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# Does ownership concentration matter for the relationship between CEO characteristics and real earnings management: evidence from Jordan

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## Abstract

**Purpose** – The current research inspects the moderation role of ownership concentration on chief executive officer (CEO) characteristics and real earnings management (REM) relationship in Jordan.
**Design/methodology/approach** – Driscoll–Kraay regressions were run using data from 348 firm-year observations for companies listed on the Amman Stock Exchange between 2013 and 2018.
**Findings** – Driscoll–Kraay regressions demonstrate that CEO experience, tenure and political connections improve REM practices. Ownership concentration diminishes and limits REM practices when combined with CEO experience, tenure and political connections, since all three have a negative and significant link with REM.
**Research limitations/implications** – Initial constraints include the study's lack of generalisability due to a small number of CEO-related parameters. Second, critics of the ideal model for judging EM have a foreseeable flaw. No generally accepted model is perfect.
**Practical implications** – This study's conclusions are crucial for industry participants, including companies, policymakers, investors and the general public. These findings will help investors, practitioners and regulators understand that businesses with significant ownership concentrations and experienced CEOs have superior earnings and low REM practises.
**Social implications** – The findings of this study have an optimistic impact on the existing body of knowledge. The current literature has yet to properly inspect the moderation role that ownership concentration has on the connotation between CEO characteristics and EM.
**Originality/value** – Despite several research studies in both developed and developing nations, ownership concentration has been almost virtually neglected. The current study could fill a hole in earlier research, rendering it a novel study.

**Keywords** Real earnings management, Ownership concentration, CEO characteristics, Jordan
**Paper type** Research paper

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## 1. Introduction

The failure of the respected companies, for instance, Enron, Arthur Andersen and WorldCom, has centered the world's attention on the probity of the financial reports as well as the efficiency of external and internal control procedures (Ghaleb *et al.*, 2021). Moreover, earnings management (EM) has been argued and investigated for a reasonable period, beginning with Watts and Zimmerman (1986). They developed the positive accounting theory underlying accounting technique choice (Siraji and Nazar, 2021).

Earnings are a crucial piece of information that shareholders use to make investment decisions. They are also a criterion for evaluating the performance of managers and a basis for deciding the amount of managers' remuneration to be paid. Accordingly, managers are incentivised to control earnings using various tactics and manipulations that can deceive investors about the quality of the firm's earnings (Indarti and Widiatmoko, 2021).

EM takes place if the managers deliberately alter their financial reporting in order to manipulate the perception of investors and other stakeholders to deceive or manipulate the financial reporting users' outcomes of their choices (Siraji and Nazar, 2021). In addition, in order to chase creative accounting while twisting financials in a preferable way for the stakeholders, real EM is considered a widespread engagement tool (Watts, 2003).

Real earnings management (REM), according to Roychowdhury (2006), is a technique for manipulating earnings through making suboptimal decisions by the managers on the timings and gauges of economic actions based on three precise operational activity measures. First, in order to accomplish short-term goals, managers plan to manipulate credit sales and price reduction policies. Customers' expectations of future discounts may be distorted due to these activities, and the margin of sales may decrease (Kim and Sohn, 2013).

The existing literature affords opposing interpretations of the motivations and ramifications of REM (Zang, 2012). Second, managers go above and beyond their steady production amplitude by increasing operational margins and declining sales costs. The increase in production, however, leads to higher inventory holding costs (Roychowdhury *et al.*, 2012). Third, managers misinterpret operational expenditures in order to raise the marginal returns on regular earnings. Nevertheless, it is convinced that the managerial practice of REM enhances existing period income.

The interconnection that exists between the corporate governance mechanisms and EM has primarily been investigated extensively through the use of research that incorporates variables, for instance, audit committee, the board size and audit firm (e.g. Abed *et al.*, 2012; Klein, 2002; Shen and Chih, 2007; Mohammad *et al.*, 2016). However, the connotation between financial reporting quality (FRQ) and chief executive officer (CEO) characteristics is still unclear. For instance, preceding studies that explored the association between CEO attributes and FRQ reported mixed results. As a result, academic scholars recommended that additional research be conducted to investigate whether or not CEO characteristics have an impact on financial statement fraud, such as REM (Altarawneh *et al.*, 2020). The existing literature suggests the idea that a variety of significant individual demographics may influence the connection between top management and fraud, including age, education level, years of experience and gender (Zahra, 2005; Hambrick, 2007; Greve *et al.*, 2010; Troy *et al.*, 2011; Schrand and Zechman, 2012).

Jensen and Meckling (1976) observed that if the ownership and control are separated, there will be a divergence in the follow-up of managerial and owners' interests. Stockholders who hold 5% or more of a company's outstanding stocks would have a stronger incentive to control managers' behaviour because such control would result in a larger share of advantages (Jensen and Meckling, 1976), such as providing the shareholders with high-quality financial reports. Consequently, the present study explores further the moderating impact of ownership (OC) concentration on CEOs' characteristics–REM relationship.

The literature has contrasting arguments about how OC affects earnings quality. According to the alignment effect, management may be dissuaded from manipulating earnings if shareholders and other principals have similar interests due to greater shareholdings (Tsao

*et al.*, 2019). Highly concentrated firms outperform those with less concentrated ownership because of the efficiency and effectiveness of their monitoring processes (Anderson and Reeb, 2003). Managers at companies with significant insider ownership are less expected to engage in EM as they place a premium on maintaining the company's good standing and financial stability (Martinez-Ferrero *et al.*, 2016; Alzoubi, 2016; Tsao *et al.*, 2019). Prior studies have reported a statistically negative relation between OC and REM (Usman and Yero, 2012; Guo and Ma, 2015; Al-Rassas and Kamardin, 2016; Abdallah and Ismail, 2017).

Conversely, the entrenchment premise suggests that governing stockholders may be tempted to tamper with the results at the expense of non-governing stockholders to boost their own wealth (Abdullah and Ismail, 2016; Shleifer and Vishny, 1997; Fama and Jensen, 1983). Moreover, managers might be highly driven to engage in EM because of the risk of unfavourable consequences from significant shareholders' deteriorating performance. Darmadi (2016) opines that firms with fewer owners are less possible to use EM techniques. In addition, extant studies find that OC encourages managers to practice EM techniques like REM (Liu and Lyu, 2016; Reyna, 2012; Al-Fayoumi *et al.*, 2010).

Jordan is an interesting context to conduct our study due to the following. First, in comparison to other countries, the REM issue in Jordan is critical and frightening (Kharashgah *et al.*, 2019). Enomoto *et al.* (2015) stated that using a sample of 38 countries, Jordanian corporations carry out REM activities at a higher percentage than those in other nations. Moreover, a study by Shakhatreh *et al.* (2020) reported disclosure violations in Jordan increased from 36% in 2010 to 44% in 2016. Furthermore, Al-Mousawi and Al-Thuneibat (2011), Al-Khabash and Al-Thuneibat (2008), and Almarayeh *et al.* (2020) have all found that EM practices are common among Jordanian listed companies. Moreover, numerous studies have shown a significant rise in EM practices in Jordanian listed firms (Abed *et al.*, 2012; Alzoubi, 2016; Abbadi *et al.*, 2016; Alqatamin *et al.*, 2017; Shahwan and Almubaydeen, 2020). Second, OC is quite common in Jordanian firms. Therefore, as a response to the call by the literature, the current research intends to obtain a profounder understanding of the connection between CEO attributes and EM in Jordan.

Although there are a few studies that examine the impact that CEO characteristics have on REM, the majority of this prior research has primarily been conducted in Western or relatively developed nations. Some examples of this prior research include Amirkhani *et al.* (2020), Chou and Chan (2018), and Cho *et al.* (2019). Moreover, the results of the studies are asserted, and there is no clear conclusion as to how CEO attributes may affect REM, for instance, Gounopoulos and Pham (2018), Chou and Chan (2018), Kouaib and Jarboui (2016), Hu *et al.* (2017), and Qi *et al.* (2018), Alhmood *et al.* (2020), Qawasmeh and Azzam (2020), Latif and Al-Dhamari (2020), Cho *et al.* (2019), Nuanpradit (2019), Alareeni (2018), Bataineh *et al.* (2018), Dinh *et al.* (2021). Our paper provides a unique contribution that some CEO characteristics increase the likelihood of the REM being practised in Jordan, a jurisdiction with weak investor preservation, poor corporate governance mechanisms and a great level of OC.

