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Article

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Accruals, real earnings management, and CEO demographic attributes in emerging markets: Does concentration of family ownership count?

Safia Abdo Ali Al-Begali^{1*} and Lian Kee Phua²

Abstract: The present study utilizes agency theory and the upper echelons theory (UET) to investigate whether there is a moderating effect of family ownership concentration (FOWC) on the association between CEO demographic attributes and two forms of earnings management (EM), specifically accruals earnings management (AEM) and real earnings management (REM). Additionally, this study investigates whether CEO demographic attributes affect EM (AEM and REM) in Jordanian companies. The study sample includes 137 companies listed on the Amman Stock Exchange (ASE) from 2017 to 2021, with the banking and insurance sectors excluded, resulting in 685 company-year observations. To accomplish the study's goals, feasible generalized least squares estimation (FGLS) regressions were applied. The findings indicate that CEO non-duality and age decrease REM and improve the quality of financial reporting (QFR). However, they indicate that CEO age increases AEM, and family ownership concentration enhances the power of older CEOs to engage in AEM and affects QFR. The study finds that a CEO with high education does not affect EM but that the presence of family ownership increases a CEO's capacity with high education to reduce EM (AEM and REM) and generate trustworthy financial reports. However, we don't find any relationship between CEO gender and EM (AEM & REM), but family ownership increases male CEOs' power to engage in AEM. In addition, the outcome shows that family ownership concentration interacts with CEO non-duality and leads to restricting REM and engagement in AEM practices. This study is among the earliest attempts to examine

PUBLIC INTEREST STATEMENT

This paper aims to investigate the relationship between CEO demographic attributes and earnings management (AEM&REM), as well as how family ownership concentration affects this relationship. The study is motivated by the lack of research in Jordan and inconsistent empirical results regarding the impact of CEO demographic attributes on earnings management. The paper uses secondary data collected from firms' annual reports in Jordan. The research findings suggest that CEO non-duality and age decrease REM and improve the quality of financial reporting (QFR). However, they also indicate that CEO age increases AEM. Moreover, the study reveals that family ownership concentration moderates the relationship between CEO demographic attributes and earnings management (AEM&REM), affecting the quality of financial reporting. The results of this study are significant in providing meaningful insights for various stakeholders, such as management, investors, and owners, about the QFR and EM practices in emerging markets, especially those with family ownership concentration.

how family ownership concentration affects the connection between CEO demographic attributes and EM, using both types of EM (AEM and REM). Thus, the results of this study are significant in providing meaningful insights for various stakeholders, such as management, investors, and owners, about the QFR and EM practices in emerging markets. Also, the outcomes of this study can contribute significantly to the existing literature on CEO characteristics, family ownership concentration, and EM practices. The findings can be used by the board of directors, policymakers, and regulators to re-evaluate the selection criteria for CEOs based on specific characteristics that can affect QFR. However, the results may not be applicable to markets that are characterized by dispersed ownership structures, where family ownership is not a dominant factor.

Subjects: Financial Accounting; Corporate Governance

Keywords: earnings management; family ownership concentration; CEO demographic attributes; Jordanian companies

1. Introduction

Earnings management (EM) is a strategy employed by the management of a firm to alter financial reports and mislead the organization's implicit performance by aligning the figures with a previously established target. This practice is used for income-smoothing to obtain private gain or "influence contractual outcomes that depend on reported accounting numbers" (Healy & Wahlen, 1999). EM is categorized into two forms. The first form is accruals-based earnings management (AEM), which involves adjusting the accruals to achieve the desired level of earnings by exploiting the advantage of the flexibility offered by accounting principles that do not impact actual cash flows (Healy & Wahlen, 1999). The second form is real earnings management (REM). According to Roychowdhury (2006), REM is a deviation from ordinary business operations that affect real cash flows, such as manipulating sales discounts, period of collection, or a reduction of discretionary expense. Therefore, REM may damage the company's value because it negatively affects future cash flows. The occurrence of EM is often attributed to conflicts of objectives between owners and agents, as well as information asymmetry (Ghaleb et al., 2020, 2021). Insiders, such as managers and controlling owners, exploit this information asymmetry to conceal the actual performance of companies, resulting in the presentation of low-quality and ambiguous information (Zhang & Zhangs, 2018).

