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The Dynamic Endogeneity Issue between Corporate Ownership Structure and Real-Based Earnings Manipulation in an Emerging Market: Advanced Dynamic Panel Model

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Abstract: This study aims to contribute to the existing literature by examining the relationship between corporate governance (CG) attributes and real-based earnings management (REM) in the context of an emerging market economy. The study employs a sample of 78 Egyptian Exchange (EGX)-listed companies covering the period from 2008 to 2017, yielding a total of 780 observations. To address dynamic endogeneity concerns between CG mechanisms and REM, the dynamic panel system-generalized method of moments (SGMM) estimator is used as the main analytical tool. The findings reveal that managerial and family ownership are negatively and significantly correlated with REM proxies, except for the ABCFO measure. By contrast, government and institutional ownership exhibit contrasting results, depending on the REM proxies used. The CG-EM relationship is influenced by several conflicting theoretical perspectives, including agency theory, institutional theory, stewardship theory, and resource dependence theory, resulting in inconsistent empirical findings. To the best of the authors' knowledge, this study is the first to detect Real-earnings manipulation practices (REM) in the Egyptian context using six models to confirm the validity, reliability, and robustness of the findings. Additionally, the study employs an advanced statistical technique that considers endogeneity, heteroscedasticity, and simultaneity in the relationship between CG mechanisms and earnings quality. The results highlight the importance of considering the institutional and legal context of a country when analyzing the impact of corporate governance mechanisms on earnings quality, as the practice and implementation of governance mechanisms vary across countries.

Keywords: corporate governance; earnings management; emerging market; dynamic panel model; endogeneity



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1. Introduction

The implementation of corporate governance (CG) reforms is crucial for developing countries like Egypt to address various financial issues, including frequent government intervention, high ownership concentration, human resource uncertainties, illiquid stock markets, weak legal and judiciary systems, investor protection and economic uncertainties (Reed 2002; Samaha et al. 2012). Adopting CG reforms in these countries has the potential to enhance growth, employment, economic development, and credit ratings (Amer 2016). It can also boost the confidence of corporations and encourage current and potential international investors to invest in the emerging market (Reed 2002; Dahawy 2008).

As a central player in the Middle East region, Egypt is unique compared to common law countries such as the US and the UK, with a civil law system that is characterized by

ineffective and inadequate regulatory systems, noncompliance with disclosure requirements of the Egyptian accounting standards, high conformity of accounting earnings to taxable income, and a lack of control and monitoring mechanisms to check compliance with accounting standards (Samaha and Dahawy 2010; Samaha et al. 2012). Despite the passage of the Sarbanes–Oxley (SOX) Act, earnings manipulation practices persist in emerging markets, including Egypt, where institutional settings, corporate behavior, and market conditions differ from developed countries (Li et al. 2022; Attia et al. 2022).

Egyptian organizations have been involved in fraudulent reporting to attract additional investments, maintain a high financial performance, and increase share prices and credit ratings (Kamel and Elbanna 2012). There are various barriers to the adoption of CG practices in Egypt, including government ownership dominance, lack of research and development (R&D) capabilities, wide business networks, weak investor protection, illiquid stock markets, weak legal control, and economic uncertainties (Soliman 2013; El-Sayed Ebaid 2013). As a result, the Egyptian capital market has been described as inefficient compared to common law countries, negatively affecting its level of transparency and relevance in the financial market (Soliman 2013; Hassouna 2014). The implementation of CG in Egypt is voluntary, not legally binding, and companies are motivated to adopt international best practices in the best interest of owners and stakeholders (El-Sayed Ebaid 2013; Mostafa 2017). This has resulted in a low level of CG application and its impact on the stock exchange performance and control of earnings manipulation practices (Samaha et al. 2012; Kamel and Elbanna 2012).

This study adds to the literature by investigating the extent to which various types of ownership structure diminish earnings manipulation practices in the setting of an emerging market economy with a well-established stock market. It addresses several gaps in the existing literature. Firstly, while there is substantial evidence available on earnings manipulation practices in most organizations, the main focus of previous studies has primarily been on accrual-based earnings manipulation. This study focuses on investigating how CG mechanisms reduce real-based earnings manipulation. Secondly, it is the first to investigate comprehensive combination of ownership structure (Family, Managerial, Institutional, and governmental own) with different proxies of REM. There is a dearth of studies that investigated this association especially in the emerging and developing countries compared with developed economies. Thirdly, the study used several sophisticated measures of REM, concentrating on different proxies of REM to be able to understand very well the role of ownership structure on REM. Fourth, previous studies in CG and earnings manipulation have used static panel data analysis (GLS) and pooled regression analysis, which are not appropriate due to dynamic endogeneity and unobserved firm heterogeneity in the relationship between CG and earnings manipulation. This study employs a system-generalized method of moments (GMM) estimator to address these limitations. Finally, prior literature has not fully explored the impact of endogeneity issues on research findings. This study evaluates the influence of potential endogeneity issues on research findings and compares the results from different methodologies.

2. Literature Review and Hypothesis Development

Several empirical studies, both in developed and developing nations, have examined the relationship between ownership structure and financial reporting quality. The conflict of interests between management and outside shareholders, or between majority and minority shareholders, has been extensively examined in the context of ownership structure and its impact on corporate value (Shleifer and Vishny 1997). In developed countries, agency problem I is prevalent due to highly diffused ownership, while in developing countries and emerging markets, agency problem II is more prevalent due to highly concentrated ownership in the hands of a small number of major shareholders, such as government- or family-linked firms (Omran et al. 2008; Al-Duais et al. 2021). The concentration of ownership serves as a justification for further study in investigating the relationship between ownership structure, agency problem, real-earnings management, and financial reporting quality. Although, there is extensive research that examined the

impact between corporate governance mechanisms such as (board of directors and audit) on alleviating earnings manipulation (a kind of agency problem), there are a few studies that concentrated on the ownership structure and REM practices (Al-Duais et al. 2021; Attia 2020; Attia et al. 2023).

2.1. Managerial Ownership and Earnings Management

The literature on the relationship between managerial ownership and earnings management practices has produced mixed results, both in developed and emerging markets. Managerial ownership has conflicting effects on earnings management, supporting both the alignment hypothesis and the entrenchment hypothesis (Jensen and Meckling 1976).

Empirical studies have shown a positive association between managerial ownership and earnings management, as higher levels of managerial ownership increase the discretionary power and authority of managers, leading them to entrench themselves and prioritize their interests over those of the shareholders (Fama and Jensen 1983; Ayadi and Boujelbene 2014; Aygun et al. 2014). This is in line with the entrenchment hypothesis, which states that higher levels of managerial ownership negatively affect the financial reporting quality (Al-Fayoumi et al. 2010; Charfeddine et al. 2013; Sepasi et al. 2016; Ogbonnaya et al. 2016; Waweru and Prot 2018). Additionally, low levels of managerial ownership can lead to an increase in earnings manipulation as managers have more incentives to manipulate financial information and earnings to increase their compensation plans, relax contractual constraints, and reduce debt restrictions (Jensen and Meckling 1976).

Conversely, other studies have found a negative association between managerial ownership and earnings management, suggesting that increasing the level of managerial ownership may reduce the incentives for managers to expropriate the shareholder's interest, aligning their interests with those of the shareholders (Jensen and Meckling 1976; Butt and Hasan 2009; Daraghma and Alsinawi 2010; Alves 2012; Farouk and Bashir 2017). This view is supported by the stewardship theory and alignment hypothesis proposal, which assumes that there are no conflicts of interest between shareholders and management and that directors act as stewards of the company's assets on behalf of the shareholders and stakeholders (Donaldson and Davis 1994; Davis et al. 1997). The theory suggests that inside directors are better suited to govern and control the board, make better decisions, and promote the shareholders' wealth as they have an in-depth understanding of the business, easy access to operating information, technical and operational expertise, and organizational dedication (Alves 2012; Farouk and Bashir 2017).

In the Egyptian context, the relationship between managerial ownership and earnings management has not been extensively studied. The available evidence is not clear-cut, with some studies finding that the influence of corporate governance mechanisms on earnings management depends on the level of controlling and managerial ownership (Khalil and Ozkan 2016).

H1. *There is a significant and negative relationship between the managerial ownership and real-based activity management (REM).*

2.2. Family Ownership and Earnings Management

The literature on the impact of ownership structure on firm value has extensively been explored in both developed and developing countries. This literature has taken into account the agency costs between managers and outside shareholders or among majority and minority shareholders (Shleifer and Vishny 1997). In developed countries, agency problem I is prevalent due to the highly diffused ownership structure. On the other hand, agency problem II is more pronounced in developing countries, where ownership is highly concentrated in the hands of a few major shareholders, such as individuals or the government (Omran et al. 2008).

From the perspective of agency theory, family ownership is considered to mitigate managerial entrenchment and expropriation due to the integration of ownership and

control. A family firm has strong incentive to make harmonization between their interests and the stakeholders' interest, thereby decreasing the monitoring cost, thus, reducing the cost of earnings manipulation (Al-Duais et al. 2021). Large block-holders and managers are viewed as the owners and residual claimants who control family-owned firms. Therefore, concentrated shareholding by family firms can be seen as an optimal organizational form, where the interests of the controlling minority shareholders, stakeholders, and the firm are aligned (Villalonga and Amit 2010). As a result, family-owned firms are believed to face fewer hazards than non-family firms as they have strong incentives to oversee the firm's management and reduce the principal-agent conflict (Jensen and Meckling 1976; Anderson and Reeb 2003; Young et al. 2008; Audretsch and Lehmann 2014).

