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## Article

# The influence of independence and compensation of the directors on family firms and real earnings management

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## FINANCIAL ECONOMICS | RESEARCH ARTICLE

# The influence of independence and compensation of the directors on family firms and real earnings management

Adeeb Abdulwahab Alhebri<sup>1,2</sup>, Shaker Dahan Al-Duais<sup>2\*</sup> and Amal Mohammed Almasawa<sup>3</sup>

**Abstract:** This study investigates real earnings management in family firms and further examines the moderating effects of the independence and compensation of directors. Based on a sample of 106 non-financial public listed firms over 5 years in Saudi Arabia, the empirical results show that family firms are positively linked to real earnings management. This result supports the entrenchment hypothesis that family firms have lower earnings quality due to manipulation in real activities. Further, we found evidence that the proportion of independent directors and the compensation paid to directors both interacted in family firms to reduce real earnings management. Our findings suggest that increasing the proportion of independent directors and paying higher compensation to directors are one workable way for family firms to mitigate their real earnings management behaviour.

**Subjects:** Accounting; Corporate Governance; Asian Business

**Keywords:** family firms; real earnings management; directors' independence; director's compensation



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### PUBLIC INTEREST STATEMENT

This paper examines the relationship between family firms and REM in the Saudi Arabia market and further examines the moderating effects of the independence and compensation of directors in this relation. Family firms are spread widely there in the Saudi market. As a matter of fact, most existing studies examined the effects of family firms on AEM. However, to date, none of these variables have been explored as a moderating variable in the relationship between family firms and REM. The study uses secondary panel data that were manually obtained from annual reports and the Datastream of Thomson Reuters. The results revealed that family firms and REM have positive and significant relationship. The findings also found evidence that independent directors and compensation for directors play a moderating role in family firms to reduce REM. The findings could be used to develop a corporate governance structure by the controlling owners of family firms or by external investors.

## 1. Introduction

Family firms (FMF) play a significant role in global economic growth, whether in developed or developing countries. One study estimated that more than two-thirds of all businesses worldwide are owned or controlled by families and account for around half of gross domestic product (GDP) economic activity (Shanker & Astrachan, 1996). In the United States, family-controlled firms account for almost 90% of corporations (Poza, 2007). Family firms contributed between 30% and 60% of GDP in local European companies (Ifera, 2003). A study conducted by Andres (2008) revealed that two-thirds of the shares in the German market are owned by family members. Family firms are indeed the backbone of the Middle East economies, with some of the biggest families operating in this region via private companies (Trinidad, 2020). Saudi Arabia, dominant economy in the Gulf Cooperation Council (GCC) countries (Espinoza & Senhadji, 2011), is an interesting area in which to study family firms because of the large number there (Al-Dubai et al., 2012; Alhebri et al., 2020; Qobo & Soko, 2010). The vast majority of firms in Saudi Arabia are either family-owned or family-controlled (Qobo & Soko, 2010). Alhebri et al. (2020) showed that Saudi Arabia's family businesses account for 37% of Saudi-listed companies. Trinidad (2020) published, in *Forbes* magazine, a ranking of the ten most powerful family companies in Saudi Arabia, with the Olayan Group at the top of the list, followed by the Rashid Abdul Rahman Al-Rashed and Sons Group, and in tenth place the Al-Zahid Group.

Although studies of family firms have been popular in recent years Chi et al., 2015; Ghaleb et al., 2020b), the position of earnings management (EM), especially real earnings management (REM), remains a mystery in family firms (Al-Duais et al., 2019a; Al-Duais et al., 2019b; Ghaleb et al., 2020b). As the heterogeneity of ownership presents unique governance issues that characterize them from large-scale owned companies, family-run companies are able to provide an important platform for testing EM issues (C. W. Chi et al., 2015). One of the features of large-scale owned companies is the distinction between managers and owners, leading to agency conflicts between managers (agents) and owners (principals) (Jensen & Meckling, 1976). As professional managers are more informed about the company than owners, acting as agents, they have incentives to report information about financial accounting, which deviates from the substance of the underlying economic transactions, so as to maximize private benefits at the cost of shareholders or creditors (Wang, 2006). Concentrated ownership reduces traditional conflicts with owners in family-controlled firms because "the family's wealth is so closely linked to firm welfare, families may have strong incentives to monitor managers and minimize the free-riding problem inherent with small, diffused shareholders" (Anderson & Reeb, 2003, p. 1305). However, concentrated ownership by families may lead to conflict between external (minority) shareholders and controlling owners who act as potential agents for exploitation, creating a new agency conflict. This conflict is generally known as the principal-principal conflict (PP) (Fan & Wong, 2002; Shleifer & Vishny, 1997; Singla et al., 2014; Villalonga & Amit, 2006). This is because the controlling shareholders oversee reporting policies and thus have strong incentives to channel wealth from the publicly traded companies to firms they own privately to achieve private interests, by using transactions with related companies and by limiting public accounting information and manipulating earnings (Cheung et al., 2006; Fan & Wong, 2002; Park & Shin, 2004).