Financial reporting aims to present companies' true financial position, which helps financial statement users make decisions upon the relevant information disclosed (Musa et al., 2023). Managers know that the earnings metric inside financial reporting is the focus of attention for beneficiaries of financial reporting, including creditors and investors, and they use it to evaluate companies' future cash flow and are dependent on it when they make an investment decision (Alhmoed et al., 2020). Additionally, earnings are used not only as a metric for assessing managers' performance but also as a foundation for determining the amount of remuneration that should be awarded to managers (Ali & Zhang, 2015). Thus, the chief executive officer's (CEO's) responsibility for corporate decisions on releasing financial information, corporate performance, and influencing the board may raise the possibility of EM practices (Musa et al., 2023). The company's CEOs are generally regarded as the most influential person in the firm they are managing because they have the authority to access all relevant information about the company's activities (Qawasmeh & Azzam, 2020). CEOs have more influence over business choices and can use their status as top executives to improve their compensation by managing earnings (Chou & Chan, 2018; Liu et al., 2018; Musa et al., 2023). They do that for a variety of reasons, including to increase CEO stock-based remuneration, smooth out earnings, avoid violating debt covenants, and meet or surpass stock analyst expectations (Kliestik et al., 2021). As a result, their practice of EM

reduces the accuracy and validity of financial reporting since the details provided in these documents might not fully reflect the enterprise's fundamental state (Healy & Wahlen, 1999). Consequently, investors' confidence in these reports will decrease (Gonzalez & Garcia-Meca, 2014).

There is a growing concern about improving transparency, trust, and integrity in financial reporting (Nguyen et al., 2021). The development of corporate governance regulations worldwide is one response to this concern, as these regulations aim to promote accountability, transparency, and ethical behavior among companies and their leaders. CEO characteristics are an important element of corporate governance, as the CEO plays a crucial role in setting the tone at the top and establishing the company's culture and values. In this regard, the Jordanian corporate governance code (JCGC) was issued in 2008 and updated in 2012 and 2017. JCGC emphasized that members of the senior management must be qualified and experienced to conduct their duties effectively and should separate the role of Chairman and CEO in Jordanian companies (JSC, 2017). According to agency theory, separating the CEO and Chairman roles improves organizational discipline and systematic monitoring and reduces the entrenchment of the CEO (Jensen & Meckling, 1976). Thus, decreasing the authoritative power of a single member over all other representatives on the board and improving the compliance status of corporate governance guidelines (Uddin, 2023).

Previous studies confirmed that most Jordanian companies have complied with this requirement, as only a minority of Jordanian companies have one person serving in both the CEO and Chairman roles (Al-Haddad & Whittington, 2019; Alhmood et al., 2020; Bataineh et al., 2018; Kharashgah et al., 2019). As a result, this may be a sufficient reason to study the CEO's demographic characteristics separately from those members of the board directors, including the Chairman, who has been discussed in many previous studies. Thus, this study aims to study the impact of CEO non-duality on EM after updating the Jordanian Corporate Governance Code.

A CEO try to improve the companies' earnings and performance as the CEO is a critical agent who manages the company on behalf of the shareholders with the aim of achieving a favorable operational performance (Chandren et al., 2021; Chou & Chan, 2018). Furthermore, CEOs are critical to the corporation's advancement or failure because their survival and success depend on the high quality of the CEOs' performance (Altarawneh et al., 2020). According to Rashid et al. (2018), CEOs play a crucial role in overseeing the company's financial reporting process, which can be influenced positively or negatively by their actions. They do so because they have the skills and power to obtain all fundamental details regarding the company's operations and activities (Qawasmeh & Azzam, 2020). They hold the most senior leadership level, so they take advantage of their sitting in higher positions in the company and direct companies to seek opportunities to improve their reward and remain in their position (Chou & Chan, 2018; Liu et al., 2018). However, it is suggested that CEO traits play a major and distinctive role in influencing financial report quality (Altarawneh et al., 2022; Huang et al., 2012; Musa et al., 2023). Also, Hambrick and Mason (1984) claimed that strategic options were substantially influenced by the CEO's demographic characteristics, which affected their rules and cognitive values, and that a manager's properties could help predict the outcomes of the corporation. Accordingly, there is a great debate about whether the role of the CEO is an oversight role or an opportunistic one to achieve his own interests in isolation from the interests of shareholders. Also, despite the reality that many businesses worldwide have gone under because of CEOs' earnings manipulation practices, there is a shortage of research into the correlation between CEO demography traits and EM, which is surprising given the importance of the topic, particularly in developing countries. Also, they reported mixed results about the opportunistic role of the CEO in engaging in EM (Alhmood et al., 2020; Alqatamin et al., 2017; Altarawneh et al., 2022; Belot & Serve, 2019; Gavius et al., 2012; Lakhal et al., 2015; Peni et al., 2010; Qi et al., 2018). They did not provide a definitive explanation of why CEOs were involved in the collapse of many companies. In addition, scholars have suggested that additional research is necessary to comprehensively examine how the attributes of a CEO interact with EM (Altarawneh et al., 2020; Chou & Chan, 2018). Earlier investigations demonstrated that Jordanian enterprises engage both types of EM (Al-Haddad & Whittington, 2019; Alhadab, 2018; Enomoto et al., 2015).