The agency theory aligns with the investment efficiency viewpoint, which emphasizes the relevance of family shareholding. To preserve their interests, family businesses have a significant incentive to dynamically monitor and control the firm's management (the efficient monitoring hypothesis or alignment effect). They are more likely to reduce agency costs by improving monitoring functions and eliminating free-rider and adverse selection issues (Wang 2006; Xiao and Yuan 2007; Siregar and Utama 2008). This, in turn, enables managers to focus more on long-term earning prospects rather than short-term goals, limiting their discretion in decision-making (Wang 2006; Xiao and Yuan 2007; Siregar and Utama 2008; Usman and Yero 2012; San Martin-Reyna and Duran-Encalada 2012; Boonyawat 2013). Similarly, Ghaleb et al. (2020) suggested that family firms at different levels of ownership concentration have lower incidences of REM practices than non-family firms. San Martin Reyna (2018) in the Mexican context and Al-Duais et al. (2021) in Malaysian context also revealed a negative relationship between the family firms and REM practices.

On the other hand, from agency theory II or principle-principle theory, there is a counter-argument regarding the impact of family ownership on reporting quality. Large block-holders with control rights over the firm's assets may use these powers to influence decision-making in their favor, rather than in the interest of minority shareholders (Young et al. 2008). On the basis of entrenchment hypothesis, managers in family firms may be inclined to make business decisions that benefit their offspring and enhance family socio-emotional wealth at the expense of minority investors (Ibrahim and Samad 2011; Halioui and Jerbi 2012). This could include hiring incompetent relatives for key positions, avoiding strategic initiatives, and making inappropriate acquisitions, all of which could negatively impact financial reporting quality through the expropriation hypothesis (Wang 2006; Siregar and Utama 2008). Family owners may also expropriate shareholder interests through overconsumption, internal transactions, and special dividends (Wang 2006; Siregar and Utama 2008). Additionally, acting in their own self-interest can negatively impact employee effort and productivity, even to the point of taking possession of employee income (Usman and Yero 2012).

In the Egyptian context, most firms are dominated by high family ownership (Mohamed and Habib 2013; Khlif et al. 2015), where there is no separation between ownership and control. Studies have found a weak correlation between ownership concentration and firm value (Omran et al. 2008) and a reduction in voluntary disclosure with an increase in block-holder ownership (Samaha and Dahawy 2011). However, Shahwan (2015) found no link between ownership concentration and financial performance or financial distress, attributing this to poor corporate governance practices. On the other hand, Khlif et al. (2015) found that greater ownership dispersion plays a significant role in reducing the cost of equity and enhancing voluntary disclosure. Despite this, highly concentrated ownership may have access to private information, leading to a reduced tendency to enhance voluntary disclosure, which can negatively impact the cost of capital (El-Moslemany and Nathan 2019). Based on these findings, the authors propose the following hypothesis based on the notion of the alignment effect, which determines that family firms are more concerned with reducing REM manipulations for the purpose of protecting shareholders' wealth and firm growth and reputation for future generations.

H2. *There is a significant and negative relationship between family ownership and REM.*

2.3. Institutional Ownership and Earnings Management

Theoretically, the relationship between institutional ownership and earnings management (EM) practices has been underpinned by two conflicting views. These two contradictory views were suggested by [Pound \(1988\)](#) and are private benefit hypothesis and efficient monitoring hypothesis ([Attia et al. 2023](#)).

On one hand, the efficient monitoring hypothesis provides the rationale for the negative relationship between institutional own and earnings manipulation practices, as institutional shareholders act as fiduciaries, assigned to monitor functions, to minimize potential for managerial self-interest and to deliver superior performance through CEO and top management reward systems ([Hadani et al. 2011](#); [Bushee et al. 2013](#); [Yang et al. 2009](#)). On such study, by [Kałdoński et al. \(2020\)](#), and [Al-Duais et al. \(2021\)](#) found that firms with high percentage of institutional ownership are more concerned with reducing aggressive REM practices and with more monitoring on the management behaviors. Some studies ([Habbershon and Williams 1999](#); [Habbershon et al. 2003](#); [Sirmon and Hitt 2003](#); [Siregar and Utama 2008](#); [Gürbüz et al. 2010](#); [Hadani et al. 2011](#); [Farooq and El-Jai 2012](#); [Alves 2012](#); [Aygun et al. 2014](#); [Farouk and Bashir 2017](#)) have provided evidence of a critical and active role played by institutions in monitoring, disciplining, and controlling managerial discretion. These studies have shown a negative association between institutional investors, particularly long-term institutions with low turnover and concentrated portfolios, and discretionary accruals (DAs). The characteristics of institutional ownership, such as age, professionalism, education, tenure, and outside representation, can be considered as supportive attributes for wider corporate networks and effective decision-making processes, leading to improved resource acquisition ([Larcker et al. 2007](#); [Sahut and Othmani-Gharbi 2010](#)). [Mellado and Saona \(2020\)](#) found that institutional ownership and a highly regulated system effectively minimize EM practices in Latin America.

Conversely, private benefit hypothesis predicts that institutions who are characterized by frequent trading and fragmented ownership are discouraged from actively engaging in corporate governance (CG) of their portfolio firms. Thus, a positive association between transient institutional investors, with high turnover and diversified portfolios, and earnings manipulation has been explored ([Agnes-Cheng and Reitenga 2009](#); [Abdul-Jalil and Abdul-Rahman 2010](#)). For instance, [Latif and Abdullah \(2015\)](#) found a positive and significant relationship between EM practices and institutional ownership for low-growth firms, but not for high-growth firms, in a study of 120 non-financial firms listed on the Karachi Stock Exchange in Pakistan from 2003 to 2012. [Issarawornrawanich and Jaikengkit \(2011\)](#) found a positive association between institutional ownership and EM practices in Thailand in 2007. This result is consistent with the findings of [Lin and Manowan \(2012\)](#), who showed that short-term institutional investors tend to increase EM practices to prevent earnings decreases in response to current earnings news. Similar studies such as ([Debnath et al. 2021](#)) have also shown that institutional ownership positively affects REM.

Surprisingly, several studies ([Koh 2003](#); [Ding et al. 2007](#); [Fazlzadeh et al. 2011](#); [Lin and Manowan 2012](#); [Song 2013](#)) have proposed a U-Curved relationship between institutional shareholding and earnings quality, based on the alignment and entrenchment hypothesis, which suggests that ownership concentration may be useful to a certain extent, but beyond this level, it begins to have a negative impact. [Iqbal and Strong \(2010\)](#); [Abdul-Jalil and Abdul-Rahman \(2010\)](#); [Al-Fayoumi et al. \(2010\)](#); and [Yang et al. \(2009\)](#) have verified that there is a non-significant relationship between EM practices and institutional investors due to their inefficient control and lack of financial experience to detect EM practices.

In the Egyptian financial market, institutional shareholding is highly prevalent and has a crucial impact. According to the EGX Quarterly Report, institutions accounted for more than 66.14% of the total value traded and were net buyers with a net equity of 361.80 million pounds in Q1 2010 ([El-Ghouty and El-Masry 2017](#)). The study conducted from 2005 to 2011 revealed that the proportion of institutional ownership among various entities (banks, investment funds, public and private companies, insurance, individuals, and holdings) was up to 52.4%, with the highest percentage held by public and private corporates (18.3%) and the lowest by investment

funds (0.02%). This proportion is consistent with the study by [El-Diftar et al. \(2016\)](#), who found that the mean institutional ownership in the Egyptian context was around 47.97% for a sample of the most active 50 firms from 2007 to 2011. However, there is limited research in emerging markets like Egypt that has ignored the institutional ownership literature. For instance, the study by [El-Diftar et al. \(2016\)](#) found that low and high levels of institutional ownership concentration were positively associated with voluntary disclosure, as firms are concerned with improving their image and reputation in front of the public and aim to increase transparency and integrity in financial reporting. Conversely, the study found that moderate levels of ownership were negatively associated with voluntary disclosure. Based on these findings, this study proposes that institutional investors may reduce REM:

H3. *There is a significant and negative relationship between institutional ownership and real-based activity management (REM).*

2.4. Governmental Ownership and Earnings Management

The relationship between companies owned by states, government agencies, local authorities, and governmental departments and their Environmental Management (EM) practices has been limitedly studied in the past ([Chen and Yuan 2004](#); [Ding et al. 2007](#); [Liu and Lu 2007](#); [Xiao and Yuan 2007](#); [Wang and Yung 2011](#); [Capalbo et al. 2014](#); [Alnabsha et al. 2018](#)). There is no clear agreement on the relationship between governmental ownership and the quality of earnings.

Based on the insights of the resources dependency theory, it suggests that organizations can minimize their dependence on environmental factors through methods such as mergers, political action, executive succession, and joint ventures ([Hillman et al. 2009](#)). The presence of the government as a major shareholder can reduce uncertainty and external dependence on environmental contingencies. When the enterprise has high government ownership, the government may coordinate the socio-political and economic systems of the country to meet stakeholders' expectations for social and environmental information. Some studies have shown a negative association between public ownership and EM practices because the government provides protection and incentives for state-owned firms to reduce earnings manipulation ([Chen and Yuan 2004](#); [Wang and Yung 2011](#)). [Capalbo et al. \(2014\)](#) found that state-owned enterprises (SOEs) manage earnings less frequently than privately owned enterprises (POEs). However, this is not in line with the results of a study by [Poli \(2015\)](#) on 13,724 unlisted Italian private companies from 2012–2014, which found a positive and significant association between publicly held organizations and EM practices. This may be due to the lower efficiency and effectiveness of Italian SOEs and their tendency to prevent too positive or negative levels of earnings in front of the public.