Furthermore, the existing body of research has not yet adequately investigated the aspect of OC as a moderator in the connection between CEO characteristics and REM. We participate in the existing line of research by taking OC into account as a moderator in the relationship to provide imperative insights regarding the influence of CEO characteristics and OC in an EM context. We found that OC is a vital aspect that should be considered when investigating the connotation between CEO attributes and REM.

As a result of this, the current study might be considered a novel study because it has the potential to address this gap in the previous research that has been conducted before. Upper echelons theory, which is used in this study, expands our understanding of how CEOs and other high-ranking executives' traits affect the values, policies and disclosure choices made by their organisations (Taleatu *et al.*, 2020). The results of this study also contribute to expanding our understanding of corporate governance and EM.

The remnant parts of our paper are organised as described here. The following section appraises the literature and develops the hypothesis. The next section gives details regarding the data, sample selection and research design. Section 4 shows the main results. This is followed by the presentation of further analysis and robustness tests in Section 5. While Section 6 provides a discussion and policy implications of the findings, Section 7 concludes the paper.

## 2. Literature review and hypothesis development

The CEO is generally regarded as the one who wields the most influence inside a company or organisation. All major business decisions are ultimately up to the CEOs in charge, such as the release of financial information, the board of directors' structure, etc. They are ultimately responsible for the company's results. CEOs are ultimately in charge of the superiority of the financial reporting as well as the firm's strategic operations (i.e. present and imminent performance) (Feng *et al.*, 2011). Owing to the obvious CEO's responsibility for the establishment's performance, the likelihood of a manager's EM may increase (Chou and Chan, 2018). Previous studies suggest that CEOs may have desires concerning REM.

The presence of REM in a firm's financial statements could conflict with the CEO's fiduciary responsibility to the firm's stakeholders, as well as degrades FRQ. Under the assumption that REM will negatively influence the company's upcoming performance, it may also influence management's ability to act as a CEO (Francis *et al.*, 2008; Bhojraj *et al.*, 2009; Kim *et al.*, 2020).

The attributes of a company's CEO may have a substantial effect on FRQ. CEOs can use their financial knowledge and expertise to understand better financial and accounting issues (Gounopoulos and Pham, 2018). Because of limited studies on how much CEOs engage in EM, the effects of CEO characteristics are still understudied. There has not been enough investigation into how CEO demographics affect the organisation's financial reporting strategies.

### *2.1 CEO characteristics and REM*

*2.1.1 CEO experience.* The theory of the upper echelons has received plenty of consideration. The core clue of this theory is that the entity is a reflection of its chief executive's personality (Hambrick and Mason, 1984). According to this theory, CEOs' strategic decisions are affected by their characteristics, professional backgrounds and personal values (Hambrick, 2007). In addition, CEO experience is defined as the number of CEOs who worked in several roles and positions before becoming CEOs (Wang *et al.*, 2016). Accordingly, CEOs bring to the CEO position their orientations and perspectives based on their experiences. CEOs who have accumulated a wealth of knowledge and expertise throughout their career can use this knowledge to make better accounting decisions and improve reporting (Gounopoulos and Pham, 2018). According to Matsunaga and Yeung (2008), Troy *et al.* (2011), Jiang *et al.* (2013), Ran *et al.* (2015), Kouaib and Jarboui (2016), Li *et al.* (2016), Gounopoulos and Pham (2018), and Chou and Chan (2018), CEOs who have prior experience in the financial field are less probable to involve in EM.

In contrast, the findings of Kouaib and Jarboui (2016), Hu *et al.* (2017), and Qi *et al.* (2018) discovered that CEOs with prior experience in the financial field are more prospective to engage in REM. Recently, Amirkhani *et al.* (2020) and Alhmood *et al.* (2020) revealed that CEOs with more experience could manage their earnings, as evidenced by previous executive positions.

It is clear from the preceding discussion that there is no agreement concerning the connotation of CEO experience and EM. However, the popularity of former literature inspected the impact of CEO experience on EM, particularly in the Jordanian context, using accrual-based EM as a measurement, such as Al-Fayoumi *et al.* (2010), Abed *et al.* (2012), Alzoubi and Selamat (2012) and Alzoubi (2016). As a result, the current research attempts to fill this gap by using REM as a stand-in for the measurement of EM practises. Building on these studies, our paper premises the following hypothesis.

*H1.* A positive and significant relationship exists between CEO experience and REM for Jordanian listed firms.

*2.1.2 CEO tenure.* CEO tenure is one of the furthermost investigated CEO attributes among upper echelons theory research (Finkelstein *et al.*, 2009; Wang *et al.*, 2016). According to upper echelons theory documents, longer-serving CEOs are less able to take strategic actions. For example, according to Hambrick and Fukutomi (1991), CEOs who have been in their positions for many years tend to become more focused on a single paradigm and lose their ability to be flexible, open-minded and engaged in their work.

It is widely debated whether there is a link between CEO tenure and the extent of earnings manipulations. Some scholars show that EM is superior in the initial years of CEO serving than in the later years (Qawasmeh and Azzam, 2020). Furthermore, some argue that a long-tenured CEO accumulates sufficient business knowledge and experience over their extended years of service and thus is expected to enhance firm performance through effective management (Falato *et al.*, 2011; Wang *et al.*, 2016). Furthermore, Cornett *et al.* (2008), Kuang *et al.* (2014), Ali and Zhang (2015), Chou and Chan (2018), and Sani *et al.* (2020) discovered that EM is lower in the latter years of a CEO's tenure.

On the contrary, long-tenured CEOs familiar with corporate business operations are expected to be involved in EM practises to disclose higher earnings and achieve their goals of growing the firm performance (Wang *et al.*, 2016). Furthermore, Cho *et al.* (2019) and Ghosh and Moon (2005) documented a positive connection between EM and CEO tenure.

Even though the influence of CEO tenure on EM has been extensively studied, the findings have been mixed. Thus, the absence of studies that associate the CEO tenure with REM and the variability of the results on this problem prompted this investigation. Accordingly, the results of the present research add to the body of knowledge by providing further evidence for the existence of such a connection.

The current study, however, follows the previous literature's perspective that the CEO is highly expected to engage in REM in the initial years of a CEO's tenure. As a result, the following hypothesis is premised.

*H2.* A negative and significant relationship exists between CEO tenure and REM for Jordanian listed firms.

*2.1.3 CEO duality.* The duality of the CEO indicates a management structure in which the CEO of a corporation is, at the same time, the Chairman of the Board (Coombes and Wong, 2004). Whether CEO duality increases or decreases EM practices has long been debated. According to agency theory, chairman and CEO's duties should be divided to improve management oversight (Jensen, 1993). Because the board's responsibilities include administration and supervision of management, the agency theory proposes that the CEO and the chairman's positions should be disconnected (Yunos, 2011).

Furthermore, due to his dominance on the board, duality can allow the CEO to take opportunistic action (Barako *et al.*, 2006; Alsraheen and Saleh, 2017). As a consequence of this, it is proposed that the duties of chairman and CEO be segregated in order to prevent a significant concentration of power from occurring when the same person fulfils both functions (Cadbury, 1992).

Previous research has not reached a consensus on the association of CEO duality and EM. For instance, Yasser and Al Mamun (2015), Alsraheen and Saleh (2017), and Chelogoi (2017) discovered a negative link between CEO duality and EM practices. Conversely, O'Connor *et al.* (2006), Gulzar and Zongjun (2011), Chi *et al.* (2015), Iraya *et al.* (2014), and Azeez *et al.* (2019) conclude that CEO duality increases the possibility of EM increasing CEO compensation.

Furthermore, Nuanpradit (2019) reported that CEO duality is positively linked with REM practices. On the contrary, Alareeni (2018) and Bataineh *et al.* (2018) suggest that CEO duality

has no impact on EM practices. As a result, there is no conclusion that can be considered conclusive to the question of how the dual role of CEO affects EM procedures. Because of this, the current study places a strong emphasis on the connection between CEO duality and REM in the hopes of obtaining some additional evidence concerning this connection so as to fill a gap in the existing body of literature.

In agreement with the proposed agency theory and the perspective provided by the previous research, the general conclusion is that the separation of duties between the chairman and CEO can lead to more efficient management governing and fewer REM practices. As a result, the current study proposes the following hypothesis.