Previous empirical research has shown that founding family ownership is related to a higher quality of earnings for US and German firms (Achleitner et al., 2014; Ali et al., 2007; Boonlert-U-Thai & Sen, 2019). However, C. W. Chi et al. (2015) and Young et al. (2008) emphasized that PP conflicts are characterized by concentrated ownership and control, ineffective corporate governance, insufficient transparency, and a less rigid legal system that provides a greater opportunity for controlling owners to manipulate earnings. Fan and Wong (2002) suggest that, due to differences in ownership concentration and institutional environment, the findings from developed countries such as the United States cannot be readily generalized to the rest of the world. Corporate ownership is highly concentrated in Asian countries with weak legal systems, disclosure of financial reports is less transparent, and weak corporate governance mechanisms, including the boards

of directors (Chen & Hsu, 2009; Fan & Wong, 2002). Consequently, in Asia controlling shareholders have greater incentives to lower earnings quality (EQ) than in the US.

In light of the potential for principal-principal conflicts in family firms, the main objective of this study is to examine empirically the extent to which they actually exist in Saudi family businesses by investigating the relationship between family ownership and REM. We also examine the extent to which REM is restricted by the independence of the board. When the number of independent board members is high and compensation to board members is satisfactory, the board of directors (BOD) is better able to objectively monitor the management, thereby reducing the possibility of REM by family owners (Tai, 2017; C. W. Chi et al., 2015). As a matter of fact, most existing studies examined the effects of family ownership on accrual-based earnings management and the moderating effect of the independence and compensation of board members on this relationship (Tai, 2017). However, to date, none of these variables have been explored as a moderating variable in the relationship between family ownership and REM. Therefore, the independence of board members is a theoretically important subject in the field of publicly listed family firms. Saudi Arabia is the ideal environment for examining the impact of the independence of boards of directors on REM in family-controlled firms due to the high concentration of ownership, relatively poor corporate governance, and the abundance of family companies. The findings can serve as a reference for the controlling owners of a family firm or external investors in order to build a corporate governance structure for the family firm. The rest of the article is structured as follows. First, we start with an overview of the literature on family ownership, board independence, and board compensation, and propose testable hypotheses. Second, the research design is presented, and then empirical results are reported. We conclude with final remarks.

## 2. Literature review and hypothesis development

Family ownership can be defined as one or more family members (by blood or marriage) having strong management control, possessing a significant amount of the firm's shares, and acting as officers or directors of the firm. Although publicly listed companies controlled by families constitute the commonest ownership structure worldwide (Amran & Che-Ahmad, 2013; Burkart et al., 2003; Chu, 2011), there is little empirical study on them. In the US, Anderson et al. (2003) show that family-controlled companies represent one-third of S&P 500 companies, holding an average of 19% of the companies' equity share. Family firms contributed 30–60% of gross domestic product (GDP) of local economic activities in Europe (Ifera, 2003). A study conducted by Andres (2008) found that 63% of shares are in the possession of family members in the German market. According to La Porta et al. (1999), in East Asian countries families and governments usually control firms hierarchically. Additionally, Claessens and Yurtoglu (2013) confirmed that over half of the companies listed in East Asia are predominantly family-controlled. Carney and Child (2013) investigated how control and ownership changed among the largest firms from 1996 to 2008 in nine East Asian countries, confirming that family control is the prevalent ownership structure. Filatotchev et al. (2005) reported that more than two-thirds of companies registered in East Asian countries are controlled by single investors and that family members make up 60% of these companies' management. At the same time, control is largely through a pyramidal structure, including equity cross-holding, which makes the segregation of ownership from control more complicated (Filatotchev et al., 2005). In Saudi Arabia, families own and control the vast majority of companies (Qobo & Soko, 2010). According to Trinidad (2020), the Saudi market has the largest number of family firms in the Middle East.