On the other hand, an organization with high government ownership may use its power to change the conditions of the external economic environment and create a more favorable environment through regulation ([Nguyen 2016](#)). This can lead to lower voluntary disclosure and transparency as a result of expropriation activities. Additionally, managers in government enterprises have less motivation to improve corporate profitability and promote financial reporting ([Wang et al. 2008](#); [Nguyen 2016](#); [Hoang et al. 2018](#)). Studies such as those by [Chen et al. \(2008\)](#); [Poli \(2015\)](#) has shown a positive association between state-owned organizations and EM practices. They found that public sectors are not focused on improving corporate governance (CG) and audit quality. [Guo and Ma \(2015\)](#) found a positive relationship between SOEs and earnings manipulation, especially if the SOEs are largely managed by public company representatives at different ownership levels. [Ji et al. \(2015\)](#) studied the effect of CG reforms in China from 2000 to 2010 and found that the government transferred state ownership to the general public to improve the quality of CG and financial reporting. Contrary to this, [Alnabsha et al. \(2018\)](#) reported a non-linear relationship between government ownership and mandatory and voluntary disclosure in Libya from 2006 to 2010. [Xiao and Yuan \(2007\)](#) in China found no significant relationship between state ownership and disclosure quality. In Iran, [Sepasi et al. \(2016\)](#) also found no significant relationship between state ownership and disclosure quality.

In Egypt, there is limited research that has explored the relationship between governmental ownership and opportunistic earnings management. Studies such as [El-Moslemany and Nathan \(2019\)](#); [Samaha and Dahawy \(2011\)](#) found a lack of significance between public ownership and earnings management or voluntary disclosure, respectively. The former study suggested that the global financial crisis may have caused managers to engage in earnings manipulation despite the ownership structure, while the latter study found no relationship between government ownership and voluntary disclosure. This lack of research on the relationship between state ownership and earnings management in both developed and emerging markets, such as Egypt, presents an opportunity for further investigation in this area. Based on these arguments, this study proposes the following hypothesis:

H4. *There is a significant and positive relationship between governmental ownership and real-based earnings management.*

3. Research Methodology and Data Analysis

3.1. Data

We used the Egyptian Exchange (EGX)-listed enterprises to create our database. The EGX has grown again as a result of an economic reform program and privatization. In 2017, there were 226 publicly traded companies on stock markets. In this analysis, we used a sample of 78 publicly traded non-financial enterprises from 2008 to 2017. Financial, insurance, and investment firms, enterprises without data for at least three years, and firms with considerably lacking corporate governance data were omitted from our research. We obtained 780 firm-year observations from 78 firms. The calculation of REM proxies is based on two years prior to the base year for study. The study spans the years 2008 to 2017. The EGX and Egypt for Information Dissemination (EGID) are the primary sources of ownership structure data, which are manually collected. Data for the control variables set and EM proxies are computed using data from the DataStream.

3.2. Variables Measurement

The objective of our study is to analyze to what extent to CG mechanisms can help mitigate earnings manipulation based on real-based activities. To accomplish this, we use a dynamic panel systemized generalized method of moment to better address potential unobservable heterogeneity, simultaneity, and dynamic endogeneity problems as proposed by [Arellano and Bover \(1995\)](#); [Blundell and Bond \(1998\)](#). The econometric model to examine the linear relationship between ownership structure and financial reporting quality is presented in Equation (1);

$$\text{Real EM}_{jt} = \beta_0 + \beta_1 \text{MNG.OWN}_{jt} + \beta_2 \text{FAM.OWN}_{jt} + \beta_3 \text{INS.OWN}_{jt} + \beta_4 \text{GOV.OWN}_{jt} + \beta_5 \text{ROA}_{jt} + \beta_6 \text{ROE}_{jt} + \beta_7 \text{LIQ}_{jt} + \beta_8 \text{Lev}_{jt} + \beta_9 \text{Gear}_{jt} + \beta_{10} \text{Size}_{jt} + \beta_{11} \text{AT}_{jt} + \beta_{12} \text{OC}_{jt} + \beta_{13} \text{EMFLEX}_{jt} + \varepsilon_t \quad (1)$$

where,

MNG.OWN refers to Managerial ownership; FAM.OWN refers to Family ownership; INS.OWN refers to Institutional ownership; GOV.OWN refers to Governmental ownership; ROA refers to return on assets; ROE refers to return on equity; LIQ refers to liquidity; Lev refers to leverage; Gear refers to gearing; Size refers to firm size; MKT refers to the market capitalization; AT refers to asset tangibility; OC refers to the operating cycle; EMFLEX refers to EM-flexibility. REM models are analyzed and reported: (i) abnormal cash flows from operations (ABCFO); (ii) abnormal production costs (APROD); (iii) abnormal discretionary expenditures (ADISX); and three aggregate proxies of REM.

3.2.1. Dependent Variables: REM Measurement Models

The accrual-based EM (AEM) is exposed to a greater investigation from regulators and auditors more than real-based activities (REM) ([Cohen and Zarowin 2010](#); [Zang 2012](#)). Recent literature suggested that organizations increasingly shift their EM practices from AEM to REM for several reasons; high quality of audit, restricted rules and regulation that control the use of AEM, and adoption of IFRS and tighter accounting standards ([Attia 2020](#); [Ghaleb et al. 2020](#)).

REM is conducted through the manipulation of real-activities occurring during the year. Roychowdhury (2006, p. 3) defined this type of manipulation as: “A departure from normal operational practices, motivated by managers’ desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations. These departures do not necessarily contribute to firm value even though they enable managers to meet reporting goals”. As a result, corporations are increasingly inclined to perform manipulations through real-earnings activities. Roychowdhury (2006) revealed that REM can be accomplished by manipulating operating cash flow, overproducing inventory to reduce the cost of goods sold, reducing discretionary expenditures such as advertising and R&D, and general selling and administrative costs (Roychowdhury 2006; Cohen and Zarowin 2010; Kuo et al. 2014). The study here employed a more complex measure of REM, employing a total of six proxies for quantifying REM (Attia 2020; Attia et al. 2022).

First; REM Through Operating Cash Flow (Roychowdhury 2006)

This model is used to detect REM as proposed by (Roychowdhury 2006; Cohen and Zarowin 2010; Zamri et al. 2013; Kuo et al. 2014). When managers attempt to raise earnings by manipulating sales, they offer some discount prices and more flexible credit terms to customers to raise the volume of sales temporarily especially at the end of the year. As a result, the reported profit at the end of the year will increase, and at the same time, this sales manipulation leads to abnormal cash flows from operations. Cash flows from operations for the given level of sales become lower, especially during the period of discounts and extended credit terms (Attia 2020). The model of cash flow from operation is described as a linear function of sales and change in sales in the current year. This model can be expressed as follows:

$$CFO_{it}/A_{it-1} = \beta_1 [1/A_{it-1}] + \beta_2 [Sales_{it}/A_{it-1}] + \beta_3 [\Delta Sales_{it}/A_{it-1}] + \varepsilon \quad (2)$$

where,

CFO_{it} = the cash flow from operating activities in year t.

The estimate coefficient from the above regression equation is calculated to obtain the normal level of cash flow from operations. Thus, the normal cash flow from operations has been deducted from the actual cash flow to calculate the abnormal cash flow.

Second; REM Through Production Costs (Roychowdhury 2006)

The degree of production costs that is regarded as abnormal is one of the most distinguished and well-known varieties of REM. Since the fixed cost per unit decreases as the manufacturing volume increases, the extent to which the cost of goods sold through overproduction of stock has been estimated. The usual level of production is estimated using a cross-section of at least seven enterprises in each industry. The estimated residual can be used to calculate the abnormal amount of production cost. An over-production of inventory reduces the cost of goods sold, which enhances the company’s residual and reported profitability so that normal production levels may be maintained. As a result, the following model can be used to calculate the normal production level:

$$PROD_{it}/A_{it-1} = \beta_1 [1/A_{it-1}] + \beta_2 [Sales_{it}/A_{it-1}] + \beta_3 [\Delta Sales_{it}/A_{it-1}] + \beta_4 [\Delta Sales_{it-1}/A_{it-1}] + \varepsilon \quad (3)$$

where,

$PROD_{it}$: The sum of cost of goods sold and change in inventory of firm i in year t;

$Sales_{it}$: Sales of firm i in year t;

$\Delta Sales_{it}$: Sales of firm i in year t less sales of firm i in year t – 1;

$\Delta Sales_{it-1}$: Sales of firm i in year t – 1 less sales of firm i in year t – 2.

Third; REM Through Discretionary Expenses (Roychowdhury 2006)

REM is also performed through the reduction of discretionary expenditures such as selling and marketing expenses, advertising expenses, R&D expenses, and general and administrative expenses to raise the firm’s earnings. Therefore, earnings within the current period will be improved as a result of reducing such discretionary expenses, which leads to higher cash flows during the current period, which may lead to lower future cash flows,

if these expenses were generally paid in cash. Roychowdhury's (2006) model is used to estimate the normal discretionary expenses:

$$\text{DISEXP}_{it}/A_{it-1} = \beta_1 [1/A_{it-1}] + \beta_2 [\text{Sales}_{it-1}/A_{it-1}] + \varepsilon \quad (4)$$

where,

DISEXP_{it} : The total of selling and marketing expenses and general and administrative expenses, advertising expenses, and research and development expenses of firm i in year t .