Therefore, this study seeks to verify the EM practice using both strategies (accrual and real) to give a comprehensive picture of EM. As a result, this research aims to delve deeper into the connection between the CEO's attributes, including CEO demographic attributes, and EM (AEM&REM) in Jordanian firms after the update of the Jordanian corporate governance code in 2017.

The ownership structure is regarded as among the essential mechanisms of corporate governance (CG), particularly in Jordan, where CG in Jordan can be described as an "ownership-based model" (Al-Msiedeen & Al Sawalqa, 2021). Most of the ownership in companies is families and the most significant aspect of ownership in Jordan (Alqatamin et al., 2017; Alzoubi, 2016; Bataineh et al., 2018). As a result, they have the authority to appoint family members to senior management roles. Thus, it isn't easy to separate ownership from management in the light of Jordanian companies whose families dominate them because the CEOs are the owners themselves in most cases, or the family members are the ones who appointed the CEO and thus, may influence the decisions of the CEO (Alhadab et al., 2020). Appointing a CEO among family members is common in Jordanian companies, as 90% of Jordanian companies have their executive managers come from family members, and the founders' sons occupy most of the CEO positions in Jordanian family companies (Saidat et al., 2019). Thus, it is expected to increase the power of the CEO, which he derives from the power of the dominant family. Therefore, CEOs may seek to expropriate minority interests in favor of the royal family because of their sense of loyalty to their families. In addition, it is possible for owners to request that CEOs manipulate data and records in order to accomplish the goals of the organization. Given the sensitivity of CEO pay, corporate owners may offer financial and non-financial incentives to encourage such behavior. Furthermore, if the CEO also serves as the chair, they may be influenced to manipulate reports by offers from the company owners (Uddin, 2023).

Reviewing previous studies, it is notable that they have studied the direct link between family ownership and EM in various areas and have found that family ownership affects EM and QFR (Achleitner et al., 2014; Al-Duais, Ali, et al., 2021; Chi et al., 2015; Ghaleb et al., 2020; Tian et al., 2018; Tsao et al., 2019). Also, prior research has investigated the impact of CEO attributes on EM; the results have been varied and inconclusive. The institutional context of these studies may account for the inconsistent findings, as many were conducted in countries with strong investor protection mechanisms (Githaiga et al., 2022). Based on the mixed results of prior research, there is a need to investigate the potential moderating influence of factors on the relationship between CEO attributes and EM. Family ownership concentration is one such factor that may play a significant role in this regard. Therefore, the objective of this study is to contribute to previous studies by examining whether family ownership concentration weakens or strengthens the connection among CEO demographic attributes and EM in the Jordanian market during the period 2017-2021, which included two significant events: an update of the Jordanian corporate governance code and the COVID-19 pandemic, which affected the global economy.

The current research is important for many reasons in developing economies like Jordan. First, the Jordanian market has weak corporate governance, poor institutional contexts, high concentration ownership, and poor investors protection. Second, although there is increasing interest in studying the association between CEO attributes and EM, there is currently a lack of research on the association between CEO characteristics and EM in Jordan as a developing country, and the few studies that have been conducted have yielded mixed findings (Alhmoode et al., 2023; Alhmoode et al., 2020; Alqatamin et al., 2017; Qawasmeh & Azzam, 2020). Third, the previous studies examined the effect of CEO characteristics on AEM in isolation from REM (Alqatamin et al., 2017; Qawasmeh & Azzam, 2020). On the other hand, other studies examined the effect of CEO characteristics on the REM in isolation from the AEM (Alhmoode et al., 2023; Alhmoode et al., 2020). Therefore, focusing on one specific EM strategy without the other may not reflect the full picture of EM. Also, Jordan practices both types of EM (AEM & REM), as documented in prior studies (Al-Begali & Phua, 2023; Al-Haddad & Whittington, 2019; Alhadab, 2018; Enomoto et al., 2015). In addition, Jordanian corporations employ both AEM and REM as complementary strategies to

