. In terms of OC, the top five shareholders possessed, on average, 54.60 percent of the shares.

**Table 2.** Descriptive statistics.

A. Continuous Variables					
Variables	Mean	Min.	Max.	Skewness	Kurtosis
AEM	0.048	0.001	0.216	1.57	5.40
ABCFO	0.050	0.001	0.226	1.58	5.66
OC	0.546	0.141	0.948	−0.08	2.32
BIND	0.474	0.222	1	0.70	3.33
BSIZE	7.418	4	17	0.98	4.84
BMEET	5.459	3	10	1.46	4.66
ACIND	0.900	0.667	1	−0.81	1.73
ACSIZE	3.244	3	6	2.17	8.19
ACMEET	5.039	3	10	1.84	7.79
ACAE	0.429	0	1	1.11	4.10
FSIZE (lnAsset)	13.485	10.098	18.579	0.80	3.50
LEV (%)	20.775	0.000	68.560	0.42	2.48
ROA (%)	4.412	0.010	15.160	0.66	3.57
B. Dummy Variables					
Variables	Yes (1)		No		
	Freq.	%	Freq.	%	
IFD1:1	220	25.5	644	74.5	
IFD2:1	94	10.9	770	89.1	
NCFO	198	22.9	666	77.1	
BIG4	459	53.1	405	46.9	

#### 4.2. Diagnostic Tests

The study used several statistical assumptions. Extreme observations occurred in the data for AEM, ABCFO, and ACMEET. Hence, to remove the issue of outliers, the study winsorized the data of these variables, using the bottom and top 1%. Similarly, the study winsorized the data of BMEET, using the bottom and top 5%. Regarding the normality, a test of skewness and kurtosis was employed, which demonstrated no substantial violation in the dataset of individual variables as the value of kurtosis was between  $\pm 10$  and skewness was between  $\pm 3$  (see Table 2). Furthermore, Pearson's correlation was employed in the study to test multicollinearity. Based on Table 3, the correlation values among variables did not exceed  $\pm 0.80$ . This suggests there is no evidence of serious multicollinearity issues.

In terms of heteroscedasticity, the Breusch–Pagan/Cook–Weisberg test confirmed the existence of heteroscedasticity issues, meaning that the option “panels (heteroscedastic)” was inserted in the regression to address this issue (see, Podestà 2002; StataCorp 2015). In terms of the autocorrelation issue, the Durbin–Watson test was used and showed no issue of autocorrelation. As a result, the feasible generalized least squares (FGLS) regression was used.

#### 4.3. Regression Results and Discussion

Table 4 shows the results of testing hypothesis 1 related to AEM. There was a significant negative association between impactful female directors and the level of AEM (see model 1 in column 1). This means that having at least one woman on the board who also served on the AC had a significant negative relationship with AEM. The result indicates that when women are appointed to the board and to the AC, the level of accrual earnings manipulation is significantly reduced. This result is consistent with agency and resource-dependence theories, which suggest that gender equality enhances the role of the board of directors in monitoring and supervising the managers. Further, it is in line with previous studies (Gavious et al. 2012; Gull et al. 2018; Kyaw et al. 2015; Lakhali et al. 2015), which found that female directors reduced the practice of AEM.