In addition to the three proxies extracted from these models, three comprehensive proxies for REM activities are constructed to compute the entire effect of REM, as follows, in accordance with Kuo et al. (2014); by multiplying ABCFO by (-1) and then adding ABPROD, the first aggregate model is obtained. As proposed by Cohen and Zarowin (2010); Braam et al. (2015), higher levels of RM1 indicate a higher level of REM (upward REM).

$$\text{RM1} = -\text{Abnormal cash flows from operations} + \text{Abnormal production costs}$$

After multiplying ABCFO by -1 , the second aggregate model is calculated by adding ABDISCX to ABCFO. As a result, the greater the value of these aggregate proxies, the greater the sales manipulation and drop in discretionary spending for earnings manipulation. Cohen and Zarowin (2010); Braam et al. (2015) propose it as follows:

$$\text{RM2} = -\text{Abnormal cash flows from operations} - \text{Abnormal discretionary expenditures.}$$

After multiplying ABCFO and ABDISCX by -1 , the third aggregate proxy is identified by combining (ABDISCX), (ABPROD), and (ABCFO) together (Zang 2012). The greater the value of each of the three aggregate metrics, the greater the likelihood that the firm is involved in REM.

$$\text{RM3} = -\text{Abnormal cash flows from operations} + \text{Abnormal production costs} - \text{Abnormal discretionary expenditures.}$$

3.2.2. Main Independent Variables

The following section thoroughly determines how each independent variable is measured. As described in the empirical and theoretical review, the ownership structure is considered a critical mechanism for the quality and comprehensiveness of the oversight administered in the organization. Four variables represent the ownership structure of the firm, namely, family ownership, managerial ownership, institutional ownership and governmental ownership.

Managerial Ownership

It is the total ownership held by executive directors scaled by the total shares outstanding in a given year (e.g., Hutchinson and Gul 2004; Al-Ghamdi 2012; Alves 2012; Ayadi and Boujelbene 2014; Amer 2016; Farouk and Bashir 2017; Waweru and Prot 2018).

Family Ownership

Following the prior studies of Akimova and Schwödiauer (2004); Omran et al. (2008); Habbash (2010); Usman and Yero (2012); Al-Ghamdi (2012); Abata and Migiro (2016), this study measures the family ownership as the ratio of total shares owned by family members.

Institutional Ownership

With regard to the previous literature such as Koh (2003); Zouari and Rebaï (2009); Yang et al. (2009); Iqbal and Strong (2010); Issarawornrawanich and Jaikengkit (2011); Farooq and El-Jai (2012); and Al-Ghamdi (2012), institutional ownership is determined as the number of the shares owned by institutions over the total outstanding shares. It is the sum of financial institutional ownership, securities investment trust funds ownership, incorporated company's ownership, pension fund, corporate institutions, mutual funds, foreign financial institutions, foreign institutions, foreign mutual funds, and other institutions.

Government Ownership

This study calculates governmental ownership (GOV.OWN) as the total number of ordinary shares held by all governments scaled by the total volume of ordinary shares held by a firm at the conclusion of its fiscal year (Xiao and Yuan 2007; Al-Ghamdi 2012; Alnabsha et al. 2018). There is no agreement on theoretical assumptions about the relationship between state ownership and earnings quality. We use numerous control variables to help balance the company- and business-specific variability in the sample that have the potential to influence the dependent variables EM (see Table 1). Different control variables are included to organize the causal association in a model in order to obtain a more complete empirical model and remove the endogeneity problem. We include control variables such as leverage (LEV), operating cycle (OC), firm size (Size), profitability (ROA and ROE), gearing (Gear), liquidity (LIQ), asset tangibility (TANG), and market capitalization (MTKCAP) (Emile et al. 2014; Samaha et al. 2015; Al-Najjar and Clark 2017; Zalata et al. 2018).

Table 1. Summary of variables and their measurement.

	Label	Measure	Source
Independent variables			
Family ownership	FAMOWN	The proportion of total shares held by family members.	Annual Disclosure Books By EGX and ownership structure reports
Institutional ownership	INSTOWN	The proportion of outstanding shares owned by institutional investors at the end of its financial year.	
Managerial ownership	MANOWN	The proportion of shares possessed by managers scaled by the total number of ordinary shares.	
Governmental ownership	GOVOWN	The total number of ordinary shares held by the government scaled by the total number of ordinary shares of a firm at the end of its financial year.	
Dependent Variable			
Real Earnings Management	REM	Abnormal levels of cash flow from operations (ABCFO). Abnormal level from the sum of selling and marketing expenses and general and administrative expenses (ABDISCX). Abnormal level from the sum of cost of goods sold and change in inventory (ABPROD). $RM1 = -\text{Abnormal cash flows from operations} + \text{Abnormal production costs}$. $RM2 = -\text{Abnormal cash flows from operations} - \text{Abnormal discretionary expenditures}$. $RM3 = -\text{Abnormal cash flows from operations} + \text{Abnormal production costs} - \text{Abnormal discretionary expenditures}$.	Data stream and financial Statements
Control variables			
Firm size	SIZE	The natural log of a company’s assets at the end of its fiscal year.	Data stream and financial statements
Liquidity	LIQ	Ratio of current assets to current liabilities.	
Performance	ROA	It is the net income less preferred dividends scaled by average assets at the ending of the year.	
Performance	ROE	It is the net income multiplied by average total equity at the end of the year.	
Capital structure (Gearings)	GEAR	At the end of the fiscal year, total debt—both short-term and long-term—is divided by total equity.	
Leverage	LEV	At the end of its fiscal year, the book value of total debt, total debt—both short-term and long-term—divided by total assets.	
Assets Tangibility	ASSTAN	The net property plant and equipment is a percentage of total assets.	
Operating Cycle	OC	The logarithm of the inventory and receivables periods added together.	
Earnings Management Flexibility	EMFLEX	Total inventories and receivables scaled by total assets.	

4. Results and Discussion

4.1. Descriptive Statistics

Table 2 displays descriptive statistics for all variables. The descriptive statistics of REM provide the lowest, maximum, and mean of six REM measurement models (ABCFO), (ABPROD), (ABDISCX), (RM1), (RM2), and (RM3). ABCFO and ABDISCX are multiplied by -1 to indicate that high levels of EM proxies correspond to higher amounts of upward REM behavior. As a result, a greater mean value indicates a higher degree of REM on average. Furthermore, positive mean values indicate average income-increasing REM. According to the findings shown above, enterprises engage in a greater degree of real earnings manipulation by overproducing inventories at a lower cost of products sold, resulting in significant anomalous production costs when compared to other proxies of REM. In terms of ownership variables, the results show that on average, managerial, family, institutional, and government ownership are 16.79%, 3.7%, 19.7%, and 21.4%, respectively. This suggests that, on average, government stockholders owned the majority of the enterprises.

Table 2. Descriptive statistics.

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
FAM	780	0	23.6	3.756564	7.072643	1.793	1.93
MAG	780	0	72	16.521618	23.2383773	1.213	0.033
INST	780	0	74.5	19.231841	25.4300124	1.015	−0.49
GOV	780	0	93.4	21.385859	30.7899223	1.27	0.104
ROA	780	−0.0398	0.2163	0.051876	0.0650379	0.957	0.472
ROE	780	−0.0688	0.374	0.100429	0.1185833	0.813	−0.089
LIQU	780	0.5147	5.0461	1.833757	1.1885192	1.375	1.141
LEV	780	0.0182	0.6098	0.232505	0.1724446	0.618	−0.626
GEAR	780	0.0195	2.0804	0.518018	0.5552779	1.554	1.667
ASSTTANG	780	0.0089	0.78	0.356718	0.2437437	0.134	−1.156
OC	780	4.0974	6.8154	5.351267	0.7572294	0.219	−0.776
EMFLEX	780	0.0799	0.8734	0.400584	0.2238405	0.557	−0.596
FIRM-Size	780	4.6774	6.9666	5.691671	0.6958374	0.374	−1.037
ABCFO	780	−0.1161	0.3152	0.063246	0.109628	0.622	−0.033
ABPROD	771	−0.3129	0.9497	0.15093	0.3463521	0.889	−0.085
ABDISX	780	−0.0001	0.1245	0.046524	0.0356111	0.742	−0.45
RM1	780	−0.5193	0.9232	0.091336	0.3780786	0.535	−0.286
RM2	780	−0.3813	0.0752	−0.112051	0.1188598	−0.659	−0.152
RM3	780	−0.61	0.9132	0.041996	0.3932643	0.479	−0.237
Valid N (listwise)	770						

This table displays the descriptive data for the various REM models. The columns for CG characteristics and firm-level characteristics on REM for firms in Egypt from 2008 to 2017 show the minimum, maximum, mean, standard deviation, skewness, and kurtosis values. ACFO is an abbreviation for abnormal cash flows from operations scaled by lagged total assets; APROD is an abbreviation for abnormal production costs scaled by lagged total assets; and ADISX is an abbreviation for abnormal discretionary expenditures scaled by lagged total assets. RM1 denotes aggregate proxy 1, RM2 denotes aggregate proxy 2, and RM3 denotes aggregate proxy 3.

4.2. Multicollinearity Diagnostics

The multicollinearity test was conducted to ensure that no multicollinearity problematic happens. The study performed Variance Inflation Factor (VIF) tests to check for multicollinearity. The VIFs values for all models are within acceptable limits. Gujarati (2003) suggested that a value of less than 10 shall be accepted. The VIF values of each independent variable are presented in Table 3, showing that the maximum VIF for ROA is 5.5, which is lower than the acceptable threshold value for VIF.