maximize their impact on earnings (Al-Begali & Phua, 2023; Al-Haddad & Whittington, 2019). As a result, EM is an inherent issue in Jordanian companies, and the reasons behind its spread need to be studied. Fourth, a lack of faith in listed corporations' financial statements also drives foreign investment out of the stock market (Uddin, 2023). Unlike numerous other wealthy nations, Jordan heavily depends on foreign finance due to its domestic financial market limitations (Aburishah et al., 2022). Therefore, investigating the factors that contribute to EM in the Jordanian market and prioritizing the maintenance of high-quality financial reporting is crucial to maintain the confidence of foreign investors, who make up approximately 50% of the total investment in the Jordanian market. Accordingly, our study examines the effect of CEO demographic attributes on the AEM and REM. Fifthly, most of the previous studies have focused on examining the impact of CEO duality on EM (Al-Haddad & Whittington, 2019; Kharashgah et al., 2019), whereas our study aims to investigate the effect of CEO non-duality on EM. Sixthly, the previous investigation conducted in the Jordanian context was carried out prior to the implementation of the updated Jordanian Corporate Governance Law in 2017 and employed relatively small sample sizes (Alhmoody et al., 2023; Alhmoody et al., 2020; Alqatamin et al., 2017; Qawasmeh & Azzam, 2020). Thus, this study is motivated by the increased number of listed enterprises in the Jordanian capital market as our research focuses on the period following the update of the Corporate Governance Law in Jordan and involves the analysis of 137 companies. Sixthly, the high family ownership concentration and distinct attributes make emerging countries, such as Jordan, interesting. Thus, the objective of this study is to provide new evidence on EM by incorporating family ownership as a moderating variable in the association between CEO demographics attributes and EM.

This study has two purposes. First, it investigates the effect of CEO demographic attributes (CEO non-duality, CEO gender, CEO education, and CEO age) on EM (AEM&REM) in an emerging economy, Jordan. The second objective is to examine the potential effect of family ownership concentration on the association between CEO demographic attributes (i.e., CEO non-duality, gender, education, and age) and EM. This study uses AEM and REM techniques in a developing country to fulfill the purposes. Necessary data has been collected from the annual reports of the selected manufacturing and service companies in the Amman stock exchange (ASE) from 2017 to 2021. Several statistical tests (Heteroscedasticity, multicollinearity, and endogeneity tests) have been conducted to check the endogeneity and other robustness issues. Also, to check the robustness of the findings, the study uses alternative models of AEM and REM. Our results demonstrate that CEO non-duality and age reduce REM and improve the quality of financial reporting. However, the results show that CEO age increases AEM, and the presence of family ownership concentration increases the CEO's power who is older to engage in AEM and affects QFR. However, we find that the CEO with high education does not affect EM, but the presence of family ownership concentration improves the ability of CEOs with high education to reduce EM (AEM and REM) and produce reliable financial reports. Also, we don't find any relationship between CEO gender and EM (AEM & REM), but family ownership increases male CEOs' power to engage in AEM. In addition, we find that family ownership concentration interacts with CEO non-duality and leads to restricting REM and engagement in AEM practices.

The present study aims to provide the following contributions. First, this study targets the Jordanian market, which is considered developing, and the family controls most companies. As a result, the results of our study will offer a fresh perspective on emerging markets and contribute further insights to the existing literature on EM by examining data from the Amman Stock Exchange, specifically focusing on industrial and service companies. Secondly, this study aims to fill the gap in the literature by conducting an empirical analysis of the behavior of CEOs in the implementation of EM, whose actions vary based on their demographic characteristics that influence their decision-making and direction in Jordan after the update of the Jordanian corporate governance code (2017-2021). This aspect has not been addressed in previous studies. The study expands the existing literature by utilizing agency theory as the fundamental theory and upper echelons theory as a supplementary theory to elucidate the association. Specifically, the study examines the association between the CEO's characteristics (CEO non-duality, CEO gender,

CEO age, and CEO education) and EM. Thus, the outcomes of this article are an excellent addition to the previous literature, and they can help the board of directors reconsider the criteria on which CEOs are appointed according to specific characteristics they must possess. Thirdly, the outcomes of this study could assist prospective investors in acquiring fundamental knowledge of the impact of family ownership on the link between CEO characteristics and EM. It can contribute towards better comprehending the distinctive factors that affect EM practices in emerging markets, including the significance of family ownership and CEO demographic attributes. Also, the findings of this study offer an opportunity to assess the efficacy of corporate governance regulations after updating in limiting the opportunistic behavior of the CEO in light of family ownership concentration. As a result, the findings of this research could help policymakers and regulatory bodies to take action to improve future updates or revisions to the corporate governance regulations in Jordan. Fourth, the results of previous studies have documented that female CEOs are more ethical and help enhance the quality of financial reports by restricting the practice of EM because they avoid risks. However, the Jordanian Corporate Governance Law did not enact any law obligating Jordanian companies to appoint women to senior positions as CEOs (Ghaleb et al., 2021). Thus, the results of our study have documented a small percentage of women appointed as CEO and found that the male CEOs in family companies engaged in AEM. As a result, this may signal to the policymakers and regulators that reviewing the corporate governance law and enacting laws obligating Jordanian companies to appoint women in senior positions as CEOs is necessary. Fifthly, shareholders and investors can identify the particular CEO characteristics that lead to producing high-quality financial reports based on the findings of this study. Regulators can also utilize the results of this study to investigate the factors influencing earnings management, specifically among listed companies on the Amman Stock Exchange. Lastly, our study aimed to comprehensively understand EM by examining AEM and REM. This approach differs from other studies that only focused on one strategy without considering the other.