Previous studies of family firms are based on stewardship theory and agency theory. This study adopted the agency theory rather than the stewardship theory because the stewardship theory, also known as the stakeholders' theory, takes a different approach from the agency theory. It is based on the premise that companies serve a broader social purpose than just maximizing the wealth of

shareholders and it's based on one foundation of aligning the goals of the agents with the goals of the company (Davis et al., 1997; Salvato & Moores, 2010). Family firms can have different agency problems from non-family companies since concentrated family control may minimize conventional principal-agent conflicts. This could lead to a principal-principal dispute, as family owners have the opportunity to take advantage of their concentrated ownership to expropriate the earnings of minority shareholders. Wang (2006), using S&P 500 companies, examined the relationship between family ownership and EQ and found that family ownership has two competitive effects on EQ: the effect of entrenchment and the effect of alignment. The entrenchment effect predicts that family firms are linked to lower EQ because the entrenched controlling owners can manage earnings in an opportunistic manner. This supports the agency problem (Jensen & Meckling, 1976) and the tunneling concept (Johnson et al., 2000), which indicates that controlling families are prone to engaging in transactions that transfer assets and profits to themselves (Munir et al., 2013). Evidence of the family entrenchment effect is stated in Fan and Wong (2002), who investigated the link between informativeness of earnings and structure of ownership among 977 registered companies in seven countries of East Asia (282 in Hong Kong, 66 Taiwanese, 177 Malaysian, 133 Singaporean, 95 South Korean, 91 Indonesian and 133 Thai). Their findings show that concentrated ownership is linked to low EQ because this structure gives owners the power and motivation to adjust earnings for confiscation and reporting uninformative figures in order to prevent detection. Similar findings indicate that family ownership is linked to higher accrual earnings management (AEM) (Chin et al., 2006; Ishak et al., 2011; J.-B. Kim & Yi, 2006; Kamran & Shah, 2014; Teh et al., 2017; C. W. Chi et al., 2015). Razaque et al. (2016) provided evidence that family firms in Bangladesh engage in REM, and Alhebri et al. (2020) and Tai (2017) provided evidence that family businesses participate in both AEM and REM, although they engage more in REM activities.

The alignment effect implies that family firms have a strong economic motivation to harmonize their interests with the interests of other stakeholders, lowering monitoring costs, and increasing EQ, because the founding families hold a substantial proportion of the shares and have a long-term presence in the company. The interests of families are closely aligned with the interests of the firm, discouraging them from managing earnings to avoid possible damage to the survival of the company and its reputation, in addition to enhancing longer-term performance (Anderson et al., 2003; Salvato & Moores, 2010; Wang, 2006). Accordingly, the alignment effect suggests that family members are less likely to expropriate other shareholder wealth by managing earnings. In line with the incentive alignment effect, Ali et al. (2007), Boonlert-U-Thai and Sen (2019), and Wang (2006) reported that family firms are associated with higher EQ. Similarly, Martin et al. (2016) indicated that family firms in the USA are less likely than non-family firms to manage their earnings. Hashmi et al. (2018) confirmed that family-owned companies have better EQ than non-family-controlled companies in Pakistan. In Spain, Sánchez et al. (2007) found that EQ occurs more among companies owned by families than non-family ones. In particular, they indicated that family companies have higher predictability of future cash flows and lower discretionary accruals. They concluded that the extent of the controlling family's voting rights has a positive influence on EQ. San Martin Reyna (2018) used firms listed on the Mexico stock market during 2005–15 as a sample, and produced empirical evidence showing that family firms mitigate EM, although the influence differs according to firm size. Boonlert-U-Thai and Sen (2019) provide evidence that accrual quality and the earnings stability of founding-family firms are higher than those of non-family firms. Chen et al. (2015) in Japan discovered a lower prevalence of AEM and REM in family-owned companies, although they employed AEM more often than REM to maintain their reputation and financial stability and the company brand name, and they may conduct cosmetic EM to conceal bad news. Achleitner et al. (2014), investigating the German stock market during 1998–2008, produced empirical evidence showing that family-owned companies are negatively correlated with REM and AEM. However, family companies have a lower tendency to indulge in REM, perhaps because they are less prone to gambling with the long-term prospects of their

investments; they may instead engage in AEM practices that assist them to keep trans-generational control. A recent study in Malaysia by Ghaleb et al. (2020b) found that family firms are negatively and significantly connected with REM at different levels of concentration.

In light of this discussion and given the corporate landscape in Saudi Arabia where family firms are common, we expect REM levels in family-run and controlled firms to be higher than in non-family firms. In accordance with agency theory as well as the perspective of the entrenchment hypotheses, this study posits the following hypothesis:

**H1:** Family firms are more likely to participate in real earnings management than non-family firms.

The BOD composition plays an important role in ensuring that it can effectively monitor management activities (Beasley, 1996). Although executive management is influential in BOD and possesses important information on the firm's activities, independent BOD members from outside contribute skills and objective analysis to prevent expropriation of the company's assets by majority shareholders (Anderson & Reeb, 2004; Dalton et al., 1998; Khalil & Ozkan, 2016). Fama and Jensen (1983) proposed that the board's fundamental role is to ensure that management behaves in compliance with owners' benefit and protects them from managers' opportunistic behaviour, in order to sustain their reputation. Anderson and Reeb (2004) claim that independent directors continue to be a force in family firms defending the interests of minority shareholders from the influence of controlling owners. If there is widespread and costly divergence between the interests of controlling and of minority shareholders, independent directors may intervene to safeguard the interests of all shareholders, not only the interests of controlling owners (Anderson & Reeb, 2004).