Table 3. Test results for VIF and tolerance values.

Variable	VIF	1/VIF
ROE	5.5	0.179769
ROA	5.4	0.182472
Gear	3.50	0.2845660
Leverage	3.12	0.320985
Gov Own	2.9	0.334147
Institutional Own	2.7	0.359389
Managerial Own	2.30	0.435571
Operating Cycle	1.76	0.566583
Liquidity	1.67	0.600512
Asset Tangibility	1.64	0.610499
EM Flexibility	1.58	0.633835
Family Own	1.47	0.679588
Firm Size	1.03	0.964374
Mean VIF	2.09	

4.3. Results of System Generalized method of Moment

As is known, the common problem in accounting research is endogeneity. Specifically, there is a common claim revealed from the relationship between different CG mechanisms and EMs, which is the influence by the potential sources of endogeneity and biased parameter estimators. Three major sources of endogeneity can be determined as time-invariant unobserved heterogeneity across firms, simultaneity and dynamic endogeneity (Nguyen et al. 2014; Al-Zoubi 2016; Thrikawala et al. 2017; Schultz et al. 2017; Attia 2020; Attia et al. 2022).

Therefore, most of the previous empirical studies used a fixed/random effect approach or traditional instrumental variables (IV) to overcome the endogeneity problem that comes from simultaneity or/and unobserved heterogeneity. However, these techniques are not designed to deal with the problem of dynamic endogeneity, which arises when the CG-EM relationship is affected by the performance of previous years. Consequently, if this problem is not controlled, then it is not possible to determine the causal effects of these estimations. Previous studies in CG and EMs do not explore the dynamic nature of this relationship. Therefore, the current study is interested in using dynamic panel SGMM techniques taking into account the endogeneity problem that may arise from the dynamic nature of this association and the unavailability of appropriate instruments for CG-EM research (Attia et al. 2022, 2023).

The endogeneity problem can arise from unobservable heterogeneity (if there are unobservable factors that can influence both dependent and explanatory variables), simultaneity (if the independent variables are a function of the dependent variable or expected values of the dependent variables), and dynamic endogeneity (if the relationships among the firm's observable characteristics are likely to be dynamic) (Ammann et al. 2011). Accordingly, these assumptions mean system-generalized method of moment (SGMM) is the preferred and superior model over OLS regression, and (GLS) to control for the problems of endogeneity by using instrumental variables (Al-Fayoumi et al. 2010; Ammann et al. 2011; Wintoki et al. 2012; Khémiri and Noubbigh 2018; Attia 2020). Accordingly, the current study follows Wintoki et al. (2012) and uses dynamic panel SGMM estimator as proposed by Arellano and Bover (1995); Blundell and Bond (1998) to control for those problems using the lagged values of the IV to face the problem of reversal causality (Attia 2020; Al-Duais et al. 2021). Indeed, most empirical research in CG and EM practices suffer from an endogeneity problem that may bias the estimate of how (X) independent variables affect (Y) dependent variables (Attia et al. 2022, 2023).

The following Tables 4–10 show the impact of CG mechanisms on the REM using different proxies for EMs based on SYSTEM GMM. The commentary highlights how much the CG qualities are statistically related to REM, taking into account the dynamic nature of the relationship. The lagged REM is used as an explanatory variable to manage the dynamic character of the governance–EM relationship. The dependent variable is now referred to as the REM utilizing six proxies: (ABCFO), (ABPROD), (ABDISCX), and each of the three

aggregate proxies, RM1, RM2, and RM3. After controlling firm-level variables, the study creates numerous models to evaluate each mechanism of CG individually with six proxies of the real activity-based EM models, as shown in the following equations. Consistent with REM models, the analysis begins by looking at each CG mechanism separately, as well as the firm-level drivers of REM models, as given in Equation.

$$EM_{it} = \beta_0 + \beta_1 EM_{it-1} + \beta_2 Governance_{it} + \beta_j \sum_{j=4}^{13} X_{it} + \varepsilon_{it}$$

where,

Governance indicators include; MANOWN = managerial ownership; FAMOWN = family ownership; INSTOWN = institutional ownership; GOVOWN = governmental ownership; Xit; control variables include ROA = return on assets; ROE = return on equity; LIQ = liquidity; Lev = leverage; Gear = gearing; Size = firm size; MKT = market capitalization; AT = Asset Tangibility; OC = operating cycle; EMFLEX = EM-flexibility. REM is measured by six proxies (ABCFO, ABPROD, ABDISCX, RM1, RM2, RM3).

Table 4. Governance indicators and ABCFO: system-GMM estimation results.

VARIABLES	ABCFO	ABCFO	ABCFO	ABCFO
L.ABCFO	−0.0430 *** (0.0111)	−0.0486 *** (0.0116)	−0.0479 *** (0.00987)	−0.0335 *** (0.00812)
Mag	0.000107 * (5.72 × 10 ^{−5})			
Fam		0.000717 *** (0.000246)		
Gov			−0.00020 *** (4.00 × 10 ^{−5})	
Inst				0.000133 * (7.05 × 10 ^{−5})
ROA	0.0613 (0.146)	0.0729 (0.155)	0.0147 (0.232)	−0.308 (0.227)
ROE	0.137 ** (0.0563)	0.123 *** (0.0441)	0.106 (0.0911)	0.206 *** (0.0790)
Liq	0.00571 ** (0.00291)	0.00539 ** (0.00225)	0.00768 *** (0.00250)	0.00875 *** (0.00206)
Lev	−0.0194 (0.0281)	0.00474 (0.0368)	−0.0169 (0.0395)	0.0205 (0.0270)
Gear	−0.0155 * (0.00820)	−0.0212 ** (0.00873)	−0.0223 *** (0.00780)	−0.0238 *** (0.00590)
Size	0.0444 *** (0.00937)	0.0376 *** (0.0111)	0.0532 *** (0.00782)	0.0459 *** (0.00901)
Asstan	−0.121 *** (0.0296)	−0.149 *** (0.0328)	−0.180 *** (0.0264)	−0.190 *** (0.0215)
OC	−0.0524 *** (0.00925)	−0.0537 *** (0.0136)	−0.0317 *** (0.0101)	−0.0416 *** (0.0132)
Emflex	0.0236 (0.0182)	0.0237 (0.0228)	0.00318 (0.0225)	0.0428 * (0.0239)
Constant	0.108 (0.0773)	0.159 (0.103)	−0.0117 (0.0558)	0.0567 (0.0824)
Observations	702	702	702	702
Number of firms	78	78	78	78
Number of inst	122	122	122	122
Hansen test (<i>p</i> -val)	0.999	0.999	0.998	0.999
AR (2) test (<i>p</i> -val)	0.348	0.344	0.330	0.341

The results of system-GMM estimations for dynamic panel-data models are presented in this table. The REM based on abnormal cash flow from operations is the dependent variable. The sample consists of 780 observations from 2008 to 2017. The validity of the over-identifying limitations is never rejected by two-step findings or Hansen J tests. The residuals' second order autocorrelation (AR(2)) is always rejected. In brackets, standard errors are indicated. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. MANOWN = management ownership; FAMOWN = family ownership; INSTOWN = institutional ownership; GOVOWN = governmental ownership; Xit; ROA = return on assets; ROE = return on equity; LIQ = liquidity; Lev = leverage; Gear = gearing; Size = company size; MKT = market capitalization; AT = asset tangibility; OC = operational cycle are all control variables. EMFLEX is an abbreviation for EM-flexibility. REM is measured by six proxies (ABCFO, ABPROD, ABDISCX, RM1, RM2, RM3).

Table 5. Governance indicators and ABPROD: system-GMM estimation results.

VARIABLES	ABPROD	ABPROD	ABPROD	ABPROD
L. ABPROD	0.0419 *** (0.00905)	0.0615 *** (0.0163)	0.0460 *** (0.0100)	0.0550 *** (0.0126)
Mag	−0.000472 *** (8.00×10^{-5})			
Fam		(-7.73×10^{-5}) (0.000189)		
Gov			0.000416 *** (4.55×10^{-5})	
Inst				(2.21×10^{-5}) (6.04×10^{-5})
ROA	−0.556 ** (0.262)	−0.340 (0.238)	−0.484 * (0.248)	−0.371 (0.265)
ROE	0.158 (0.118)	0.0515 (0.108)	0.224 * (0.128)	0.0720 (0.121)
Liq	0.00122 (0.00340)	0.00345 (0.00239)	0.00181 (0.00310)	0.00495 (0.00358)
Lev	0.119 *** 0.0419 *** (0.00905)	0.0130 (0.0311)	0.133 *** (0.0351)	0.145 *** (0.0357)
Gear		0.0460 *** (0.00980)	0.0116 (0.0135)	0.00663 (0.0160)
Size	−0.0545 *** (0.0145)	−0.0474 *** (0.0113)	−0.0776 *** (0.0162)	−0.0518 *** (0.0150)
Asstang	0.0988 *** (0.0370)	0.0434 (0.0334)	0.0822 ** (0.0362)	0.0271 (0.0427)
OC	0.164 *** (0.0104)	0.182 *** (0.0186)	0.148 *** (0.0218)	0.162 *** (0.0164)
Emflex	−0.0191 (0.0460)	−0.0335 (0.0372)	0.0350 (0.0325)	0.0115 (0.0409)
Constant	−0.482 *** (0.102)	−0.586 *** (0.125)	−0.298 ** (0.152)	−0.493 *** (0.136)
Observations	702	702	702	702
Number of firms	78	78	78	78
Hansen test (<i>p</i> -val)	0.999	0.998	0.999	0.999
AR (2) test (<i>p</i> -val)	0.585	0.539	0.737	0.597

The results of system-GMM estimations for dynamic panel-data models are presented in this table. The REM is the dependent variable in the abnormal production cost model. *, **, *** significant levels at 10%, 5%, and 1%, respectively.