**Table 3.** Pearson correlation analysis.

Variables	AEM	ABCFO	IFD1:1	IFD2:1	BIND	BSIZE	BMEET	ACIND	
AEM	1								
ABCFO	0.771 ***	1							
IFD1:1	−0.059 *	−0.062 *	1						
IFD2:1	−0.056 *	−0.068 **	0.598 ***	1					
BIND	0.055	0.026	−0.053	−0.014	1				
BSIZE	−0.082 **	−0.048	0.075 **	0.116 ***	−0.322 ***	1			
BMEET	0.050	0.010	0.113 ***	0.066 **	0.066 **	0.200 ***	1		
ACIND	0.092 ***	0.072 **	−0.136 ***	−0.009	0.408 ***	0.098 ***	0.271 ***	1	
ACSIZE	−0.067 **	−0.058 *	0.076 **	0.082 **	0.201 ***	0.306 ***	−0.080 **		1
ACMEET	−0.003	−0.043	0.087 **	0.040	0.036	0.142 ***	0.586 ***		0.005
ACAE	0.042	0.061 *	0.020	0.026	−0.038	−0.026	−0.016		0.073 **
OC	−0.055	−0.019	0.112 ***	0.031	−0.089 ***	0.048	0.145 ***		−0.125 ***
BIG4	−0.075 **	−0.092 ***	0.144 ***	0.105 ***	0.037	0.122 ***	0.155 ***		−0.080 **
FSIZE	−0.113 ***	−0.121 ***	0.105 ***	0.132 ***	−0.017	0.363 ***	0.349 ***		−0.126 ***
LEV	0.054	−0.004	−0.130 ***	−0.013	−0.111 ***	0.141 ***	0.080 **		0.035
ROA	0.051	0.112 ***	−0.015	−0.028	−0.058 *	0.082 *	0.004		−0.057 *
NCFO	0.317 ***	0.358 ***	−0.028	−0.040	0.018	−0.055	0.041		0.123 ***
Variables	ACSIZE	ACMEET	ACAE	OC	BIG4	LFSIZE	LEV	ROA	NCFO
AEM									
ABCFO									
IFD1:1									
IFD2:1									
BIND									
BSIZE									
BMEET									
ACIND									
ACSIZE	1								
ACMEET	0.136 ***	1							
ACAE	−0.146 ***	0.020	1						
OC	0.086 **	0.071 **	−0.010	1					
BIG4	0.203 ***	0.109 ***	0.035	0.093 ***	1				
FSIZE	0.273 ***	0.299 ***	−0.024	0.094 ***	0.468 ***	1			
LEV	−0.009	0.128 ***	0.000	−0.081 **	0.126 ***	0.343 ***	1		
ROA	−0.002	−0.049	0.011	0.002	0.021	0.045	−0.096 ***	1	
NCFO	−0.035	−0.012	0.030	−0.082 **	−0.122 ***	−0.112 ***	0.124 ***	−0.082 **	1

Definitions of the acronym are presented in Table 1. \*, \*\*, and \*\*\* are significant at 10%, 5%, and 1% levels, respectively.

In terms of the moderating effect of OC, model 2 in column 1 shows that OC positively moderated the relationship between impactful female directors and AEM. With the moderating effect of OC, the relationship between impactful female directors and AEM became significantly positive, instead of the significant negative direct relationship. This means that a high percentage of shareholders with a significant share influences the role of female directors in mitigating the practice of AEM. This result is consistent with agency theory II, which expects a conflict of interest between majority and minority shareholders. Majority shareholders may have power or influence in the director recruitment process and may appoint female directors with whom they have a family or friendship relationship or who are loyal to them, instead of selecting the most qualified female directors.

Regarding the second measurement of impactful female directors (two or more female directors, at least one of whom also serves on the AC), the results showed a significant negative relationship between impactful female directors and AEM (see model 1 in column 2). Two or more female directors, at least one of whom was on the AC, could strengthen their power on the board and hence reduce AEM. In terms of the moderating effect of OC, model 2 in column 2 shows that OC weakened the relationship between impactful female directors and AEM. Within the moderation of OC, the relationship between impactful fe-



male directors and AEM became insignificantly positive instead of the significant negative relationship found in the direct regression.