The remaining sections of this paper are organized as follows: Section 2 provides the background information; Section 3 outlines the theoretical framework; Section 4 reviews the prior literature and explains the development of the research hypotheses; Section 5 describes the research design; Section 6 presents and discusses the study findings; Section 7 reports additional analyses and robustness tests; and, finally, Section 8 concludes the study.

2. Background

The global financial crises and increased fraud in companies' financial reporting happened in developed and developing countries. Jordan has witnessed many failures and financial scandals that afflicted some Jordanian companies. For example, in 1989, the collapse of the Petra Bank, the events of the Shamayleh Gate in 2003, and the scandals of the Almsfofah Company. During the period (2000-2011), 44 Jordanian companies bankrupt due to their poor performance and, consequently, their financial fraud practice to cover up their poor performance and give investors a better picture of these companies. The number of bankrupt companies reached 26 from the industrial sector, 15 from the services sector, and three from the financial sector. Therefore, Jordan suffered from a severe financial crisis, business failure, and the Jordanian dinar exchange rate deterioration, resulting in Jordanian public companies losing 40% of their capital. In addition, the collapse occurred in the Bait Al-Mal Company for Saving and Investment, the Phosphate Mines Company, and the Jordanian Company for Reconstruction Holding in 2012, 2013, and 2017 respectively. As a result, Jordanian banks incurred more than a billion U.S. dollars due to the events of the Shamayleh Gate (Alhmoode et al., 2020). Also, due to subsequent losses and high operational costs caused by mismanagement, the parent company of the airline Royal Jordanian declared bankruptcy on November 13, 2018.

In the aftermath of the global financial crises and heightened instances of fraudulent financial reporting in companies, corporate governance regulations have emerged as one of the most significant global concerns. Effective corporate governance practices serve as a means of bolstering the engines of economic growth. Hence, by consistently enhancing corporate governance

policies and practices in line with international standards, the economies of the Middle East and North Africa can be strengthened, furthering their ambitions. This will increase transparency, accountability, and confidence, protecting investors' rights and attracting both local and foreign investors to participate in the capital market (OECD, 2019). Accordingly, regulators worldwide are constantly updating corporate governance mechanisms to increase the effectiveness of their supervisory system and produce high-quality financial reports. Thus, avoiding the collapses that companies may be exposed to due to not exercising corporate governance mechanisms properly.

In Jordan, the Corporate Governance Code was established by regulators in 2008 and subsequently implemented in 2009. The code was created with the collaboration of several regulatory bodies, including the Amman Stock Exchange, the Central Bank of Jordan, the Securities and Exchange Commission, and the Insurance Commission, and the principles of the OECD primarily informed its recommendations. These codes aim to institute a transparent framework that governs the management and relationships of Shareholding Companies Listed on the Amman Stock Exchange to determine the committee's responsibilities and authorities and preserve the rights of all stakeholders. It was updated in 2012, then the last update of the corporate governance was carried out in 2017. The Jordanian Corporate Governance Code focuses specifically on the role of boards of directors and audit committees as important mechanisms for monitoring companies and ensuring high-quality reporting (JSC, 2017). It sets standards about the Formation and diversity of the board of directors, board of directors' functions, qualifications, and responsibilities.

In 2017, the Securities Commission's Board of Directors approved the publication of corporate governance instructions for joint-stock companies listed under Securities Law No. (18). These instructions apply to all joint-stock companies listed in the stock market. According to Article (4), the positions of the chairman and CEO cannot be combined. Additionally, Article (9) mandates that the Governance Committee ensures the company's adherence to the instructions and produces an annual written governance report that assesses the company's compliance with the governance instructions. The 2017 directives adopted a more stringent stance on the need to comply with the requirements while providing companies with sufficient time to adapt to the new corporate governance guidelines. Typically, Jordanian public-listed companies include the names of board members and senior executives in their annual reports, along with information on the number of shares owned by these individuals or their close relatives. Moreover, the annual report lists the names and percentage of ownership of both individual and institutional shareholders owning 5% or more of the company's shares (Alhadab et al., 2020). However, despite Jordan adopting those codes, all codes' recommendations are not legally binding, except the corporate governance code of 2017 (JSC, 2017). The Corporate Governance Code asserts that adhering to these regulations can lead to numerous advantages, such as enhancing the performance of the national economy and promoting good business practices within the community. Therefore, a distinction is made between Jordanian companies that apply the corporate governance rules and those that do not. Thus, the companies that do not apply these rules are subject to penalties, such as being downgraded from the first to the second market, which could result in a decline in the company's share price (JSC, 2017).