Table 6. Governance indicators and ABDISCX: system-GMM estimation results.

VARIABLES	ABDIX	ABDIX	ABDIX	ABDIX
L. ABDISCX	−0.256 *** (0.0134)	−0.228 *** (0.00858)	−0.250 *** (0.00947)	−0.256 *** (0.00850)
Mag	-3.51×10^{-5} *** (1.22×10^{-5})			
Fam		-9.84×10^{-5} *** (2.89×10^{-5})		
Gov			7.46×10^{-5} *** (1.30×10^{-5})	
Inst				-7.96×10^{-5} *** (1.19×10^{-5})
ROA	0.0712 (0.0563)	0.0217 (0.0605)	0.118 ** (0.0559)	0.00987 (0.0638)
ROE	−0.0167 (0.0278)	0.0162 (0.0300)	−0.0503 * (0.0296)	0.00562 (0.0321)
Liq	−0.000512 (0.000645)	−0.000244 (0.000363)	−0.00113 * (0.000632)	0.000216 (0.000641)
Lev	0.0279 *** (0.00833)	0.0409 *** (0.00974)	0.0183 (0.0132)	0.0190 * (0.0106)

Table 6. *Cont.*

VARIABLES	ABDIX	ABDIX	ABDIX	ABDIX
Gear	−0.0187 *** (0.00255)	−0.0177 *** (0.00285)	−0.0176 *** (0.00298)	−0.0183 *** (0.00212)
Size	−0.0137 *** (0.00411)	−0.0143 *** (0.00189)	−0.0117 *** (0.00301)	−0.0120 *** (0.00241)
Asstan	−0.0288 ** (0.0113)	−0.0149 * (0.00762)	−0.0378 *** (0.00737)	−0.0251 ** (0.0123)
OC	0.0637 *** (0.00570)	0.0549 *** (0.00536)	0.0613 *** (0.00456)	0.0577 *** (0.00501)
Emflex	−0.0316 ** (0.0124)	−0.0183 * (0.00969)	−0.0208 *** (0.00516)	−0.0176 ** (0.00816)
Constant	−0.182 *** (0.0348)	−0.146 *** (0.0323)	−0.172 *** (0.0252)	−0.167 *** (0.0270)
Observations	702	702	702	702
Number of firms	78	78	78	78
Hansen test (<i>p</i> -val)	1.000	1.000	0.999	1.000
AR (2) test (<i>p</i> -val)	0.239	0.273	0.245	0.254

The results of system-GMM estimations for dynamic panel-data models are presented in this table. The REM based on the abnormal discretionary expenditures model is the dependent variable. *, **, *** significant levels at 10%, 5%, and 1%, respectively.

Table 7. Governance indicators and RM1: system-GMM estimation results.

VARIABLES	RM1	RM1	RM1	RM1
L. RM1	0.0395 *** (0.0119)	0.0434 *** (0.0112)	0.0315 ** (0.0147)	0.0313 ** (0.0144)
Mag	−0.000702 *** (0.000120)			
Fam		0.000450 (0.000360)		
Gov			0.000496 *** (8.10×10^{-5})	
Inst				−0.000194 *** (6.86×10^{-5})
ROA	−0.614 (0.387)	−0.439 (0.398)	−0.543 (0.370)	−0.564 (0.347)
ROE	0.0204 (0.151)	−0.101 (0.155)	−0.00583 (0.134)	0.0283 (0.135)
Liq	−0.00265 (0.00649)	−0.00612 (0.00511)	−0.00918 (0.00599)	−0.00163 (0.00450)
Lev	0.0530 (0.0481)	0.0308 (0.0664)	0.0808 * (0.0465)	0.0158 (0.0465)
Gear	0.0652 *** (0.0129)	0.0714 *** (0.0185)	0.0686 *** (0.0120)	0.0705 *** (0.00981)
Size	−0.0968 *** (0.0216)	−0.115 *** (0.0218)	−0.0862 *** (0.0218)	−0.0957 *** (0.0191)
Asstan	0.245 *** (0.0542)	0.270 *** (0.0638)	0.290 *** (0.0585)	0.326 *** (0.0695)
OC	0.201 *** (0.0226)	0.203 *** (0.0340)	0.186 *** (0.0262)	0.186 *** (0.0237)
Emflex	0.0600 (0.0435)	0.0656 (0.0593)	−0.0269 (0.0690)	0.0406 (0.0480)
Constant	−0.549 *** (0.116)	−0.494 *** (0.156)	−0.551 *** (0.134)	−0.501 *** (0.150)
Observations	702	702	702	702
Number of firms	78	78	78	78
Hansen test (<i>p</i> -val)	0.999	0.999	0.997	0.999
AR (2) test (<i>p</i> -val)	0.742	0.700	0.730	0.690

This table presents the results from system-GMM estimations for dynamic panel-data models. The dependent variable is the REM based on RM1 model. *, **, *** significance levels at the 10%, 5% and 1% levels, respectively.

Table 8. Governance indicators and RM2: system-GMM estimation results.

VARIABLES	RM2	RM2	RM2	RM2
L. RM2	−0.00176 (0.00907)	0.00526 (0.0119)	−0.0117 (0.00993)	−0.00151 (0.0101)
Mag	-4.69×10^{-6} (4.24×10^{-5})			
Fam		−0.000507 (0.000340)		
Gov			0.000168 *** (6.46×10^{-5})	
Inst				−0.000148 *** (5.12×10^{-5})
Roa	0.148 (0.160)	0.0565 (0.178)	−0.141 (0.216)	0.222 (0.188)
ROE	−0.242 *** (0.0604)	−0.197 *** (0.0716)	−0.101 (0.0920)	−0.258 *** (0.0744)
Liq	−0.00461 * (0.00275)	−0.00212 (0.00212)	−0.00244 (0.00539)	−0.00681 ** (0.00270)
Lev	−0.00226 (0.0244)	−0.0121 (0.0586)	0.00605 (0.0535)	−0.0621 ** (0.0256)
Gear	0.0358 *** (0.00650)	0.0408 *** (0.0138)	0.0363 *** (0.0114)	0.0464 *** (0.00852)
Size	−0.0291 *** (0.00922)	−0.0351 ** (0.0146)	−0.0349 *** (0.00527)	−0.0249 ** (0.00992)
Asstan	0.142 *** (0.0178)	0.172 *** (0.0410)	0.178 *** (0.0341)	0.166 *** (0.0170)
OC	−0.0210 * (0.0120)	−0.0272 ** (0.0131)	−0.0383 *** (0.0112)	−0.0284 ** (0.0133)
Emflex	0.0176 (0.0202)	0.00491 (0.0171)	0.0390 (0.0345)	−0.00602 (0.0220)
Constant	0.124 (0.0931)	0.183 (0.122)	0.216 *** (0.0733)	0.149 (0.104)
Observations	702	702	702	702
Number of firms	78	78	78	78
Hansen test (<i>p</i> -val)	1.000	0.999	0.999	0.999
AR (2) test (<i>p</i> -val)	0.349	0.353	0.343	0.349

This table presents the results from system-GMM estimations for dynamic panel-data models. The dependent variable is the REM based on RM2 model. *, **, *** significance levels at the 10%, 5% and 1% levels, respectively.

Table 9. Governance indicators and RM3: system-GMM estimation results.

VARIABLES	RM3	RM3	RM3	RM3
L. RM3	0.0401 *** (0.0147)	0.0406 *** (0.0150)	0.0305 *** (0.00988)	0.0241 (0.0169)
Mag	−0.000384 *** (0.000133)			
Fam		−0.000164 (0.000388)		
Gov			0.000554 *** (7.88×10^{-5})	
Inst				−0.000186 * (9.67×10^{-5})
Roa	−0.535 (0.383)	−0.766 * (0.419)	−0.743 * (0.386)	−0.600 (0.415)
ROE	−0.0303 (0.145)	0.0604 (0.166)	0.101 (0.137)	0.0420 (0.152)
Liq	−0.00569 (0.00432)	0.000931 (0.00671)	−0.00122 (0.00548)	−0.00118 (0.00644)

Table 9. Cont.

VARIABLES	RM3	RM3	RM3	RM3
Lev	0.0605 (0.0525)	0.0625 (0.0555)	0.0788 * (0.0471)	0.0312 (0.0429)
Gear	0.0825 *** (0.0141)	0.0676 *** (0.0181)	0.0686 *** (0.0173)	0.0863 *** (0.0107)
Size	−0.0715 ** (0.0288)	−0.0714 *** (0.0275)	−0.0618 *** (0.0173)	−0.0671 *** (0.0260)
Asstan	0.298 *** (0.0516)	0.263 *** (0.0630)	0.378 *** (0.0692)	0.333 *** (0.0610)
OC	0.174 *** (0.0300)	0.159 *** (0.0324)	0.153 *** (0.0243)	0.150 *** (0.0360)
Emflex	−0.0297 (0.0689)	−0.0169 (0.0648)	−0.0496 (0.0510)	0.00348 (0.0707)
Constant	−0.605 *** (0.201)	−0.518 *** (0.197)	−0.576 *** (0.160)	−0.528 ** (0.229)
Observations	702	702	702	702
Number of firms	78	78	78	78
Hansen test (<i>p</i> -val)	0.998	0.999	0.998	0.997
AR (2) test (<i>p</i> -val)	0.487	0.512	0.490	0.461

The results of system-GMM calculations for dynamic panel-data models are shown in this table. The REM is the dependent variable in the RM3 model. The sample consists of 780 observations from 2008 to 2017. The validity of the over-identifying limitations is never rejected by two-step findings or Hansen J tests. The residuals' second order autocorrelation (AR(2)) is always rejected. In brackets, standard errors are indicated. *, **, *** significant levels at 10%, 5%, and 1%, respectively.