*H3.* A positive and significant relationship exists between CEO duality and REM for Jordanian listed firms.

*2.1.4 CEO politically connected.* Based on Faccio (2010), a corporation is considered politically connected if "at least one of its large shareholders (anyone controlling at least 10% of voting shares) or one of its top officers (CEO, president, vice-president, chairman or secretary) is a member of parliament, a minister or is closely related to a prominent politician or political party."

In this context, agency theory posits that CEOs with political Allies are more likely to use their positions to further the interests of those Allies rather than the stockholders. According to Dinh *et al.* (2021), politically connected CEOs can be very advantageous for firms. First, possessing politically connected CEOs may aid access to crucial information on regulatory vicissitudes at an initial phase. This will enable them to make decisions regarding strategies to ensure the pursuit of the firm's goals.

Politically connected companies, on the other hand, appear to be more likely to use EM strategies to conceal the advantages they generally possess from their links, particularly those of uncertain legality (Braam *et al.*, 2015; Chaney *et al.*, 2011; Faccio, 2006; Faccio *et al.*, 2006; Watts and Zimmerman, 1990). Chaney *et al.* (2011) found that politically related firms consistently reported lower-quality accounting information than politically unconnected firms.

Furthermore, Chi *et al.* (2016) observed that organisations with politically connected CEOs have meaningfully higher REM practices. Moreover, Braam *et al.* (2015) argued that because REM is more secretive and has the adequacy to conceal political favours rather than accrual EM, politically connected companies are highly possible to practise REM. Similarly, Al-Sraheen and Alkhatib (2016) found that top management's political connections are positively associated with EM. In the same way, Zhang and Truong (2019) found a positive link between politically connected executive directors and EM practises.

While some studies have identified that politically connected CEOs can have a detrimental effect on EM (Chaney *et al.*, 2011; Chi *et al.*, 2016; Al-Dhamari and Ismail, 2015), others have discovered no link between political connections and accounting practices. For instance, Yen (2013) examined companies based in China and discovered no correlation between political ties and EM. In conclusion, there is a paucity of previous literature that conducts research into the connection between political connections held by CEOs and EM, and the findings of these studies are contradictory. As a result, the purpose of the present study is to further explore this relationship in order to address this gap in the previous research.

Despite the lack of conclusive evidence in the prior literature, regarding the connotation between the CEO's political connections and REM practices, the current literature, which is guided by agency theory, adopts that the CEO's political connections will increase REM practices. Hence, the following hypothesis was developed in this study.

*H4.* A positive and significant relationship exists between the politically connected CEO and REM for Jordanian listed firms.

*2.2 The moderating role of ownership concentration*

On the basis of agency theory, separating ownership and control has led to a struggle of interest between managers and owners (Jensen and Meckling, 1976). There are two possible ways through which large shareholders can impact the performance of a company and the rights of minority shareholders. The first way is positive, in which large shareholders guard the interests of minority shareholders. The second way is that large shareholders and managers conspire to gain benefits for themselves, regardless of the impact on smaller shareholders (Ghaleb *et al.*, 2020).

Recent research has highlighted the prominence of FRQ in the presence of concentrated ownership (Ghaleb *et al.*, 2020; Durendez and Madrid-Guijarro, 2018; Lin and Shen, 2015; Zang, 2012). Regarding the association between OC and REM, some researchers have found that OC, for example, is negatively associated with EM (Guo and Ma, 2015; Al-Rassas and Kamardin, 2016; Abdallah and Ismail, 2017; Usman and Yero, 2012). Studies suggest that OC can reduce agency costs and, as a result, mitigate EM practices by increasing control and alleviating free-riding issues (Shleifer and Vishny, 1997; Demsetz and Lehn, 1985). This is due to the fact that large shareholders could exert influence over managerial behaviour, thereby reducing the likelihood of EM opportunities. Alves (2012) opines that with more long-term-oriented investors, there is less burden on the company's management to meet short-term earnings expectations.

In contrast, preceding studies have found that concentrated ownership induces managers to engage more in EM (Lyu *et al.*, 2017; Reyna, 2012; Al-Fayoumi *et al.*, 2010). This is due to the fact that managers of companies with large stockholders may face increased pressure to alter earnings, particularly when their businesses are underperforming (Morphi, 2015). Moreover, agency theory contends that increased concentration of ownership may give large shareholders' self-interest precedence, resulting in an indirect expropriation of firm resources (Jenson and Meckling, 1976). The idea is that a large shareholder can exert pressure on managers to use earnings manipulation as a tool to increase a firm's market value. Because of this uneven load, managers will use EM (Usman and Yero, 2012).

In sum, when a company's OC gets to a point where a single owner wields significant influence over the company, EM may be used by the controlling shareholders to extort minority shareholders' rights (Chan *et al.*, 2007). In contrast, increasing the largest shareholder's ownership could reduce the agency's costs and, consequently, the need for earnings manipulation to alleviate contractual constraints. Unlike other developing countries, Jordan has high OC, and controlling owners are more motivated to indulge in EM (Alzoubi, 2016). According to Almasarwah (2015), 85% of Jordanian industrial firms had block ownership.

Based on earlier debates regarding the effect of ownership concentration on EM practises, there are no conclusive answers addressing this association, as the results of previous studies are conflicting. In addition, the prior work neglected to investigate the effect of ownership concentration on the relationships between CEO attributes and EM practises. To fill the gaps in the prior literature, the current study is driven to evaluate the moderating influence of ownership concentration on the correlations between CEO characteristics and REM practises. Given the contradictory arguments concerning OC, the following hypothesis about the moderating aspect of OC are presented:

*H5.* Ownership concentration moderates the relationship between CEO characteristics and REM for Jordanian listed firms.

The following Table illustrates all the hypotheses premised in the current study (see Table 1).

The following figure presents the framework of the current study which summarises the logical process and research design (see Figure 1).

## 3. Research design

### *3.1 Sample structure and data collection*

Amman Stock Exchange (ASE) has 96 firms in the financial sector, 49 in the industrial sector and 47 in the service sector. The current study focused solely on the industrial and service sectors. From 2013 to 2018, this resulted in 570 firm-year observations. The study period was chosen because Jordan implemented the most recent version of the code of corporate governance, which was issued in 2012. Since the financial industry is governed by the Central Bank of Jordan and Insurance Commission, it was not involved in the current study.

In addition, companies that do not have the cost of goods sold and inventories, in addition to companies with missing crucial data, were uninvolved in the study because these firms do not have sufficient data required to compute the proxies of REM. The final sample of 43 industrial and 15 service companies gave a total of 348 firm-year observations (58 firms multiplied by six years). However, the two sectors that are included in this study make up 50% of the firms listed on ASE. So, the current study's final sample is sufficient to test the study's hypothesis.

Furthermore, we used a quantitative analysis based on the value-relevance study (Biancone *et al.*, 2016; Cardamone *et al.*, 2012) to evaluate our hypothesis. Using this analysis, we may determine what data are necessary to test the hypotheses. However, in order to ensure that the methodology is fairly appropriate to test the hypotheses of the study, the current study followed the methodologies used in earlier studies such as Amirkhani *et al.* (2020), Chou and Chan (2018), Cho *et al.* (2019), Gounopoulos and Pham (2018), Chou and Chan (2018), Kouaib and Jarboui (2016), Hu *et al.* (2017), Qawasmeh and Azzam (2020), Cho *et al.* (2019), Nuanpradit (2019), Alareeni (2018), Bataineh *et al.* (2018) and Dinh *et al.* (2021).