The Amman Stock Exchange (the Jordanian capital market), established in 1995, is regarded as one of the most advanced and significant markets in the Middle East. The rate of foreign investment in the Jordanian market is among the highest in the world. According to the Amman Stock Exchange report, in 2020, the net non-Jordanian investment amounted to 51.1% of the total investment in the Amman Stock Exchange (ASE Annual Report, 2020). However, it decreased by the end of June 2021 to 49.0% of the total market value. Jordan is considered the best environment for investment because of the security that Jordan enjoys and the advantages granted to foreign and Jordanian investors on an equal basis, represented in tax exemption and customs duties (Al-Haddad & Whittington, 2019). It occupies the third rank in the Middle East and North Africa region in attracting foreign investment (Al-Haddad & Whittington, 2019). The Amman Stock Exchange is divided into four sectors: banking, insurance, services, and industry. Jordan is

considered one of the small countries with limited natural resources, such as potassium and phosphorous, and suffers from water scarcity and low agricultural production. Therefore, the Jordanian economy is highly dependent on the service sector, where the services sector contributes 81% to GDP, and the industrial and agricultural sectors contribute 19% to GDP (Al-Haddad & Whittington, 2019). Thus, our study focuses on the industrial and service sectors.

As part of the Middle East and North Africa, Jordan suffered from the COVID-19 pandemic crisis, as the repercussions of the COVID-19 pandemic posed a great danger to the Jordanian economy. The COVID-19 pandemic has had a significant impact on various sectors, including energy, currencies, commodities, materials, consumerism, productivity, aviation, and others (ASE Annual Report, 2020). Similar to other financial markets, the Amman Stock Exchange experienced a decline in its performance indicators and market value due to the pandemic's effects. Whereas, during 2020, the Amman Stock Exchange witnessed a decline in its main activity represented in trading securities. Its revenues decreased by 26% compared to 2019, and the stock exchange achieved financial losses of 715,000 Jordanian dinars (ASE Annual Report, 2020) and the decline in foreign investment in the Amman Stock Exchange mentioned earlier. However, the performance of the companies was diversified during the year 2020; 185 companies were traded, as the Shares price of 90 companies increased and the shares price of 87 companies decreased, while the shares price of 8 companies stabilized (ASE Annual Report, 2020).

EM occurs when managers modify or distort financial reporting to achieve their own goals, and it is done through two methods based on the earnings composition, including operations cash flow and accruals. The agency's conflict arises between managers and owners with dispersed ownership or between majority and minority shareholders in companies with concentrated ownership (JENSEN, 1993). Managers may use several techniques of manipulating profits to avoid reporting losses to improve their company's image from their point of view (Oussii & Klibi, 2023). However, the incidence of earnings management (EM) in emerging markets is higher than in non-emerging markets because corporate governance mechanisms in developing markets are often ineffective, primarily due to concentrated ownership and weak investor protection.

The ownership structure in Jordan is distinctive as it is predominantly characterized by concentrated ownership, particularly family ownership, which is prevalent in the country's business sector. This means a few shareholders essentially control the companies in Jordan (Alqatamin et al., 2017; Alzoubi, 2016; Bataineh et al., 2018). It distinguishes Jordanian companies from their counterparts in developed countries, as the latter is characterized by ownership shares distributed among many shareholders (Saidat et al., 2019). Therefore, agency problem type (II) will arise between majority and minority shareholders in Jordanian companies (Al-Msiedeen & Al Sawalqa, 2021). Accordingly, majority shareholders may seek their self-interest by expropriating minority shareholders' rights. Furthermore, it is expected that family ownership might affect the behavior of the CEOs and motivate them to practice EM to achieve the interest of family owners.

Most of the literature studies that have examined EM have focused on developed countries, which have different contextual backgrounds compared to developing countries. Developing countries are distinguished from developed countries by various characteristics, including weak investor protection and concentrated ownership, which may alter our perspective on EM and CEO behavior in developing countries. Specifically, several factors underpin the study of EM in Jordan. Firstly, it is noteworthy that Jordan is ranked relatively low in terms of investor protection compared to most countries worldwide, and most companies are controlled and managed by families. Secondly, Jordanian companies have been found to engage in aggressive (AEM) and (REM) practices to conceal their actual performance. Consequently, EM is a significant issue in the Jordanian market. Thirdly, it is worth noting that the majority of Jordanian companies adhere to the Jordanian Corporate Governance Code (JCGC), which mandates the separation of the CEO and Chairman positions. Consequently, studying the characteristics of the CEO independently of the Chairman is crucial. Our study aims to investigate the relationship between CEO demographic attributes and

EM while also exploring the impact of family ownership on this association in the emerging Jordanian market, which has not been extensively explored yet.