Table 10. Summary of system-GMM CG mechanisms and real-based activity EMs practice.

	Expected Sign	ABCFO	ABOPRO	ABDISX	RM1	RM2	RM3
Ownership Structure							
Mag. own	+	Positive and significant at 10%	Negative and significant at 1%	Negative and significant at 1%	Negative and significant at 1%	Negative and non-sig	Negative and significant at 1%
Fam. Own	—	Positive and significant at 1%	Negative and non-sig	Negative and significant at 1%	Positive and non-significant	Negative and non-sig	Negative and non-sig
Inst. Own	—	Positive and significant at 10%	Positive and non-sig	Negative and significant at 1%	Negative and significant at 1%	Negative and significant at 1%	Negative and significant at 1%
Gov. Own	+	Negative and significant at 1%	Positive and sig at 1%	Positive and significant at 1%	Positive and significant at 1%	Positive and significant at 1%	Positive and significant at 10%

With regard to managerial ownership, the SGMM analysis as shown in Tables 4–10 reveals that the coefficient of managerial ownership is negative and significant at 1% significance across four models of REM (ABPROD, ABDISCX, RM1, RM3) and non-significantly based on RM2, whereas the coefficient is positive and significant based on (ABCFO) as proxies of REM at a 10% significance level. This result is partially consistent with the claim of (H1), which assumes a significant and negative link between the proportion of managerial ownership and the extent to which REM is conducted. This result is consistent with [Khalil and Ozkan \(2016\)](#), who revealed that at lower levels of managerial ownership, top management and the controlling shareholder may have more likelihood to expropriate firm resources either for their consumption or capital market objectives (e.g., seeking more compensation, meeting or exceeding market analysts forecast and avoiding debt covenant violations). However, at high levels of managerial ownership, the powerful manager/controlling shareholder can act as monitoring and controlling mechanisms to reduce the opportunistic earnings manipulation as they would not like to bear a larger share of the decline in firm value resulting from opportunistic EM. [Tran and Dang \(2021\)](#) also suggested that increasing the ownership

concentration of management may be a good and effective mechanism, especially in small firm, and can be used as a monitoring mechanism in case of the weakness of the other corporate governance mechanisms. They suggested that it is critical to align between manager interest and shareholder interest by raising the management shareholding to encourage them to actively monitor and manage the organization's interest to protect their investment.

The results are inconsistent with the majority of empirical studies that revealed a positive association between managerial ownership and EM such as the studies of [Ayadi and Boujelbène \(2014\)](#) in France; [Aygün et al. \(2014\)](#) in Turkey; and [Al-Fayoumi et al. \(2010\)](#) in Jordan discovered that the association between managerial ownership and EM is consistent with the entrenchment hypothesis where executive ownership is ineffective in aligning the interests of shareholders with insiders' interests to make value-maximizing decisions. However, this relationship has changed due to changes in the economic condition of the country, especially in times of economic downturns. This outcome is constant with the stewardship theory, which assumes that there is a convergence between manager and shareholders' interest as executives devote their effort and time to achieve organizational objectives ([Peasnell et al. 2005](#); [Habbash 2010](#); [Al-Ghamdi 2012](#)). On the other hand, this result contradicts the Agency Theory that expects that managers are likely to conceal firm earnings to maximize their wealth at the expense of the shareholders' interest due to the division between ownership and control. These results are not also in line with the entrenchment hypothesis, which proposes that insiders' ownership might turn out to be useless in supporting insiders to make value-maximizing decisions. For instance, [Al-Fayoumi et al. \(2010\)](#) in Jordan; [Ayadi and Boujelbène \(2014\)](#) in France; [Aygün et al. \(2014\)](#) in Turkey; and [Waweru and Prot \(2018\)](#) in Eastern Africa revealed a positive and significant relationship between managerial ownership and DAs. They suggested that most of the emerging countries with weak investor protection policies give managers the opportunities to conceal earnings and to misuse corporate resources, which hence leads to wealth expropriation. However, other studies ([Al-Duais et al. 2021](#)) revealed a non-significant relationship between managerial ownership and REM due to the lack of separation between management and ownership, especially in family firms.

With regard to family ownership, Tables 4–10 show the results of the six regression models about family ownership. Two competing hypotheses could explain the relationship between family ownership and REM. A positive and significant relation is found between the proportion of family ownership and REMs based on (ABCFO) at a 1% significance level and insignificantly associated with (RM1). This result is consistent with entrenchment hypothesis. [Razzaque et al. \(2016\)](#) in Bangladesh revealed that family firms conduct more real earnings manipulation especially at an early stage of ownership concentration, but beyond a certain threshold, the relationship reverses. [Leuz et al. \(2003\)](#) also found that family firms engage in more REM to facilitate their private benefit consumptions specifically in countries with weak investor protection. They assumed that the regulatory framework, the level of investor protection, enforcement of legal codes and ownership concentration undertake an important role in family firms regarding their tendency to reduce/increase the REM ([Razzaque et al. 2020](#)). Findings are consistent with the work of [Claessens et al. \(2000\)](#); and [Fan and Wong \(2002\)](#), who discussed that non-family firms perform better than family firms as they are less likely to improve the financial information quality provided to minority shareholders. This indicates that the family firm is more exposed to expropriate minority shareholders to pursue their private benefits, thereby suffering from principle–principle conflict (Agency problem II).

However, the results shown in Tables 4–10 indicate a negative and significant relationship between family ownership and REM based on ABDISCX at a 1% significance level, while family ownership is non-significantly related to proxies of REM (ABPROD, RM2, and RM3). This finding is in accordance with [Achleintner et al. \(2014\)](#) in the German context, who found that family firms engage less in REM and engage more in AEM. Family-owned firms are more concerned with preserving the long-term prospects of their investments in

the firms and they are worried about negative future value implications. This is consistent with the views of [Cascino et al. \(2010\)](#); and [Wang \(2006\)](#), who found that family firms rather than non-family firms promote the integrity of financial reporting. These results are consistent with another strand of research such as the work of [Ghabdian et al. \(2012\)](#); [Usman and Yero \(2012\)](#); and [Halioui and Jerbi \(2012\)](#), who revealed that non-family firms engage in accruals EM more than family firms. [Siregar and Utama \(2008\)](#) found that family ownership negatively and significantly influences opportunistic EMs. It was found that ownership concentration in family firms increases the tendency to adopt efficient EM compared to non-family firms. Additionally, in the Malaysian context, [Ghaleb et al. \(2020\)](#) in their empirical study motivated and encouraged the role of family firms in eliminating the real activity manipulation and in enhancing the quality of financial reports. Their finding has been supported across different levels of family ownership concentration using different proxies of REM with different regression models. Similarly, [Al-Duais et al. \(2021\)](#) also supported the negative relationship between family owned and REM. Their findings support the alignment hypothesis, which supports the role of family firms in harmonizing between their interests with shareholders interests and in reducing REM practices from the agency perspective.

Interestingly, EM practice in family-owned firms is still an empirical issue due to the relative influence of entrenchment and alignment effects. Several studies on the family firms provided evidence that family ownership has a non-monotonic/nonlinear relationship with EMs either with DAs or REM due to the level of an equity stake ([Attia et al. 2022, 2023](#)). For instance, [Akimova and Schwödiauer \(2004\)](#); [Wang \(2006\)](#); and [Razzaque et al. \(2016\)](#) also revealed a non-linear/curve association between family firms and EMs. The lack of generalizability of the findings on earnings quality in family firms mostly revolves around accrual EM measures. However, there is evidence that EM is not limited to accruals management only, but may involve REM ([Graham et al. 2005](#); [Roychowdhury 2006](#); [Cohen et al. 2008](#); [Cohen and Zarowin 2010](#); [Gunny 2010](#); [Zang 2012](#)). These outcomes support partially (H2), which claims that the family-owned firm is significantly and negatively related to the extent to which REM is conducted.

With regard to the institutional ownership, the research hypothesis (H3) suggests that institutional ownership has a negative and significant impact on REMs. The SGMM results as shown in Tables 4–10 find a negative and significant relationship between institutional shareholding and REM based on (ABPROD, RM1, RM2, and RM3) at 1% significance level. There is a shred of substantial evidence documenting a negative association between institutional own and REM such as the work of [Park and Shin \(2004\)](#); [Aygun et al. \(2014\)](#); [Ayadi and Boujelbène \(2014\)](#); [Al-Zoubi \(2016\)](#); [Farouk and Bashir \(2017\)](#). It is noticed from the prior literature that there is a scarcity in the studies that examine the relationship between institutional ownership and REM. [Bushee \(1998\)](#) found a negative relationship between institutional ownership and the manager's tendency to cut R&D expenditures, but not for all types of institutions. [Roychowdhury \(2006\)](#) also revealed a negative relationship between institutional shareholding and REM based on (ABDISCX and ABPROD).