The presence of external directors and EM has been documented to be a negative connection in most previous studies. For instance, Klein (2002) and Xie et al. (2003) examined independent directors' influence on AEM, finding that it is unlikely that companies with a large number of independent directors will engage in EM. Likewise, Chouaibi et al. (2018) referenced that REM had a negative relationship with the proportion of independent board directors within a sample of Tunisian-listed firms. Recently, Kapoor and Goel (2019) found that a board dominated by external directors, who bring the company more experience and are more involved in supervising and controlling the company, will be able to reduce EM. Therefore, we expect a greater proportion of independent board members will restrict the positive relationship between family firms and REM. This brings us to our second hypothesis:

**H2:** Independent directors negatively moderate the relationship between family firms and real earnings management.

Resource dependence theory states that the prime responsibility of the BOD lies into assisting management in making the right decisions and high-quality strategy (Nicholson & Kiel, 2007). The theory assumes that independent directors provide more choice of resources for a firm and increase its contact with the external environment, reducing uncertainty in the market (Hillman et al., 2000; Pfeffer & Salancik, 1978). Directors contribute to a firm largely through the skills they bring, reaching buyers, suppliers and public policy makers and contributing to the positive valuation of the firm through reputation (Hillman et al., 2000). Agency theory states that compensation should have an increased performance function (Holmstrom, 1979); therefore, the more family firms pay its directors for their role in guidance and assisting management, the greater are the chances that the directors will be involved in supervision and the greater will be their balancing

power on private information. The balance of power can be used to examine the authenticity of private information that is shared by directors, thus reducing the asymmetry of information between directors (Tai, 2017). With less asymmetry of information, family firms should engage less in REM (Abad et al., 2018). Therefore, this study proposes a third hypothesis as follows:

**H3:** Directors' compensation negatively moderates the relationship between family firms and real earnings management.

### 3. Research design

#### 3.1. Sample selection and data

We manually extracted data relating to family ownership, board characteristics, and the BIG4 auditors from Saudi Arabian firms' annual reports and corporate governance reports of the Saudi Arabia listed stock exchange (Tadawul) website [www.tadawul.com.sa](http://www.tadawul.com.sa). Data was downloaded from Thomson Reuters Datastream for other variables. The sample was composed of all firms on the Saudi stock market from 2014 to 2018. For data homogeneity, the study follows past work by excluding financially related firms that are subject to various regulatory requirements (Al-Rassas & Kamardin, 2016; Baatour et al., 2017). Firms with missing financial information, insufficient data on the board directors or whose annual statements were not available were also excluded. The sample for this study was thus limited to 106 firms from 2014 to 2018, in six industries (see Table 1).

**Table 1. Industry classification and sample selection**

<b>Panel A: Classification of Sample Firms by Industry</b>	<b>No. of Firms</b>	<b>No of Obs.</b>	<b>% of the sample</b>
Communication & Energy	11	55	10.38
Consumer Discretionary	14	70	13.21
Consumer Staples	16	80	15.09
Industrials	21	105	19.81
Materials	35	175	33.02
Real Estate	9	45	8.49
Total	106	530	100
<i>Panel B: Sample selection</i>			
	<i>No. of Firms</i>		
Total number of companies listed on Saudi Arabia listed stock exchange (Tadawul)		202	
Excluded companies:			
Financial companies		53	
Missing data in the annual reports from 2014 to 2018		15	
Missing data to estimate REM for the period 2014–2018		28	
The final sample		106	
Total of observations for four years (106 Firms *5 years)		530	



### 3.2. Measuring real earnings management

Following the trend in previous REM research, this study is based on work which developed REM proxies. Following Cohen et al. (2008), Cohen and Zarowin (2010), and Roychowdhury (2006), REM intensity proxies focused on three ways to manipulate real activities: abnormal discretionary expenses (ADISEXP), abnormal levels of operating cash flows (ACFO) and abnormal production costs (APROD). The abnormal levels in these real activities are achieved by applying separate cross-sectional regression by industry and year:

$$\frac{CFO_t}{TA_{t-1}} = \beta_1 \left( \frac{1}{TA_{t-1}} \right) + \beta_2 \left( \frac{Sales_t}{TA_{t-1}} \right) + \beta_3 \left( \frac{\Delta Sales_t}{TA_{t-1}} \right) + \varepsilon_t \quad (1)$$

$$\frac{DISEXP_t}{TA_{t-1}} = \beta_1 \left( \frac{1}{TA_{t-1}} \right) + \beta_2 \left( \frac{Sales_{t-1}}{TA_{t-1}} \right) + \varepsilon_t \quad (2)$$

$$\frac{PROD_t}{TA_{t-1}} = \beta_1 \left( \frac{1}{TA_{t-1}} \right) + \beta_2 \left( \frac{Sales_{it}}{TA_{t-1}} \right) + \beta_3 \left( \frac{\Delta Sales_t}{TA_{t-1}} \right) + \beta_4 \left( \frac{\Delta Sales_{t-1}}{TA_{t-1}} \right) + \varepsilon_t \quad (3)$$