3. Theoretical framework

Our discussion is based on agency theory and upper echelons theory, which explains the association between CEO demographic attributes and EM. Also, they explain family ownership as a moderator of that relationship as follows:

3.1. Agency theory

Agency theory is a well-established framework for analyzing the relationship between shareholders and managers. The theory posits that separating ownership and control can create a potential conflict of interest between shareholders and managers (Jensen & Meckling, 1976). Shareholders are interested in maximizing their returns on investment, while managers may prioritize their own interests, such as job security, power, prestige, and financial gain, which may not always align with the interests of the shareholders. In agency theory, information asymmetry is a significant issue as managers often have greater access to information about a firm's operations, assets, liabilities, and opportunities than shareholders (Fama & Jensen, 1983; Jensen & Meckling, 1976). This information advantage gives managers the ability to manipulate information, hide negative news, and make decisions that benefit themselves at the expense of shareholders. Information asymmetry can create a situation where managers become opportunistic and act in their interest rather than that of the shareholders (JENSEN, 1993).

In the context of EM, agency theory can explain how managers may engage in activities that manipulate reported earnings to meet or exceed the expectations of shareholders or other stakeholders. Thus, managers can mislead shareholders by managing financial information to achieve their goals, influencing the quality of financial reporting. According to agency theory, managers may engage in EM to signal to shareholders that they are performing well and should retain their agent positions (Oussii & Klibi, 2023). By manipulating earnings, managers can create the appearance of financial success, which may lead to increased compensation, job security, and other benefits, even if it means sacrificing long-term shareholder value.

On the other hand, agency theory says that avoiding duality improves corporate discipline and oversight, which may make corporations more accountable. Non-duality indicates the separation of the CEO and Chairperson roles, where two individuals hold the positions. CEO non-duality can provide a system of checks and balances within the company, as the board of directors can provide oversight and hold the CEO accountable for their actions (Fama & Jensen, 1983; Oussii & Klibi, 2023; Uddin, 2023). This can help reduce the potential for managers to prioritize their interests over those of the shareholders. Thus, it may affect the propensity of CEOs to engage in EM and lead to more transparent and accurate financial reporting.

Agency theory posits that when a firm separates ownership and control, it creates agency problems. Ownership concentration is one method to decrease the conflict between managers and owners, as the concentration of ownership and involvement of family members can lead to the alignment of the interest of owners and managers (decrease agency problem type I). However, this concentration will create conflicts of interest between the family (majority) and non-family shareholders, which is called agency problem type II. Agency theory suggests that in family businesses where ownership is highly concentrated among family members, the majority of shareholders may use earnings management (EM) as a means to achieve their interests and increase their wealth, potentially at the expense of minority shareholders who may have limited power to protect their rights (Cherif et al., 2020; Jensen & Meckling, 1976; Razaque et al., 2016). In this regard, a higher level of family ownership provides members with deeper entrenchment and hence, more opportunities to achieve family goals. Previous studies showed that ownership structure, especially family ownership, strongly affects a company's QFR (Achleitner et al., 2014; Al-Begali & Phua, 2023; Al-Duais, Ali, et al., 2021; Alzoubi, 2016; Chi et al., 2015; Ghaleb et al., 2020;

Tian et al., 2018; Tsao et al., 2019). In other words, entrenched family owners may be incentivized to extract wealth from minority shareholders by exerting pressure on firm management to practice EM. According to agency theory, family ownership can play a significant role in determining the behavior and decision-making of CEOs. When a family has significant ownership control over an organization, they may have a greater power to influence the organization's governance and strategic decisions, including the appointment of the CEO. Family-owned firms may prioritize the family's interests over those of other shareholders. They may be more likely to engage in nepotism, where family members are given preferential treatment concerning appointments and compensation. Thus, this can lead to a situation where the CEO is more concerned with pleasing the family owners than with maximizing shareholder value.