The data that were used in this study were considered secondary data. To accomplish this study's goal, the data corresponding to CEO characteristics, OC, REM and control variables

| | |
|---|---|
| H1 | A positive and significant relationship exists between CEO experience and REM for Jordanian listed firms |
| H2 | A negative and significant relationship exists between CEO tenure and REM for Jordanian listed firms |
| H3 | A positive and significant relationship exists between CEO duality and REM for Jordanian listed firms |
| H4 | A positive and significant relationship will exist between the politically connected CEO and REM for Jordanian listed firms |
| H5 | Ownership concentration moderates the relationship between CEO characteristics and REM for Jordanian listed firms |

**Table 1.**
Hypotheses summary

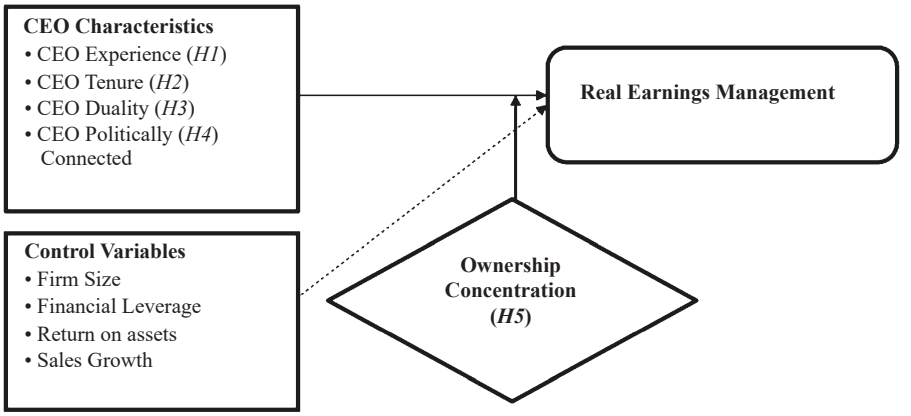



**Figure 1.**
Study framework

were manually extracted from the annual reports and company websites. The annual report can be obtained on the websites of both the firm in question and the ASE. The annual report was used as the core source of data for this study. Also, STATA was used as the statistical software to analyse the current study's data.

Table 2 details the number of service and industrial firms listed in ASE and those used by the current study.

*3.2 Variables measurement*

*3.2.1 Real earnings management.* In this research, the REM model was used to reveal how managers distort real activities. The REM measurement, devised by Roychowdhury (2006), shows the financial effects of purposefully changing real activity. Based on past work (e.g. Cohen and Zarowin, 2010; Cohen *et al.*, 2008; Gunny, 2010; Roychowdhury, 2006; Zang, 2012), three models were considered in REM level detection as follows: abnormal levels of cash flows from operations; production costs and discretionary expenses.

As stated by Zang (2012), managers participated in inventory overproduction to reduce the cost of goods sold by increasing their surplus investment. With the goal of increasing earnings, managers may also exercise their discretion to cut back on expenses that are considered to be discretionary. This study measured REM by using Zang's (2012) model, which measures REM by using abnormal production costs, which is the increase in the income costs by reducing overproduction costs for inventory and abnormal discretionary expenses, which is a decrease in discretionary expenditures that included administrative costs, advertising, sales, and research and development expenditures.

Furthermore, REM was calculated by estimating the residual values of PROD and DISEXP for each year and industry. The model is detailed in the following:

$$\mathrm{COGS}_{it}/\mathrm{Assets}_{it-1=}\alpha_0 + \alpha_1[1/\mathrm{Assets}_{it-1}] + \beta[\mathrm{Sales}_{it}/\mathrm{Assets}_{it-1}] + €_{it} \quad (1)$$

Then, the following is an estimation of the changes in inventory:

| Sector | Number of firms | Final sample |
|---|---|---|
| Service | | |
| Health care services | 4 | 2 |
| Educational services | 6 | 0 |
| Hotels and tourism | 9 | 5 |
| Transportation | 10 | 2 |
| Technology and communication | 2 | 1 |
| Media | 1 | 1 |
| Utilities and energy | 4 | 3 |
| Commercial services | 11 | 1 |
| Total | 47 | 15 |
| Industrial | | |
| Pharmaceutical and medical Industries | 4 | 4 |
| Chemical industries | 8 | 5 |
| Paper and cardboard industries | 1 | 1 |
| Food and beverages | 9 | 9 |
| Tobacco and cigarettes | 2 | 2 |
| Mining and extraction industries | 10 | 10 |
| Engineering and construction | 7 | 7 |
| Electrical industries | 3 | 3 |
| Textiles, leathers and clothing | 5 | 2 |
| Total | 49 | 43 |

**Table 2.**
Number of firms by sector

$$\Delta \text{Inv}_{it}/\text{Assets}_{it-1=}\alpha_0 + \alpha_1[1/\text{Assets}_{it-1}] + \beta_1[\text{Sales}_{it}/\text{Assets}_{it-1}] + \beta_2[\Delta\text{Sales}_{it}/\text{Assets}_{it-1}] + €_{it} \quad (2)$$

where:

$\Delta$Inv = the changes in inventory during the period t.

Via equations (1) and (2), a normal level of production looks like this:

$$\text{PROD}_{it}/\text{Assets}_{it-1} = \alpha_0 + \alpha_1\,[1/\text{Assets}_{it-1}] + \beta_1\,[\text{Sales}_{it}/\text{Assets}_{it-1}] + \beta_2\,[\Delta\text{Sales}_{it}/\text{Assets}_{it-1}] + \beta_3\,[\Delta\text{Sales}_{it-1}/\text{Asset}_{it-1}] + €_{it} \quad (3)$$

where:

PROD = sum of the cost of goods sold during year $t$ and the change in inventory from the previous year ($t-1$) to the current year ($t$).

$\text{Assets}_{it-1}$ = the total assets in the previous year ($t-1$).

$\text{Sales}_{it}$ = the net sales in the current year ($t$).

$\Delta\text{sales}_{it}$ = the change in the net sales from the previous year ($t-1$) to the current year ($t$).

As stated above, the measurement of PROD (abnormal production cost level) is the residual of equation (3). The higher PROD indicates real activity manipulation through overproduction, resulting in a reduction in the cost of goods sold.

Moreover, following Zang (2012), the normal level of discretionary expenditure is estimated as follows:

$$\text{DISEXP}_{it}/\text{Assets}_{it-1} = \alpha_0 + \alpha_1(1/\text{Assets}_{it-1}) + \beta_1(\text{Sales}_{it-1}/\text{Assets}_{it-1}) + €_{it} \quad (4)$$

where:

$\text{DISEXP}_{it}$ = the sum of selling, general, and administration expenses in year $t$.

$\text{Assets}_{it-1}$ = the total assets in the previous year ($t-1$).

$\text{Sales}_{it}$ = the net sales in the current year $t$.

$\Delta\text{sales}_{it}$ = the change in net sales from the previous year $t-1$ to the current year ($t$).

The estimated residuals from the regression are used to measure abnormal discretionary expenditures (DISEXP). The residuals were multiplied by $-1$ to be mathematically in the same direction as PROD, to the extent that larger values suggest that corporations deducted higher expenditures to boost earnings.

In the current study, the REM is computed as the accumulated measure of real activity manipulation. This figure is arrived at by multiplying the abnormal discretionary expenses (DISEXP) by a factor of minus one and adding the figure for the abnormal production costs (PROD) (Zang, 2012). According to Zang (2012), the component of abnormal cash flows from operations must be excepted from the three proxies (cash flow from operations, production costs, and discretionary expenses). This is due to the fact that abnormal cash flow activities have varying effects, and the net effect in determining REM is ambiguous.

*3.2.2 The independent variables, moderator variable and control variables.* While the prior subsection discusses the measurement of dependent variables, the current subsection discusses

the measurement of the employed independent variables in the existing paper in detail. The study measures CEO experience (CEOEXP) as the number of executive positions (inside or outside the company) that the CEO has held before becoming the CEO, following the study by Zouari *et al.* (2012). We measure CEO tenure (CEOTEN) as the number of years of serving as CEO following the study of Francis *et al.* (2008). Furthermore, CEO duality (CEODTY), in our paper, is measured as a dummy variable which is equal to 1 if the CEO and Chairman are the same person, and 0 if otherwise, following the study of Plöckinger *et al.* (2016). The political connection of the CEO (CEOPOL), in our paper, is measured following the study of You and Du (2012), i.e. as a dummy variable equal to 1 if the CEO was politically connected (the CEO is considered as politically connected if the CEO is a member of national parliaments or governments) and 0 if otherwise.

In this study, the moderating variable, ownership concentration (OWNCON) is measured as a percentage of shareholders owning more than 5% of all outstanding shares at the end of the calendar year, as suggested by Alhadab *et al.* (2020) and Alhababsah (2019). Besides the explanatory variables, we included control variables, namely firm size (FSIZE), leverage (LEV), sales growth (SGRWTH) and return on assets (ROA), that are found to impact REM. Table 3 affords a summary of the variables' measurements that were involved in this study.