Where CFO<sub>t</sub> is operating cash flow in period t. DISEXP<sub>t</sub> is discretionary expenditure, defined as the sum of SG&A, R&D, and advertising expenditure. PROD<sub>t</sub> is the cost of production in period t, defined as the sum of cost of goods sold and the inventory changes. St is current sales, ΔSt is change in current sales, St-1 is lagged sales, ΔSt-1 is change in lagged sales and TAt-1 is lagged total assets. The above regressions produce the residuals of abnormal operating cash flow (ACFO), abnormal discretionary expenditure (ADISEX) and abnormal cost of production (APROD). To capture the effect of REM in a comprehensive measure through all these three variables, in this study we use aggregate REM measures. We define a REM aggregate measure as a sum of standardized variables, ACFO, ADISEX and APROD, in line with Cohen et al. (2008) and Braam et al. (2015).

### 3.3. Regression model and variables definitions

This study uses Equation 4 to test H1, which investigates REM on family firms. H1 can be supported if β<sub>1</sub> is significantly positive.

$$REM = \beta_0 + \beta_1 FMF + \beta_2 BIG4 + \beta_3 ROA + \beta_4 FSIZE + \beta_4 LEV + \beta_5 SGROW + e. \quad (4)$$

Equation 5 is used to test H2 and H3. If the interaction item (FMF \* BCOM) is significantly negative, then H2 can be supported. If the interaction term (FMF \* BIND) is significantly negative, then H3 can be supported. Table 2 defines the variables.

$$REM = \beta_0 + \beta_1 FMF + \beta_2 BIND + \beta_3 BCOM + \beta_4 FMF * BIND + \beta_5 FMF * BCOM + \beta_6 BIG4 + \beta_7 ROA + \beta_8 FSIZE + \beta_9 LEV + \beta_{10} SGRO + e. \quad (5)$$

## 4. Empirical results

### 4.1. Descriptive analysis and correlations

In Table 3, the sample was divided into two groups (family and non-family) based on a dummy equal to 1 when a firm is a family firm and zero otherwise, and a parametric t-test was used to examine if there were any significant differences in financial numbers. Table 3 shows the descriptive statistics of the main variables, for family and non-family firms. Over a third of companies in the sample are

**Table 2. Variable's definition and measurement**

Variables	Acronym	Definition
Real Earnings Management	REM	Abnormal levels of the real activities (ACOF, ADISEXP and APROD)
Family Firms	FMF	Percentage of number of outstanding shares held by family members on the board (fulfilling two requirements: (1) a company in which a person or a group is related by family ties by blood (i.e., share same surname), and (2) holds directly or indirectly at least 5% of the total number of outstanding common shares.
Board Independence	BIND	The ratio of independent directors from the total number of members of the board.
Board Compensation	BCOM	Total compensation of the board divided by the number of directors
Audit quality	BIG4	Dummy variable that equals 1 if the auditor is a Big 4 and 0 otherwise
Return on assets	ROA	Ratio of earnings before interest and tax (EBIT) to the total assets
Firm size	FSIZE	Natural logarithm of the firm's total assets
Firm leverage	LEV	Ratio of debt to assets
Sales growth	SGROW	Difference between the current year's sales and the preceding year's sales over the preceding year's sales

family firms (36.8%). The average share of family-owned common stock is about 8.9%. The average real activities (REM) of family firms are 0.000 (median -0.033), and of non-family firms 0.000 (median -0.081). This divergence is significant and gives us an initial indicator that Saudi family-owned firms have higher REM levels than non-family firms. There is a significantly lower average ratio of independent directors in family firms compared to non-family firms (0.455 vs 0.528). On average, the board's compensation in family companies is significantly higher than in family firms, respectively (400,912 vs 264,215 SAR). In terms of the audit quality (BIG4), more family firms are audited by Big4 audit firms than non-family firms, suggesting that in recent years more non-family firms have started to depend on non-Big4 auditors in Saudi Arabia. Further, by total assets (FSIZE), family firms tend to be slightly smaller than non-family firms, but with higher asset returns (ROA) and higher leverage ratio (LEV). They have lower sales growth (SGROW) than non-family firms.