Subsequent studies such [Zang \(2012\)](#) also found that institutional shareholders exert more effort and pressure on the management to reduce REM more than AEM due to long term consequences of the REM. However, he stated that the institutions may not be able to prevent the incidence of REM if their shareholding is low. Moreover, [Kałdoński et al. \(2020\)](#) also reported that firms with more stable institutions are expected to engage participants in less sales manipulation or overproduction. However, [Bushee \(1998\)](#); [Koh \(2003\)](#); [Chen et al. \(2008\)](#); [Sakaki et al. \(2017\)](#) in the USA; [Mehrani Sasan and Eskandar \(2017\)](#) in Iran; and [Kałdoński et al. \(2020\)](#) in Poland found that the type of institutional ownership (e.g., time horizon, ownership concentration, and institutional stability) influences the likelihood of the management to conduct REM. These results imply that active and long-term oriented institutional ownership acts as a monitoring mechanism in preventing the wrongdoings in the process of financial reporting and in encouraging higher earnings quality. These results are consistent with RD Theory and efficient monitoring hypothesis, which suggest that

institutional owners secure necessary and scarce resources, opportunities and the ability to monitor, discipline and develop the managements' decisions more than individuals. [Lin and Hwang \(2010\)](#); [Farooq and El-Jai \(2012\)](#); and [Farouk and Bashir \(2017\)](#) discovered a negative and non-significant link between institutional ownership and earnings manipulation. As a result, they recommended raising the percentage of the institutional shareholding where the distribution of more shares as the negative sign is a sign that institutional investors could aid in justifying EMs.

On the other hand, the result from SGMM analysis also reports a positive and significant relationship between institutional ownership and REM based on the four models of REM (ABCFO) at 10%. This result is consistent with the study of [Bushee \(1998\)](#) who suggested that the institutional ownership with high ownership concentration and high turnover trading motivate myopic investment behavior and cut R&D expenditures for short term profitability. Similarly, [Siregar and Utama \(2008\)](#) for Indonesian firms, [Yang et al. \(2009\)](#); [Iqbal and Strong \(2010\)](#); [Abdul-Jalil and Abdul-Rahman \(2010\)](#); [Al-Fayoumi et al. \(2010\)](#) in Jordan; [Roodposhti and Chashmi \(2011\)](#) in Iran; and [Issarawornrawanich and Jaikengkit \(2011\)](#) in Thailand revealed a positive relationship between institutional ownership and EM. They argued that when institutions are short-term oriented, lack the expertise and knowledge or suffer from free-rider problems or strategically ally with the management, they do not monitor or control the management functions effectively due to low shareholding, or entrenchment hypothesis or the agency problem.

With regard to the governmental ownership, empirical and theoretical studies that paid attention to the relationship between state ownership and EMs (REM) is limited. Hypothesis (H4) predicts a positive link between the governmental ownership and REM using six models developed by [Graham et al. \(2005\)](#); [Roychowdhury \(2006\)](#); [Cohen and Zarowin \(2010\)](#). The results from SGMM reveal a positive and significant relationship link between government ownership and REM (ABPRO, ABDISCX, RM1, RM2, RM3) at 1% as proxies of EMs. It is widely expected that firms with further governmental ownership manipulate earnings more than privately owned firms due to the highly layered organizational hierarchy, bureaucratic interference, poor human resources polices, nepotism and lack of competition. In this case, managers have more opportunities to perform discretionary power in manipulating the financial reports. Agency problems in SOEs are more likely to increase more than in privately owned firms due to the conflicts of interest either between state and minority shareholders or between owners and managers. Consequently, there is no effective monitoring and control in SOE enterprises because oversight functions are often performed by a governmental official who acts as an agent of the state, leading to increased information asymmetry, multiple interest conflicts and agency problems ([Poli 2015](#); [Ben-Nasr et al. 2015](#); [Yasser et al. 2016](#)).

In contrast to a conventional belief regarding corporate inefficiency with state ownership, the results reveal a negative and significant relationship between government ownership and REM (ABFO) at 1%. The findings are in line with the work of [Ding et al. \(2007\)](#); [Wang and Yung \(2011\)](#) who revealed a negative link between REM and State shareholding. They found that state ownership plays a significant role in reducing abnormal accruals and enhancing accruals quality even after controlling tunneling. As the government works as a powerful external monitor protecting against managerial opportunism in state institutions. This forces the managers to reduce manipulating firm-specific information in state-owned organizations ([Capalbo et al. 2014](#); [Hoang et al. 2014](#)). Therefore, governmental ownership has a different effect on REM proxies due to the different proxies used for calculating REM. Overall, it can be concluded that very limited evidence was found regarding the impact of ownership structure (independent variable) and REM. Most of the sub-hypotheses formulated earlier were rejected due to either opposing coefficients or insignificance.

4.4. Robustness Check and Sensitivity Analysis

Several checks are performed to ensure the credibility of the primary findings. The main model with different proxies for REM reports the first set of tests, which includes the key results. In addition, we re-estimate our analyses using (FGLS analysis, pooled OLS with robust standard error, and fixed/random effect panel data analysis) to demonstrate the effect and consequences of the ownership structure on financial reporting and to determine whether there are contrasts in our results with respect to the period of examination.

Consistent with the main test, the FGLS analysis as shown in Table 11 reveals that the coefficient of managerial ownership is negative across five models of REM (ABCFO, ABPROD, ABDISCX, RM1 and RM3) as proxies of REM assuming that as the level of managerial ownership increases, the level of REM decreases. This results in contradicting the hypothesis, which suggests a positive and significant relation between managerial ownership and REM. In terms of family ownership, the results revealed from FGLS regarding the association between the proportion of family ownership and REM based on (ABCFO) is consistent with the main test. However, the results are not consistent with the main test regarding the coefficient and significance level based on (ABPROD, ABDISCX, RM1, RM2, RM3). FGLS reveals a lower significance level than SGMM analysis, but the directions in both analyses (coefficient) are quite similar. This supports the results regarding the significant role of institutional shareholders in reducing the real-based activity EMs. The results from FGLS support the results of the main test that governmental ownership has a positive impact on REM across the six models. However, the significance level in the main test (SGMM) is higher than the significance level of these variables in the (FGLS). This result is not consistent with the theme of Agency Theory, which suggests that lower opportunistic earnings manipulation is associated with the existence of government ownership (Habbash 2010).

Table 11. Summary of FGLS CG mechanisms and real-based activity EMs.

	Expected Sign	ABCFO	ABOPRO	ABDISX	RM1	RM2	RM3
Ownership structure							
Mag own	+	Negative and non-significant	Negative and significant at 1%	Negative and non-significant	Negative and non-significant	Positive and non-significant	Negative and non-sig
Fam Own	—	Positive and significant at 1%	Positive and non-significant	Positive and non-significant	Negative and non-significant	Negative and sig at 10%	Negative and non-sig
Inst Own	—	Negative and non-sig	Positive and non-significant	Negative and non-sig	Negative and non-significant	Negative and non-significant	Negative and non-sig
Gov Own	+	Positive and non-sig	Positive and non-significant	Positive and non-significant	Positive and non-significant	Positive and non-significant	Positive and non-significant

5. Summary and Conclusions

This study explored the connection between ownership characteristics and real-based activity management (REM) in the context of Egypt, using a sample of 780 firms from 2008 to 2017. The results indicate that current governance mechanisms, such as corporate governance practices and auditing, are not effective in reducing opportunistic behavior and improving the accuracy and credibility of financial reporting in Egypt. This could be due to a number of reasons, such as weak legal protection for minority shareholders, ineffective enforcement of laws and regulations, and a lack of disclosure and voluntary implementation of corporate governance practices.

The study also found that the relationship between corporate governance attributes and earnings management practices is non-significant. This could be due to the entrenchment-alignment hypothesis, which can make it difficult for linear models to provide a consistent correlation across different ownership structures. This leads to positive and negative slopes that cancel each other out, resulting in a zero coefficient and affecting the level of significance.

Given these findings, it is recommended that future research focuses on improving the enforcement of laws and regulations to protect minority shareholder rights, and exploring the impact of the surrounding environment, legal framework, political and statutory regulations, and cultural values on corporate governance practices in Egypt. It is also important to examine other internal governance attributes, as well as external governance mechanisms such as audit quality, in order to gain a more complete understanding of the relationship between ownership and REM.

Based on the study findings, some potential implications and policies have been suggested to enhance the quality of financial reporting; the organization should enhance the association between the interests of managers and their shareholders by providing them with incentive mechanisms such as bonuses, stock options, and stock awards to actively enhance the quality of financial information published to the shareholders. However, it is also critical to maximize the management shareholding to a certain limit, as the over maximization of management ownership may be harmful for the organization and give them more power, control and authority to maximize their benefits on the best interest of shareholders. In addition, the regulatory bodies could motivate the investors to invest more in the family firms rather than non-family firms due to their effectiveness in monitoring their management activities, and in avoiding any manipulating activities and in reducing any information asymmetric. Therefore, policy makers and regulators may consider these results as the ownership structure plays a critical role in shaping the governance of firms and in enhancing financial reporting quality. In addition, the regulatory bodies should devote more attention regarding the importance of ownership structure as an internal CG mechanism that can help alleviate the practices of profit management. They should focus on designing an appropriate model for different types of ownership structures according to different industry sectors.

However, there are limitations to this study. One potential limitation is that this study only considered a limited set of governance attributes, and did not account for other factors that could impact the relationship between ownership and REM. Additionally, different proxies of ownership with different investment horizons and strategies could also influence this relationship. This study focused only on non-financial sectors and can be extended in the future to include financial sectors.

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