## 4. Empirical model

The connotation between the CEO characteristics and REM, as well as the moderating impact of OC, was investigated in the current study. Numerous diagnostic tests were employed first on the attained data for this purpose. These tests consist of heteroscedasticity, multicollinearity and autocorrelation within panel data. Heteroscedasticity was discovered

| Variables | Measurement | References |
|---|---|---|
| Dependent variable (REM) | REM = PROD + DISEXP * −1 | Roychowdhury (2006), Zang (2012) |
| Independent variables | | |
| CEO experience (CEOEXP) | Number of executive positions (inside or outside the company) that the CEO has held in before becoming the CEO | Francis *et al.* (2008) |
| CEO tenure (CEOTEN) | Number of years of service as CEO | Francis *et al.* (2008) |
| CEO duality (CEODTY) | 1 if the CEO and Chairman are the same people, and if otherwise 0 | Plöckinger *et al.* (2016) |
| CEO politically connected (CEOPOL) | 1 if the CEO was politically connected (CEO will be considered as politically connected if the CEO is a member of national parliaments or governments) and if otherwise 0 | You and Du (2012) |
| Moderator variable | | |
| Ownership concentration (OWNCON) | Percentage of shareholders owning more than 5% of all outstanding shares at the end of the year | Alhadab *et al.* (2020), Alhababsah (2019) |
| Control variables | | |
| Firm size (FSIZE) | The natural logarithm of total assets | Nagy (2005), Abbott *et al.* (2006) |
| Financial leverage (LEV) | The ratio of total debt to total assets | Mao *et al.* (2017) |
| Sales growth (SGRWTH) | Annual sales growth (current year sales – prior year's sales)/prior year's sales | Al-Rassas and Kamardin (2016), Al-Absy *et al.* (2019) |
| Return on assets (ROA) | The results of net income divided by total assets | Alzeban (2019), Nawaiseh (2016) |

**Table 3.**
Table of measurements

in the data, and thus, as recommended by Hoechle (2007), the study used Driscoll–Kraay regression to correct the heteroskedasticity problem.

Furthermore, this study followed earlier research that employed the winsorization method to tackle normality problems (e.g. Kothari *et al.*, 2005; Saleh *et al.*, 2005; Brown and Caylor, 2006; Cohen *et al.*, 2008; Gaio, 2010; Kraft *et al.*, 2014; Talbi *et al.*, 2015). To avoid the effect of outliers within the distribution, variables with unusual observations and extreme values such as DISEXP, LEV, ROA and SGROWTH were winsorized at the 3rd and 97th percentiles. To meet the goals of the study, the current study came up with the following two models:

$$\begin{aligned}\text{REM} = {} & \beta_0 + \beta_1 \text{CEOEXP}_{\text{it}} + \beta_2 \text{CEOTEN}_{\text{it}} + \beta_3 \text{CEODTY}_{\text{it}} + \beta_4 \text{CEOPOL}_{\text{it}} \\ & + \beta_5 \text{FSIZE}_{\text{it}} + {}_{\text{it}} + \beta_6 \text{LEV}_{\text{it}} + \beta_7 \text{ROA}_{\text{it}} + \beta_8 \text{SGRWTH}_{\text{it}} + \text{YEAR DUMMIES} \\ & + \varepsilon_{\text{it}}\end{aligned} \tag{5}$$

$$\begin{aligned}\text{REM} = {} & \beta_0 + \beta_1 \text{CEOEXP}_{\text{it}} + \beta_2 \text{CEOTEN}_{\text{it}} + \beta_3 \text{CEODTY}_{\text{it}} + \beta_4 \text{CEOPOL}_{\text{it}} \\ & + \beta_5 \text{OWNCON}_{\text{it}} + \beta_6 \text{CEOEXP}_{\text{it}} * \text{OWNCON}_{\text{it}} + \beta_7 \text{CEOTEN}_{\text{it}} * \text{OWNCON}_{\text{it}} \\ & + \beta_8 \text{CEODTY}_{\text{it}} * \text{OWNCON}_{\text{it}} + \beta_9 \text{CEOPOL}_{\text{it}} * \text{OWNCON}_{\text{it}} + +\beta 10 \text{FSIZE}_{\text{it}} \\ & + \text{it} + \beta 11 \text{LEV}_{\text{it}} + \beta 12 \text{ROA}_{\text{it}} + \beta 13 \text{SGRWTH}_{\text{it}} + \text{YEAR DUMMIES} + \varepsilon \text{it}\end{aligned} \tag{6}$$

## 5. Regression results and model selection

To test the research hypotheses, this section presents the regression result on the effect of CEO attributes and REM as well as the moderating role of ownership concentration. Driscoll–Kray robust standard error was employed to avoid biased statistical inference and to cushion the effect of autocorrelation and cross-sectional dependency in the dataset. Hoechle (2007) suggests that erroneously ignoring cross-sectional correlation in the estimation of panel data can lead to severely biased statistical results. Hence, our study employed the Driscoll–Kray standard error in testing the research hypotheses.

### *5.1 Descriptive statistics*

Table 4 shows the descriptive statistics for the employed variables in the analyses. The results of the table revealed that REM ranged from −0.781 to 0.452, possessing a mean of zero. Furthermore, Table 4 demonstrates that the average experience of the CEO is 0.98, with a maximum value of 4 and a minimum value of 0, indicating that the CEO holds, on average, one executive position before being the CEO in the sampled firms. Moreover, the results show the average tenure of the CEO is almost 10 years, with a maximum value of 54 years and a minimum value of 1 year.

Furthermore, the results shown in Table 4 exposed that the average figure for CEO duality is 0.118, and the maximum value is 1 and 0 as the minimum value. Besides, the CEO's political connections average is 0.069, with 1 maximum value and 0 minimum value. Further, the results presented that the average of OWNCON is 0.635, the maximum value is 0.101 and the minimum value is 0.987.

Additionally, the natural logarithm of firm size was scored with a mean value of 17.144, a maximum value of 20.904 and a minimum value of 13.14. Furthermore, the average leverage is 0.371, the maximum is 0.936 and the minimum is 0.038. The ROA average is 0.019, with a

| Variable | Obs | Mean | Std. dev. | Min | Max |
|---|---|---|---|---|---|
| REM | 348 | 0.000 | 0.175 | −0.781 | 0.452 |
| CEOEXP | 348 | 0.980 | 1.145 | 0 | 4 |
| CEOTEN | 348 | 9.764 | 9.257 | 1 | 54 |
| CEODTY | 348 | 0.118 | 0.323 | 0 | 1 |
| CEOPOL | 348 | 0.069 | 0.254 | 0 | 1 |
| FSIZE | 348 | 17.144 | 1.411 | 13.14 | 20.904 |
| OWNCON | 348 | 0.635 | 0.233 | 0.101 | 0.987 |
| LEV | 348 | 0.371 | 0.233 | 0.038 | 0.936 |
| ROA | 348 | 0.019 | 0.083 | −0.161 | 0.265 |
| SGRWTH | 348 | −0.028 | 0.265 | −0.618 | 0.775 |

**Note(s):** REM = Real Earning Management, CEOEXP = CEO experience, CEOTEN = CEO tenure, CEODTY = CEO duality, CEOPOL = CEO politically connected, OWNCON = ownership concentration; FSIZE = firm size, LEV = leverage, ROA = return on assets; SGRWTH = sales growth

**Table 4.**
Descriptive statistics

maximum value of 0.265 and a minimum value of −0.161. Finally, the results show that the average sales growth rate is −0.028, with a maximum of 0.775 and a minimum of −0.618.

*5.2 Correlation analysis*

The Pearson correlations of REM, CEO characteristics, OC and the control variables are obtainable in Table 5. According to the figures offered in Table 5, the highest correlation (i.e. 0.326) is between sales growth (SGRWTH) and ROA. The results suggest no high correlation exists between all the variables tested, particularly CEO characteristics. This finding is consistent with the assumptions of Gujarati and Porter (2009), who proposed that the correlation matrix should have a maximum of 80% overlap to avoid self-association issues. To put it another way, the current study is free of serious multicollinearity issues.

*5.3 Regression results and discussions*

*5.3.1 CEO characteristics and REM.* The obtained results of the regression with Driscoll–Kraay standard errors are offered in Table 6. According to the findings, the model is fit and significant at the level of 0.01. Moreover, the model has an $R^2$ value of 0.1584. This means that the regression equation can be used to describe the difference in EM using statistics.