Table 4 shows the Pearson correlation coefficients between the variables, indicating that they are all below 0.70, so multicollinearity is not a problem (Gujarati & Porter, 2008). Family firms have a significant positive correlation with REM, perhaps because they tend to participate in REM. Table 4 also shows that there are some important correlations between the independent variables. The highest correlation is 0.427 ( $p < 0.01$ ) between FSIZE and LEV, indicating that large firms have greater levels of debt. The correlation between FSIZE and BIG4 (0.411) is also significant, indicating that larger firms are audited by the big audit firms.

Table 3. Descriptive statistics

	Total sample (N = 530)				Family firms (N = 195)				Non-family firms (N = 335)				T-test		
	N	Mean	St.Dev	N	Mean	Median	St. Dev				St.Dev	Median	N	Mean	
REM	530	0.000	0.089	0	0.156	0.243	0.165	0.759	0.000	0.000	0.000	0.000	1.121	0.175	0.861
FMF	530	0.089	0.501	0	0.163	0.455	0.429	0.171	0	0	0	0	0	0	0
BIND	530	0.501	17.378	0.25	18.426	24.043	24.45	0.123	0.528	0.500	0.500	0.177	5.116	0.000	0.000
BCOM	530														
195															
335															
-4.006	0.000														
ROA	530	5.060	11.312	4.5	11.312	6.892	6.22	7.622	335	3.994	3.64	12.877	-2.864	0.004	0.004
FSIZE	530	14.765	14.575	14.575	1.586	14.583	14.414	0.908	335	14.871	14.734	1.864	1.718	0.086	0.086
LEV	530	22.679	21.36	21.36	18.426	24.043	24.45	14.503	335	21.886	16.69	20.343	-1.301	0.194	0.194
SGROW	530	10.909	0.25	0.25											
16.746	335	17.378	0.46	0.46											
Dichotomous Variables															
BIG4															

**Table 4. Correlation matrix**

	REM	FMF	BIND	BCOM	BIG4	ROA	FSIZE	LEV	SGRW	VIF
REM	1									
FMF	0.1495***	1								1.26
BIND	0.0517	-0.2458***	1							1.30
BCOM	-0.0009	0.2495***	-0.2353***	1						1.35
BIG4	0.0059	0.1755***	0.2189***	-0.2770***	1					1.33
ROA	-0.2079***	0.1365***	0.3481***	-0.1217***	0.2245***	1				1.37
FSIZE	-0.0269	-0.0981**	0.3054***	-0.3745***	0.4113***	0.1247***	1			1.84
LEV	0.0468	0.0163	0.0122	-0.1728***	0.2079***	-0.2670***	0.4269***	1		1.45
SGROW	0.0350	-0.0173	-0.0334	-0.0708*	0.0289	0.1179***	0.0823*	0.0458	1	1.04

Note: \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. Table 2 summarises variables definition

#### 4.2. Multivariate analysis

The study tested the fitness of the sample data with statistical assumptions before the regression analysis was carried out. We have winsorized all continuous variables in the first percentile (at the bottom) and 99th percentiles (at the top) to minimize the impact of outlier observations on the results. This approach also helps preserve the characteristics of the original data. Furthermore, the data can be considered as normal when the standard skewness score does not exceed  $\pm 3.00$  and kurtosis is lower than  $\pm 10.00$  (Kline, 2015). Moreover, based on the correlation matrix and the Variance Inflation Factor (VIF) tests, there is no evidence of multicollinearity problems. We used the Breusch-Pagan test to check for heteroscedasticity, and the result showed that no problems were present. The Durbin-Watson value of 1.499 is with the range -2 to 2, which means there is no problem with autocorrelation in the regression model. This study, therefore, adopted the pooled OLS regression, and hierarchy regression was applied to determine the robustness of the results, giving identical and largely similar results. The STATA data analytics software was used for a statistical data check.

The results of the regressions used for Equations 4 and 5 are shown in Table 5. We tested the first hypothesis (H1), which predicts that family firms are more likely to become involved in REM. The results show that the coefficient of FMF in Equation 4 is 1.051, which is significant at the 1% level ( $t = 4.20$ ), meaning that the probability of REM in family firms tends to be greater than in non-family firms. This finding is consistent with the entrenchment hypothesis, which proposes that the involvement of more family shareholders conflicts with other shareholders' interests and encourages managers to manage earnings opportunistically. The results are also consistent with previous empirical evidence from Asian companies that family firms have a greater incentive to practise earnings management and report lower EQ than non-family firms (Chin et al., 2006; Fan & Wong, 2002; Kamran & Shah, 2014; Razzaque et al., 2016; Tai, 2017; Teh et al., 2017; C. W. Chi et al., 2015). Therefore, hypothesis 1 is supported.