**Table 4.** Regression result of the AEM using FGLS.

Variables	Column 1		Column 2	
	Model 1	Model 2	Model 1	Model 2
IFD1:1	−0.00355 ** (0.00165)	−0.0211 *** (0.00635)		
IFD1:1 × OC		0.0303 *** (0.0108)		
IFD2:1			−0.00517 *** (0.00200)	−0.0166 ** (0.00692)
IFD2:1 × OC				0.0194 (0.0121)
OC	−0.00496 (0.00469)	−0.0151 ** (0.00629)	−0.00692 (0.00485)	−0.00971 * (0.00569)
BIND	0.00747 (0.00880)	0.00794 (0.00900)	0.00670 (0.00873)	0.00878 (0.00916)
BFSIZE	−0.000505 (0.000480)	−0.000389 (0.000485)	−0.000425 (0.000477)	−0.000258 (0.000492)
BMEET	0.00322 *** (0.000553)	0.00327 *** (0.000563)	0.00327 *** (0.000531)	0.00309 *** (0.000568)
ACIND	0.0132 ** (0.00603)	0.0138 ** (0.00613)	0.0161 *** (0.00591)	0.0138 ** (0.00604)
ACSIZE	−0.00358 ** (0.00149)	−0.00464 *** (0.00153)	−0.00334 ** (0.00146)	−0.00417 *** (0.00156)
ACMEET	−0.00131 * (0.000669)	−0.00138 ** (0.000689)	−0.00137 ** (0.000652)	−0.00123 * (0.000690)
ACEXP	0.0123 *** (0.00288)	0.0146 *** (0.00320)	0.0123 *** (0.00293)	0.0124 *** (0.00305)
Big4	−0.00167 (0.00162)	−0.000861 (0.00165)	−0.00128 (0.00162)	−0.000725 (0.00166)
LFSIZE	−0.00204 *** (0.000430)	−0.00203 *** (0.000423)	−0.00214 *** (0.000402)	−0.00226 *** (0.000412)
LEV	0.000157 *** (0.000058)	0.000147 ** (0.0000579)	0.000180 *** (0.0000523)	0.000176 *** (0.000053)
ROA	0.00175 *** (0.000327)	0.00172 *** (0.000331)	0.00176 *** (0.000329)	0.00169 *** (0.000337)
NEGCFO	0.0274 *** (0.00223)	0.0276 *** (0.00232)	0.0275 *** (0.00223)	0.0276 *** (0.00236)
Constant	0.0404 *** (0.00853)	0.0465 *** (0.00867)	0.0382 *** (0.00849)	0.0440 *** (0.00870)
Wald chi2	421.69	388.82	478.31	372.14
Sig	0.0000	0.0000	0.0000	0.0000
R-squared	0.1308	0.1324	0.1307	0.1319
Observations	864	864	864	864
Number of ID	288	288	288	288

Variables were defined in Table 1. Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 5 shows the results of testing hypothesis 2 relating to REM. There was a significant negative association between impactful female directors and the level of real earnings manipulation (see model 3 in column 1). This means that having at least one woman on the board who was also serving on the AC significantly reduced real earnings manipulation. In terms of the moderating effect of OC, model 4 in column 1 shows that OC weakened the role of impactful female directors in mitigating real earnings manipulation. With the moderation of OC, the relationship between impactful female directors and REM became insignificantly negative instead of the significant negative relationship found in the direct regression.

**Table 5.** Regression result of the REM using FGLS.

Variables	Column 1		Column 2	
	Model 3	Model 4	Model 3	Model 4
IFD1:1	−0.00612 *** (0.00151)	−0.00394 (0.00509)		
IFD1:1 × OC		−0.00435 (0.00946)		
IFD2:1			−0.00640 *** (0.00239)	−0.00331 (0.00697)
IFD2:1 × OC				−0.00696 (0.0123)
OC	0.000714 (0.00410)	0.00216 (0.00530)	0.00293 (0.00422)	0.00332 (0.00455)
BIND	−0.00115 (0.00861)	−0.000956 (0.00863)	0.00421 (0.00872)	0.00390 (0.00869)
BSIZE	−0.000254 (0.000457)	−0.000196 (0.000473)	0.000230 (0.000507)	0.000257 (0.000504)
BMEET	0.00156 *** (0.000504)	0.00155 *** (0.000511)	0.00104 * (0.000592)	0.00108 * (0.000585)
ACIND	0.00646 (0.00640)	0.00587 (0.00656)	0.00682 (0.00650)	0.00707 (0.00647)
ACSIZE	−0.00153 (0.00153)	−0.00146 (0.00153)	−0.00113 (0.00160)	−0.00111 (0.00161)
ACMEET	−0.000270 (0.000630)	−0.000289 (0.000635)	−0.000339 (0.000686)	−0.000347 (0.000677)
ACEXP	0.0156 *** (0.00333)	0.0153 *** (0.00345)	0.0159 *** (0.00334)	0.0156 *** (0.00340)
Big4	−0.00120 (0.00154)	−0.00118 (0.00154)	−0.00119 (0.00154)	−0.00115 (0.00154)
LFSIZE	−0.00148 *** (0.000474)	−0.00154 *** (0.000489)	−0.00173 *** (0.000488)	−0.00177 *** (0.000480)
LEV	−0.000105 * (0.000054)	−0.000102 * (0.0000553)	−0.000078 (0.0000553)	−0.0000799 (0.0000554)
ROA	0.00261 *** (0.000281)	0.00262 *** (0.000283)	0.00270 *** (0.000288)	0.00271 *** (0.000290)
NEGCF0	0.0374 *** (0.00193)	0.0376 *** (0.00194)	0.0380 *** (0.00195)	0.0381 *** (0.00193)
Constant	0.0364 *** (0.00751)	0.0364 *** (0.00750)	0.0320 *** (0.00745)	0.0319 *** (0.00743)
Wald chi2	737.25	728.86	580.05	606.21
Sig	0.0000	0.0000	0.0000	0.0000
R-squared	0.1639	0.1639	0.1637	0.1640
Observations	864	864	864	864
Number of ID	288	288	288	288

Variables were defined in Table 1. Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*  $p < 0.1$ .