As presented in Table 6, CEO experience is significantly associated with REM with a positive coefficient of 0.032 ($t = 10.000$, $p < 0.01$). So, H1 is accepted. The result indicated that experienced CEOs are incentivised to engage in REM to gain upward short-term earnings and attain a favourable reputation. Therefore, they are able to make use of the accomplished professionalism and ability that they have achieved throughout the period of serving as executives to interfere with and alter the accounting information that is included in a financial report. The finding is in tandem with the upper echelons theory's notion that CEOs with more experience are more likely to take risks and engage in REM than their less experienced counterparts. The results are also in line with the study of Kouaib and Jarboui (2016), who found a positive and significant association between CEO experience and REM.

Moreover, Table 6 presented a significant positive connotation between CEO tenure and REM with a coefficient value of 0.001 ($t = 2.320$, $p < 0.1$). So, H2 is not supported as the hypothesis anticipated a negative association between CEO tenure and REM. However, this result is harmonised with the study of Sani *et al.* (2020), who reached a similar conclusion. Also, the result fits with the upper echelon theory, which says that the length of time a CEO has been in charge should affect the kind of decisions they make. This is because longer tenure gives CEOs more experience, which makes it more likely that they can manage REM.

**Table 5.**
Correlations

| | REM2 | CEOEXP | CEOTEN | CEODTY | CEOPOL | OWNCON | FSIZE | LEV | ROA | SGRWTH |
|---|---|---|---|---|---|---|---|---|---|---|
| REM | 1 | | | | | | | | | |
| CEOEXP | 0.102 | 1 | | | | | | | | |
| CEOTEN | −0.021 | −0.209** | 1 | | | | | | | |
| CEODTY | −0.198** | 0.053 | 0.076 | 1 | | | | | | |
| CEOPOL | 0.099 | −0.174** | −0.010 | 0.182** | 1 | | | | | |
| OWNCON | −0.156** | 0.128* | −0.195** | −0.064 | −0.202** | 1 | | | | |
| FSIZE | −0.054 | 0.085 | 0.141** | −0.134* | −0.128* | 0.047 | 1 | | | |
| LEV | 0.084 | 0.006 | −0.071 | −0.219** | 0.026 | −0.045 | 0.371** | 1 | | |
| ROA | −0.283** | 0.170** | 0.027 | 0.147** | −0.151** | 0.120* | 0.082 | −0.332** | 1 | |
| SGRWTH | −0.104 | 0.151** | −0.055 | −0.086 | −0.160** | 0.125* | 0.141** | 0.091 | 0.326** | 1 |

**Note(s):** REM = Real Earning Management, CEOEXP = CEO experience, CEOTEN = CEO tenure, CEODTY = CEO duality, CEOPOL = CEO politically connected, OWNCON = ownership concentration; FSIZE = firm size, LEV = leverage, ROA = return on assets; SGRWTH = sales growth

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

**Table 6.**
Results of the regression with Driscoll–Kraay standard errors (CEO characteristics and REM)

| Variables | Expected sig. | Coef. | *t*-value | *p*-value |
|---|---|---|---|---|
| CEOEXP | + | 0.032 | 10.000 | 0.000*** |
| CEOTEN | – | 0.001 | 2.320 | 0.068* |
| CEODTY | + | −0.119 | −13.930 | 0.000*** |
| CEOPOL | + | 0.082 | 2.130 | 0.087* |
| FSIZE | ± | −0.007 | −1.330 | 0.240 |
| LEV | ± | −0.018 | −0.520 | 0.628 |
| ROA | ± | −0.578 | −6.740 | 0.001*** |
| SGRWTH | ± | −0.027 | −0.860 | 0.427 |
| Constant | | 0.119 | 1.330 | 0.240 |
| Number of obs | | 348 | | |
| *R*-squared | | 0.1584 | | |
| Prob > *F* | | 0.000 | | |

**Note(s):** ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
REM = Real Earning Management, CEOEXP = CEO experience, CEOTEN = CEO tenure, CEODTY = CEO duality, CEOPOL = CEO politically connected, FSIZE = firm size, LEV = leverage, ROA = return on assets; SGRWTH = sales growth

Moreover, Table 6 discovered that CEO duality is significantly and negatively associated to REM with a coefficient value of −0.119 ($t = -13.930$, $p$ 0.01). Thus, H3 is not supported as the hypothesis expected a positive relationship. This study demonstrates that the combined positions of the chairman and CEO reduce REM activities. This result opposes agency theory, which holds that a board's ability to maintain sight on management's performance is enhanced by separating the CEO's responsibilities from those of the board members. In any case, these findings align with those of Yasser and Al Mamun (2015) and Lin and Hwang (2010). In addition, according to Table 6, the association between CEO political connection and REM is positive and significant at a coefficient of 0.082 ($t = 2.130$, $p$ 0.1). So, H4 is accepted.

The conceivable explanation for this result is that politically connected CEOs typically have access to greater quantities of resources. These resources include preferential treatment by government-owned banks or raw material producers, relaxed regulatory oversight and lighter taxation. So, the CEO with a political connection could use REM to conceal these benefits he gained from being politically connected. Another possible explanation is that politically connected CEOs have the ability to obtain greater amounts of support from the government (Braam *et al.*, 2015), that is why it appears that companies with political connections use REM more often since they tend to be more secretive and can hide the impact of their political connections better. The companies will have a prime motivation to engage in REM. However, this result is in line with agency theory, which posits that politically connected CEOs have the potential to use their political resources to advance their own interests rather than those of shareholders, thereby increasing EM practices. Similar to this result, Al-Sraheen and Alkhatib (2016) and Chi *et al.* (2016) proved that politically linked CEOs are linked to higher REM.

Concerning the control variables, Table 6 presented that firm size is related to REM negatively but insignificantly with a coefficient of −0.007 ($t = -1.330$, $p > 0.1$). In addition, leverage is related to REM with a negative and insignificant relationship with a coefficient value of −0.018 ($t = -0.520$, $p > 0.1$). Moreover, Table 6 revealed that ROA has a negative and significant association with REM, whereby the coefficient value is −0.578 ($t = -6.740$, $p < 0.05$). Finally, as presented in Table 6, sales growth is related to REM with a negative but insignificant relationship with a coefficient value of −0.027 ($t = -0.860$, $p > 0.1$).

*5.3.2 The moderating effect of ownership concentration.* Table 7 displays the results concerning the second purpose of the current study, which is to investigate the moderation aspect of OC on the association between CEO characteristics and REM. According to Table 7, OC moderates the relationship between CEO experience and REM negatively with a coefficient of −0.017 ($t = -2.990$, $p > 0.01$). This result demonstrates that when a company has a high concentration of ownership, even a CEO with a great deal of experience will be less involved in REM practises than in companies with a low concentration of ownership. The result suggests that OC plays a crucial monitoring role in imposing limits on the practice of EM by company managers.

Furthermore, Table 7 presented that OC negatively moderates the association between CEO tenure and REM with a coefficient of −0.021 ($t = -3.190$, $p < 0.05$). The result implies that CEOs who have been in their positions for a long time and work for organisations with a large OC are less probable to engage in REM. Such a result, which is matched with the agency theory, demonstrated that OC is one of the managers' most important monitoring mechanisms. Because of this, it is a very important part of keeping an eye on and controlling the amount of EM that happens.

In addition, the association between CEO duality and REM is not moderated by OC with a coefficient of −0.005 ($t = -1.180$, $p > 0.1$), as shown in Table 7. The discrepancy between the power of large block holders and the power of the person who holds both the CEO and chairman positions could explain this result. REM practices may no longer be influenced by the power of the person who holds both the CEO and chairman positions. However, this finding contradicts agency theory, which proposes that OC is an essential monitoring mechanism for managers.