We examine the moderating role of the independence of the boards and the compensation of the directors to test hypotheses 2 and 3. Table 5 illustrates the moderating impacts with the proportion of independent directors (BIND) and with their compensation (BCOM). The results indicate that the interaction of FMF and BNID is negative and significant at the 5% level in Equation 5 ( $coef = -0.478$ ,  $t = -2.21$ ). This indicates that the presence of independent directors effectively reduces REM in family firms, supporting hypothesis 2. For hypothesis 3, Table 5 shows that the FMF and BCOM interaction coefficient is negative and significant at the 5% level ( $coef = -3.14e$ ,  $t = -2.04$ ), indicating that the larger the directors' compensation in family firms, the greater are the opportunities for directors to participate in supervision and to balance the provision of private information. Reducing information asymmetry in turn reduces the manipulation of real activities. Therefore, hypothesis 3 is supported.

**Table 5. Regression results for Equations 4 and 5**

REM	Equation 4 (Direct Effect)		Equation 5 (Moderating Effect)	
	Coef.	t-value	Coef.	t-value
FMF	1.051	4.20***	2.491	4.60***
BIND	-	-	0.650	2.49**
BCOM	-	-	5.36e	1.96**
FMF * BIND	-	-	-0.478	-2.21**
FMF * BCOM	-	-	-3.14e	-2.04**
BIG4	0.053	0.62	0.047	0.55
ROA	-0.028	-5.59***	-0.027	-5.27***
FSIZE	0.015	0.51	0.019	0.60
LEV	-0.002	-0.94	-0.001	-0.54
SGROW	0.002	1.61*	0.002	1.82*
Constant	-0.144	-0.36	-0.664	-1.35
R-squared	0.0819		0.1078	
F Value	7.78		6.27	
Proba > chi <sup>2</sup>	0.0000		0.0000	

In Equation 5 other control variables are similar to the empirical results of Equation 4 and consistent with the literature. Consequently, these details are not discussed further here.

Combining the empirical results of H2 and H3, independent directors continue to be one of the powers in family firms that contribute skills and objective analysis to prevent expropriation of the firm's assets by majority shareholders, thus reducing the likelihood of engaging in REM. Because family firms pay high compensation to their independent directors for their role in guidance and assisting management, this leads to greater opportunities for directors to be involved in supervision and balancing power from private information, thus restricting the manipulation of real activities.

## 5. Additional analyses

### 5.1. Alternative regression approach (hierarchical regression)

Although in our main analysis we used OLS regression, we also use hierarchical regression to strengthen our findings. Hierarchical regression analysis is an alternative comparative process with betas to evaluate the significance of the independent variables. Many authors suggest this regression as a common technique for the identification of moderating effects (Baron & Kenny, 1986; Endaya & Hanefah, 2016; Frazier et al., 2004). Four steps are taken in entering variables in the regression equation (see Table 6), as recommended by Baron and Kenny (1986) and Frazier et al. (2004). According to Hair et al. (2014), a moderate variable is significant only if a change occurs in R-squared ( $R^2$ ). In the first step,  $R^2$  was found to be 0.0510, indicating that the level of REM can be explained by the audit quality, ROA, firm size, leverage, and sales growth. In step 2, adding the independent variables,  $R^2$  increased to 0.0819. This implies that an additional increase (0.0309) in REM is explained by the FMF. In step 3, by adding BIND and BCOM,  $R^2$  is significantly changed by 0.0101, indicating that BIND and BCOM have a major effect on REM. In the final step, when the interaction was entered  $R^2$  increased from 0.0920 to 0.1078. This change in  $R^2$  (0.0158) is significant, indicating that BIND and BCOM affect the relationship between FMF and REM. The results of the hierarchical regression confirm the main results that the family firms practise REM significantly. The results also provide evidence to reinforce our

**Table 6. Results of hierarchical regression**

REM	Step 1		Step 2		Step 3		Step 4	
	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
Control V								
BIG4	0.125	1.48	0.053	0.62	0.067	0.79	0.047	0.55
ROA	-0.025	-4.96***	-0.028	-5.59***	-0.029	-5.64***	-0.027	-5.27***
FSIZE	-0.012	-0.42	0.014	0.51	0.027	0.86	0.019	0.60
LEV	-0.001	-0.48*	-0.002	-0.94**	-0.002	-0.89	-0.001	-0.54
SGROW	0.002	1.48	0.002	1.61	0.002	1.81	0.002	1.82*
FMF			1.051	4.20***	1.142	4.27***	2.491	4.60***
BIND					0.580	2.22**	0.650	2.49**
BCOM					2.31e	1.03	5.36e	1.96**
FMF*BIND							-0.478	-2.21**
FMF*BCOM							-3.14e	-2.04**
Constant	0.271	0.69	-0.144	-0.36	-0.693	-1.41	-0.664	-1.35
R-squared	0.0510		0.0819		0.0920		0.1078	
F Value	5.63		7.78		6.60		6.27	
Proba> chi <sup>2</sup>	0.0000		0.0000		0.0000		0.0000	

empirical findings that the effects of the interaction of the proportion of independent directors and the compensation of directors interacts negatively with FMF and REM.