Regarding the second measurement of impactful female directors (two or more female directors, with at least one of those on the AC), the results showed a significant negative relationship between impactful female directors and REM (see model 3 in column 2). Two or more female directors, with at least one of those on the AC, could strengthen their power on the board and hence reduce REM. In terms of the moderating effect of OC, model 4 in column 2 shows that OC weakened the relationship between impactful female directors and REM. With the moderation of OC, the relationship between impactful female directors and REM became insignificantly negative, instead of the significant negative relationship found in the direct regression.

### 5. Robustness Tests

It has been discovered that the business cycle, as well as disparities between industries, can have an impact on results (Baatwah et al. 2015). For this reason, all regressions were re-estimated utilizing a dummy variable to reflect the effects of the years and the industry. The findings displayed in Table 6 are similar to those shown in Table 4 related to AEM and Table 5 related to REM.

**Table 6.** Regression results of the AEM and REM using FGLS and including year and industry dummy variables.

Variables	AEM				REM			
	Column 1		Column 2		Column 1		Column 2	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
IFD1:1	−0.00330 *	−0.0216 ***			−0.00631 ***	−0.00602		
IFD1:1 × OC	(0.00169)	(0.00648)			(0.00161)	(0.00554)		
IFD2:1		0.0314 ***	−0.00431 **	−0.0180 **		−0.000649	−0.00633 ***	−0.00432
IFD2:1 × OC		(0.0109)	(0.00202)	(0.00707)		(0.0101)	(0.00236)	(0.00690)
OC	−0.00409	−0.0142 **	−0.00553	−0.00840	0.00154	0.00164	0.00291	0.00289
BIND	(0.00490)	(0.00644)	(0.00503)	(0.00575)	(0.00422)	(0.00542)	(0.00431)	(0.00472)
BFSIZE	0.00557	0.00643	0.00640	0.00722	−0.00110	−0.00110	0.00286	0.00261
BMEET	(0.00893)	(0.00903)	(0.00885)	(0.00917)	(0.00893)	(0.00896)	(0.00905)	(0.00903)
ACIND	−0.000286	−0.000216	−0.000226	−0.0000668	−0.000143	−0.000136	0.000218	0.000236
ACSIZE	(0.000494)	(0.000496)	(0.000495)	(0.000505)	(0.000480)	(0.000490)	(0.000518)	(0.000516)
ACMEET	0.00339 ***	0.00348 ***	0.00330 ***	0.00329 ***	0.00145 **	0.00145 **	0.00104 *	0.00109 *
ACEXP	(0.000567)	(0.000563)	(0.000562)	(0.000581)	(0.000595)	(0.000600)	(0.000623)	(0.000620)
Big4	0.0137 **	0.0147 **	0.0166 ***	0.0145 **	0.00495	0.00493	0.00602	0.00640
LFSIZE	(0.00617)	(0.00628)	(0.00610)	(0.00621)	(0.00652)	(0.00670)	(0.00659)	(0.00659)
LEV	−0.00375 ***	−0.00465 ***	−0.00350 **	−0.00422 ***	−0.00146	−0.00145	−0.000991	−0.00102
ROA	(0.00144)	(0.00146)	(0.00143)	(0.00149)	(0.00155)	(0.00155)	(0.00161)	(0.00162)
NEGCF0	−0.00116	−0.00130 *	−0.00128 *	−0.00121	−0.000199	−0.000201	−0.000271	−0.000301
Constant	(0.000738)	(0.000747)	(0.000735)	(0.000753)	(0.000696)	(0.000696)	(0.000724)	(0.000720)
Year dummy	0.0105 ***	0.0127 ***	0.0102 ***	0.0105 ***	0.0150 ***	0.0150 ***	0.0155 ***	0.0154 ***
Industry dummy	(0.00319)	(0.00343)	(0.00325)	(0.00334)	(0.00343)	(0.00355)	(0.00347)	(0.00352)
Wald chi2	−0.000913	−0.0000289	−0.000556	−0.000132	−0.00131	−0.00133	−0.00162	−0.00169
Sig	(0.00171)	(0.00173)	(0.00174)	(0.00176)	(0.00163)	(0.00164)	(0.00164)	(0.00164)
R-squared	−0.00232 ***	−0.00232 ***	−0.00248 ***	−0.00262 ***	−0.00145 ***	−0.00145 ***	−0.00157 ***	−0.00156 ***
Observations	(0.000479)	(0.000484)	(0.000489)	(0.000494)	(0.000513)	(0.000525)	(0.000522)	(0.000523)
Number of ID	0.000148 **	0.000144 **	0.000182 ***	0.000178 ***	−0.000107 *	−0.000107 *	−0.0000819	−0.0000822
	(0.0000589)	(0.0000587)	(0.0000552)	(0.0000553)	(0.000055)	(0.0000554)	(0.0000551)	(0.0000552)
	0.00163 ***	0.00156 ***	0.00171 ***	0.00158 **	0.00252 **	0.00253 **	0.00264 **	0.00266 **
	(0.000333)	(0.000336)	(0.000337)	(0.000341)	(0.000298)	(0.000303)	(0.000298)	(0.000301)
	0.0275 ***	0.0276 ***	0.0275 ***	0.0278 ***	0.0373 ***	0.0373 ***	0.0379 ***	0.0379 ***
	(0.00235)	(0.00241)	(0.00235)	(0.00244)	(0.00198)	(0.00199)	(0.00198)	(0.00198)
	0.0411 ***	0.0470 ***	0.0396 ***	0.0456 ***	0.0374 ***	0.0372 ***	0.0316 ***	0.0310 ***
	(0.00881)	(0.00888)	(0.00891)	(0.00899)	(0.00792)	(0.00793)	(0.00774)	(0.00777)
	Included	Included	Included	Included	Included	Included	Included	Included
	Included	Included	Included	Included	Included	Included	Included	Included
Wald chi2	419.80	417.31	455.01	390.24	563.76	562.69	539.45	542.05
Sig	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R-squared	0.1338	0.1355	0.1337	0.1350	0.1671	0.1671	0.1669	0.1672
Observations	864	864	864	864	864	864	864	864
Number of ID	288	288	288	288	288	288	288	288