Moreover, the interaction between OC and CEO politically connected appeared to have a significant and negative association with REM in Table 7 with a coefficient of −0.014 ($t = -2.100$, $p < 0.1$). This finding is harmonised with the agency theory, which holds that a high concentration of shareholders constantly monitors managers.

| Variables | Coef. | *t*-value | *p*-value |
|---|---|---|---|
| CEOEXP | 0.029 | −1.330 | 0.001*** |
| CEOTEN | −0.000 | −0.280 | 0.788 |
| CEODTY | −0.123 | −11.270 | 0.000*** |
| CEOPOL | 0.034 | 0.720 | 0.507 |
| OWNCON | −0.096 | −4.380 | 0.007*** |
| CEOEXPOWN | −0.017 | −2.990 | 0.030** |
| CEOTENOWN | −0.021 | −3.190 | 0.024** |
| CEODTYOWN | −0.005 | −1.180 | 0.291 |
| CEOPOLOWN | −0.014 | −2.100 | 0.089* |
| FSIZE | −0.006 | −1.210 | 0.281 |
| LEV | −0.048 | −1.380 | 0.226 |
| ROA | −0.595 | −8.440 | 0.000*** |
| SGRWTH | 0.000 | 2.350 | 0.066* |
| Constant | 0.165 | 2.020 | 0.099 |
| Number of obs | 348 | | |
| *R*-squared | 0.1584 | | |
| Prob > *F* | 0.000 | | |

**Note(s):** ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
REM = Real Earning Management, CEOEXP = CEO experience, CEOTEN = CEO tenure, CEODTY = CEO duality, CEOPOL = CEO politically connected, OWNCON = ownership concentration; FSIZE = firm size, LEV = leverage, ROA = return on assets; SGRWTH = sales growth

**Table 7.** Results of the regression with Driscoll–Kraay standard errors (the moderating impact of ownership concentration)

The results of this work provide a significant indication that the OC is an essential component in the process of observing REM activities. To begin with, the findings suggested that the OC would control and restrict the ability of CEOs to use the expertise and skills they had acquired during the period of serving as executives to interfere with and alter the accounting information that is included in financial reports.

REM practices are also reduced, as evidenced by the current study's findings, when OC and the tenure of the CEO are taken into account, because it shows that a large level of OC is an effective way to keep tabs on top executives. According to the current study's findings, the interaction between high levels of OC and politically connected CEOs has a negative influence on the practices of REM. This result adds more weight to the argument that OC plays a key role as an effective monitoring mechanism.

The primary concern is ensuring that companies produce high-quality financial reports for regulators, investors and the general public. Enhancing the superiority of financial reporting will assist companies in producing high-quality financial reports. Therefore, investors will base their decisions on the firm's financial reporting. To top it all off, it will entice prospective investors to invest their money into the businesses. Indirectly, it will lead to an improvement in how well the companies execute. In point of fact, delivering regulators and the general public with high-quality financial reporting will send the indication that they have a favourable perception of the company. The firms will be able to conquer the accounting scandals that have occurred in Jordan over the past few years. In brief, the OC has a substantial explanation to handle this issue for Jordanian companies, and they provide inordinate assistance not only to the companies but also to the other stakeholders. However, by having a glance at the results, we can conclude that H5 is partially supported.

## 6. Additional robustness analysis

### *6.1 Alternative proxy for REM*

This section describes an alternative method for REM proxy. So far, our study adopted Zang's (2012) model to measure REM, which is the aggregated measure of real activities manipulation calculated as the abnormal discretionary expenses (DISEXP) multiplied by-1 plus the abnormal production costs (PROD). As an additional analysis, this section uses Roychowdhury's (2006) model to estimate REM activities as an alternative proxy. According to Roychowdhury, REM should be calculated by combining three individual REM metrics and three comprehensive metrics of real activity manipulation to determine the aggregate effects of REM. Therefore, the sum of the standardised variables for abnormal cash flows from operations, abnormal discretionary expenditures multiplied by a negative one and abnormal production costs were calculated to reflect REM. It was combined into a single REM (CREM) measurement, following Cohen *et al.* (2008).

Table 8 Model 1 presents the result of robustness analysis using CREM as an alternative proxy for REM. Model 1 in Table 8 shows that CEO experience is associated with REM with a positive and significant association. This finding is harmonised with the main results shown in Table 6. Moreover, Table 8 (Model 1) presents that the connotation between CEO tenure and REM is positive and significant. This finding is identical with the main results presented in Table 6, which showed the same result.

Furthermore, the results of the further analysis revealed that CEO duality is significantly and negatively related to REM. This finding confirms the main results shown in Table 6. Additionally, Table 8 (model 1) results revealed that the association between CEO political connectedness and REM is positive and significant. This result is equivalent to the main results shown in Table 6.

Concerning the moderating effect of OC, the results presented in Table 8 (model 2) revealed that OC moderates the relationship between CEO experience and CEO tenure with REM

| Variables | Model 1 alternative REM proxy (CREM) without moderator Coef. | *t*-value | *p*-value | Model 2 alternative REM proxy (CREM) with moderator Coef. | *t*-value | *p*-value |
|---|---|---|---|---|---|---|
| CEOEXP | 0.026 | 5.040 | 0.004*** | 0.024 | 3.900 | 0.011** |
| CEOTEN | 0.001 | 2.250 | 0.074* | −0.000 | −1.450 | 0.205 |
| CEODTY | −0.135 | −10.320 | 0.000*** | −0.151 | −7.630 | 0.001*** |
| CEOPOL | 0.057 | 2.020 | 0.099* | 0.011 | 0.250 | 0.815 |
| OWNCON | | | | −0.083 | −3.380 | 0.020** |
| OWNCONCEOEXP | | | | −0.017 | −2.380 | 0.063* |
| OWNCONCEOTEN | | | | −0.027 | −2.930 | 0.033** |
| OWNCONCEODTY | | | | −0.011 | −1.840 | 0.125 |
| OWNCONCEOPOL | | | | −0.013 | −1.490 | 0.195 |
| FSIZE | −0.004 | −0.800 | 0.458 | −0.002 | −0.510 | 0.629 |
| LEV | −0.026 | −0.660 | 0.541 | −0.060 | −1.490 | 0.198 |
| ROA | −0.973 | −5.610 | 0.002*** | −1.002 | −9.650 | 0.000*** |
| SGRWTH | 0.004 | 0.080 | 0.943 | 0.000 | 17.960 | 0.000*** |
| Constant | 0.075 | 1.000 | 0.361 | 0.123 | 1.490 | 0.195 |
| Number of obs | 348 | | | 348 | | |
| *R*-squared | 0.2100 | | | 0.2501 | | |
| Prob > *F* = | 0.000 | | | 0.000 | | |

**Note(s):** ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
REM = Real Earning Management, CEOEXP = CEO experience, CEOTEN = CEO tenure, CEODTY = CEO duality, CEOPOL = CEO politically connected, OWNCON = ownership concentration; FSIZE = firm size, LEV = leverage, ROA = return on assets; SGRWTH = sales growth

**Table 8.**
Regression results for the further analyses (alternative proxy for REM)

negatively. These findings confirm the main results reported in Table 8. Moreover, the results of Table 8 (Model 2) indicate that the OC does not moderate the association between CEO duality and REM. However, this result corresponded to the main results appearing in Table 7. Nevertheless, the results of the further analysis obtainable in Model 2 of Table 8 reported that the OC does not moderate the relationship between the CEO politically connected and REM. This result is not matched with the main results in Table 7, which show that OC moderates the association between CEO politically connected and REM negatively. Taking our results together, we can conclude that our main findings are not affected by the alternative proxy of REM.

### *6.2 Alternative analysis using OLS and PCSE regressions*

In order to confirm the obtained results in the main analysis, we use other regression estimations. At the same time, the results of OLS with robust standard errors are shown in Table 9 (Model 1 and Model 2), Models 3 and 4 of Table 9 report PCSE regression results. According to the findings existing in Model 1 of Table 9, CEO experience and CEO political connections are correlated to REM significantly and positively. Moreover, CEO duality is associated with REM with a negative and significant relationship, as shown in Model 1 of Table 9. These aforementioned findings are typically the same as the main results shown in Table 6. However, inconsistent with the main results, CEO tenure has no significant relationship with REM.

In addition, as presented in Table 9 (Column 2), OC moderates negatively the impact of CEO experience, CEO tenure and CEO political connection on REM. Hence, all the results presented in Model 2 of Table 9 are identical with the main results shown in Table 7. Moreover, as illustrated in Model 3 of Table 9, CEO experience, CEO tenure and CEO political connections are correlated to REM positively and significantly. In contrast, CEO duality is related to REM negatively and significantly. These results totally correspond with the main results that are presented in Table 6.