### 5.2. REM individual measurements

This article traces previous studies of REM measurement suggested by Roychowdhury (2006) and applied as a comprehensive supplement to the three REM measurements (i.e. Cohen et al., 2008; Dong et al., 2020; Eng et al., 2019; Ghaleb et al., 2020a; Guo et al., 2015; Y. Kim & Park, 2014). However, W. Chi et al. (2011) argue that, although REM aggregates represent an overall level of REM, the three individual REM variables contain extensive information. Thus, for each individual measure of REM (ACFO, ADISEX, and APROD) measurement we re-examined the regression model after standardizing the variables. Table 7 shows that the results are identical to those shown in the main analysis, indicating that FMF is an important contributor to increasing REM through ADISEX and APROD but not through ACFO, as well as BIND and BCOM moderating the relationship between FMF and REM negatively.

### 6. Conclusions

This study examines the relationship between family firms and real earnings management; it also examines two characteristics of the board of directors that might prevent family firms from participating in REM: increasing the proportion of independent directors and increasing the amount of a director's compensation. From the sample of 106 non-financial public listed firms in Saudi Arabia during the period 2014 to 2018 (yielding 530 firm-year observations), the results reveal that family firms are more likely to participate in REM than are non-family firms in Saudi Arabia. Our findings are in line with Fan and Wong (2002) conclusion that family firms report lower-quality earnings than non-family companies in Asia. This finding may be caused by the family owners' entrenchment effects, or the demand for EQ from family firms may be low because of weak legislation or inefficient mechanisms for corporate governance in Saudi Arabia. Moreover, we find that the ratio of independent directors moderates the relationships between family firms and REM negatively, proposing that independent directors assist family firms in alleviating REM. Hence,

**Table 7. Regression results REM individual measurements**

REM	REM ADISEX		REM ACFO		REM APROD		REM aggregate	
	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
FMF	2.863	4.66***	-1.379	-2.53**	1.160	2.11**	2.491	4.60***
BIND	0.492	1.66*	-0.024	-0.09	0.221	0.83	0.650	2.49**
BCOM	8.95e	2.88***	9.40e	0.34	-2.54e	-0.91	5.36e	1.96**
FMF * BIND	-0.471	-1.92*	-0.191	-0.88	0.175	0.80	-0.478	-2.21**
FMF * BCOM	-5.52e	-3.15***	3.61e	2.33**	-1.96e	-1.25	-3.14e	2.04**
BIG4	0.167	1.74*	0.044	0.52	-0.188	-2.19**	0.047	0.55
ROA	-0.028	-4.76***	0.052	9.87***	-0.531	-10.08***	-0.027	-5.27***
FSIZE	-0.037	-1.02	0.002	0.06	0.057	1.75*	0.019	0.60
LEV	0.003	1.01	-0.010	-4.20***	0.006	2.48**	-0.001	-0.54
SGROW	0.003	2.51**	-0.002	-1.91*	0.001	0.91	0.002	1.82*
Constant	0.034	0.06	-0.054	-0.11	-0.722	-1.45	-0.664	-1.35
R-squared	0.1075		0.3003		0.2839		0.1078	
F Value	6.25		22.30		20.57		6.27	
Proba> chi <sup>2</sup>	0.0000		0.0000		0.0000		0.0000	

the second contribution of this study is determining that increasing the proportion of independent directors is a way for family firms to reduce the probability of participation in REM.

As regards the moderating effect of board compensation on the relationship between family firms and REM, the negative effects of board compensation are also found. The empirical findings demonstrate that if family firms pay higher compensation to directors, then REM behaviour will decrease significantly. The controlling owners of family firms or external investors might use the findings regarding REM in relation to governance practices, to recognize the important roles that director independence and compensation play in developing a corporate governance structure. The following limitations apply to this study. First, it concentrates on the institutional environment of Saudi Arabia. We cannot suppose the outcomes can be generalized easily to other emerging economies due to their various institutional backgrounds and regulatory environments. Furthermore, our analysis used a quantitative approach to achieve the objectives of this study, which may be considered as a limitation. A qualitative approach could be used to investigate further characteristics of directors, such as the personal, psychological, and social factors that may affect the relationship between owners and members of the board. Finally, the relationship between family firms and REM may also have implications for other institutional factors, such as the existence of an audit committee, which could reduce dubious corporate practices and increase financial accountability.

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