Variables were defined in Table 1. Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

### 6. Conclusions

To improve financial reporting and lower EM, the board of directors is essential. One of the most important CG tools is gender diversity, and many regulators have a policy requiring female board presence; corporations are required by law to have at least a specific proportion of women on their boards. The argument over how female directors affect corporate performance and financial reporting quality persists even though there are increasing numbers of female directors on boards globally. Hence, the aim of this study was to examine the moderating effect of OC on the relationship between impactful female directors and EM.

When we examined the direct relationship between impactful female directors and AEM, the result was a significant negative association, which means that impactful female directors significantly reduced the practice of AEM, as suggested by agency and resource-dependence theories. In terms of the moderating effect of OC, the results showed that OC positively moderated the relationship between impactful female directors and AEM; with the moderating effect of OC, impactful female directors became significantly positively associated with AEM. This means that having at least one woman on the board also serving on the AC could result in increasing the practice of AEM, which reflects a strong influence of OC on the role of female directors. These results are consistent with agency theory II.

In terms of REM, the direct relationship between impactful female directors and REM showed a significant negative effect; having at least one woman on the board also serving on the AC decreased the practice of REM. Regarding the moderating effect of OC, the result showed that OC weakened the significant negative relationship between impactful female directors and REM that was found in the direct regression. With the moderating effect of OC, impactful female directors became insignificantly negatively associated with REM. Although the factor of OC weakened the role of female directors in reducing the practice of REM, it had a lesser impact compared to the effect on AEM. The reason behind the different findings is that female directors have more awareness of the practice of REM.

Policymakers, stakeholders, scholars, and society will all benefit greatly from this research. It provides empirical findings that could assist all parties in re-evaluating the role of the board of directors, specifically impactful female directors, in minimizing EM. The findings highlight the influence of controlling shareholders introduced by agency theory II, which requires additional remedies from regulators.

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