**Table 9.**
Regression results for the further analyses (alternative analysis using OLS and PCSE regressions)

| Variables | Model 1 alternative analysis using OLS regression without moderator | | | Model 2 alternative analysis using OLS regression with moderator | | | Model 3 alternative analysis using PCSE regression without moderator | | | Model 4 alternative analysis using PCSE regression with moderator | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | *t*-value | *p*-value | Coef. | *t*-value | *p*-value | Coef. | *z*-value | *p*-value | Coef. | *z*-value | *p*-value |
| CEOEXP | 0.026 | 2.80 | 0.005*** | 0.029 | 3.910 | 0.000*** | 0.0305404 | 4.92 | 0.000*** | 0.029 | 5.46 | 0.000*** |
| CEOTEN | 0.001 | 0.80 | 0.425 | 0.000 | −0.120 | 0.907 | 0.0009246 | 1.85 | 0.064* | −0.000 | −0.260 | 0.794 |
| CEODTY | −0.135 | −4.07 | 0.000*** | −0.123 | −4.410 | 0.000*** | −0.1150631 | −10.44 | 0.000*** | −0.122 | −10.45 | 0.000*** |
| CEOPOL | 0.057 | 1.72 | 0.086* | 0.034 | 1.010 | 0.312 | 0.0840609 | 2.81 | 0.005*** | 0.034 | 0.970 | 0.330 |
| OWNCON | | | | −0.096 | −2.470 | 0.014** | | | | −0.096 | −2.94 | 0.003*** |
| OWNCONCEOEXP | | | | −0.017 | −2.070 | 0.039** | | | | −0.165 | −2.52 | 0.012** |
| OWNCONCEOTEN | | | | −0.021 | −1.990 | 0.047** | | | | −0.021 | −1.99 | 0.046** |
| OWNCONCEODTY | | | | −0.005 | −0.850 | 0.398 | | | | −0.005 | −0.950 | 0.343 |
| OWNCONCEOPOL | | | | −0.014 | −2.060 | 0.040** | | | | −0.0138 | −1.88 | 0.060* |
| FSIZE | −0.004 | −0.42 | 0.673 | −0.006 | −0.740 | 0.463 | −0.0067529 | −1.53 | 0.125 | −0.005 | −1.390 | 0.165 |
| LEV | −0.026 | −0.45 | 0.655 | −0.048 | −0.950 | 0.034** | −0.0202328 | −0.41 | 0.685 | −0.048 | −0.850 | 0.397 |
| ROA | −0.973 | −5.24 | 0.000*** | −0.595 | −4.620 | 0.000*** | −0.55125 | −4.82 | 0.000*** | −0.594 | −4.680 | 0.000*** |
| SGRWTH | 0.004 | 0.09 | 0.931 | 0.000 | 0.980 | 0.329 | −0.0229586 | −0.65 | 0.513 | 0.000 | 0.130 | 0.898 |
| Constant | 0.075 | 0.48 | 0.629 | 0.165 | 1.330 | 0.185 | 0.1017627 | 1.56 | 0.119 | 0.164 | 2.51 | 0.012 |
| Number of obs | 348 | | | 348 | | | 348 | | | 348 | | |
| *R*-squared | 0.210 | | | 0.197 | | | 0.1518 | | | 0.1969 | | |
| Prob > *F* = | 0.000 | | | 0.000 | | | 0.000 | | | 0.000 | | |

**Note(s):** ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
REM = Real Earning Management, CEOEXP = CEO experience, CEOTEN = CEO tenure, CEODTY = CEO duality, CEOPOL = CEO politically connected, OWNCON = ownership concentration; FSIZE = firm size, LEV = leverage, ROA = return on assets; SGRWTH = sales growth

Finally, according to the results shown in Table 9 (Model 4), OC moderates negatively the impact of CEO experience, CEO tenure and CEO political connection on REM. This obtained result is in line with the main result in Table 7. In sum, we can deduce that the main findings are robust to different regression specifications. The findings of the additional analyses discussed earlier, when taken as a whole, are quite identical to the results in our main analysis. This lends credence to the study's findings and strengthens the reliability of the primary regression model.

## 7. Implications

### *7.1 Theoretical implications*

The present study's findings have an optimistic impact on the existing body of knowledge. Even more intriguing, the current literature has yet to investigate the role of OC in the connotation between CEO characteristics and EM, that is why this study narrowed it down by looking at CEO characteristics and EM in relation to OC.

Agency theory and the upper echelons theory are the primary theories that provide support for the hypotheses that have been developed for this research. The current research adds to the knowledge of these ideas by contributing new information regarding the characteristics of CEOs. Although a large number of research studies has been conducted to investigate the topic of CEO characteristics utilising the agency theory, the vast majority of these studies concentrated on developed countries, which have a distinct environment in comparison to emerging countries. Consequently, the first theoretical implication of the current study is that it enriches the literature by adding to the understanding of agency theory in an emerging developing country. This is because, in a country like this, where firms do not always follow the recommendations of the corporate governance code and are controlled by a high ownership concentration, the agency relationships can be quite complicated.

This research enriches the literature by employing the upper echelons theory, which examines how the personalities of CEOs and other high-ranking executives influence the values, strategies and disclosure choices made by their organisations. In addition, the findings of this research assist in advancing knowledge in corporate governance and EM.

### *7.2 Practical implications*

The current paper explored the moderation aspect of ownership structure on the association between CEO characteristics and REM. The findings are very important to the participants in the industry, particularly the businesses, the policymakers in government, the investors and the general public as a whole because they demonstrate the effect that CEO characteristics have on EM.

The results obtained in the current study have significant managerial implications since they show how CEO characteristics affect EM performance. Specifically, EM is positively correlated with three chief executive officer characteristics: CEO experience; CEO duality and political connections among CEOs. This lends credence to the idea that these traits play a role in increasing EM and, as a consequence, harming FRQ.

It is also beneficial to practitioners, including shareholders and investors, because it explains the factors that influence EM. Identifying the precise CEO characteristics that produce high-quality financial reports and the role OC plays in these connections can be accomplished by shareholders and investors alike. Regulators can review the findings of this study to learn more about the factors that influence EM, particularly in Jordanian listed companies.

Moreover, these findings will assist investors, practitioners and regulators understand that businesses with high OC and experienced CEOs have better earnings qualities and lower REM practises. This information will be useful to them because it will help them to know which firms have better earnings qualities and low REM practices.

*7.3 Limitations and future avenues*

It is important to keep in mind the limitations of this study when considering possible research directions in the future. To begin with, the current study only looked at a small number of variables related to CEO attributes, which may limit the findings' generalisability. Second, the objections to the perfect model for measuring EM practices have a common and predictable deficiency. There is currently no ideal model widely accepted by scholars and practitioners. As a result, the Roychowdhury (2006) and Zang (2012) models used in this study may not perfectly capture all earning management streams. Hence, in subsequent research, alternative proxies, such as discretionary accruals, should be utilised.

In future work, it may be possible to investigate how the concentration of ownership relates to other characteristics of the CEO, such as their gender, marital status, religion, power, educational background and ethnicity. In addition, future research can study the moderating effect of other ownership structures, including as family ownership, management ownership and foreign ownership, on the link between CEO characteristics and REM. Moreover, future authors could expand this analysis by conducting similar research on the financial sector, which was omitted from the current study.

Lastly, comparative research conducted through a survey or qualitative approach may provide a comprehensive understanding of the nature and complexity of corporate governance efficiency and its application to lowering agency challenges.

## 8. Conclusion

The current study inspects the association between the CEO characteristics and REM, as well as the moderating role that OC has in these relationships. In spite of the fact that a large number of studies have occurred in both developed and developing countries, those studies have almost entirely neglected the moderating role that OC plays. Because of this, the current study might be seen as a novel study because it could fill this gap in the previous research.

The obtained results in the main analysis direct model show that CEO experience, CEO tenure and CEO political connections increase the presence of the REM practice in non-financial Jordanian firms. While CEO duality constrains REM practises in Jordanian non-financial firms, OC reduces and limits REM practises when interacting with CEO experience, CEO tenure and CEO politically connected, as the three interactions had significant and negative associations with REM. Therefore, the expected benefits of CEO characteristics to mitigate REM are more pronounced in the presence of concentrated ownership.

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