3.2. Upper echelons theory (UET)

Contemporary studies that focused on the CEO demographic attributes and EM have popularized the use of the upper echelons theory (Altarawneh et al., 2022; Musa et al., 2023; Oussii & Klibi, 2023; Taleatu et al., 2020). The UET is based on the idea that high-level managers' knowledge, education, and experiences can directly impact organizational outcomes. According to this theory, executives make decisions that align with their cognitive base, including their values, cognitive models, and personality factors (Hambrick & Mason, 1984). The theory also suggests that demographic attributes (such as age, education, gender, and others) are systematically related to the underlying cognitive orientations and knowledge base (Hambrick, 2007). In this framework, the theory predicts that the CEO's specific skills and personal characteristics can influence the company's value creation, strategic decisions, and organizational outcomes, such as financial reporting. Therefore, CEO attributes are believed to play a significant role in a company's management, and strategic plans significantly impact organizational outcomes, such as earnings quality. In this regard and in line with the upper echelons theory, several studies have employed the upper echelons theory to explore the relationship between CEO demographic attributes and EM and provide evidence that CEO attributes affect decision-making and outcomes organizational, such as earnings management (Altarawneh et al., 2022; Musa et al., 2023; Oussii & Klibi, 2023; Taleatu et al., 2020). Thus, our study follows the previous study and uses this theory to explain the relationship between CEO demographic attributes and EM.

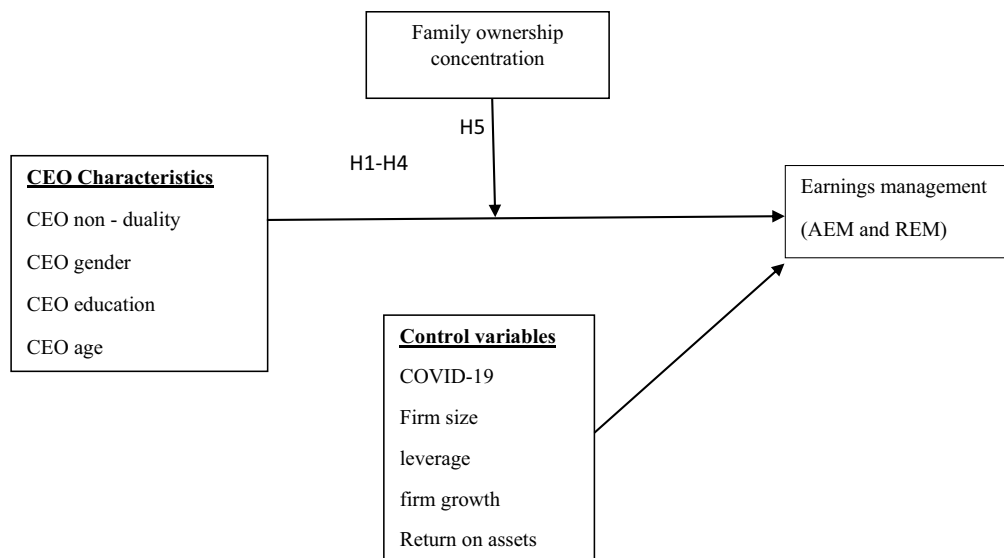
In sum, this study utilized both the agency and upper echelons theories to explore the association between CEO demographic attributes and EM. The agency theory focuses on the relationship between principals and agents and how it can affect decision-making. In contrast, the upper echelons theory emphasizes how CEO demographic attributes, such as gender, age, and education, can shape their attitudes and decision-making processes. By incorporating both theories, the study aimed to better understand how CEO demographic attributes impact EM practices and how family ownership affects that relationship. Figure 1 presents the theoretical framework of the current study.

4. Literature review and development of hypothesis

4.1. Earnings management and the CEO demographic attributes

When managers change or falsify financial reporting to meet their objectives, it is called earnings management (EM). It is done through two methods based on the earnings composition, including operations cash flow and accruals. It's caused by a misalignment of priorities between the company's management and its owner (Jensen & Meckling, 1976), as managers may manipulate earnings to maximize their income or increase their profits, rewards, and personal interests (Healy & Wahlen, 1999). EM is practiced by exploiting flexibility in accounting options and the use of discretion or judgment by managers in preparing financial reporting so that they do not reflect the company's actual performance (Healy & Wahlen, 1999). This way is called EM by accruals. Also, it is employed by management when they adopt measures outside of real procedures to achieve a predetermined profit target. This method focuses on maximizing profits through "real activities" (Roychowdhury, 2006).

Figure 1 Theoretical framework.



According to agency theory, EM can be explained as opportunistic behavior by managers to manipulate earnings to achieve various incentives (Jensen & Meckling, 1976). One of those managers is the Chief Executive Officer (CEO), who manipulates financial information (earnings management) to increase remuneration. They take advantage of their sitting in higher positions in the company and direct companies to seek opportunities to improve their reward and remain in their position simply (Chou & Chan, 2018; Liu et al., 2018). Chief executive officers may manage earnings to maximize their own benefit, such as their compensation (Ali & Zhang, 2015), especially in emerging markets where the companies determine CEOs' compensation based on the company's financial performance (Qawasmeh & Azzam, 2020). They can do that easily because they are the company's most powerful person and have the ability and authority to obtain all pertinent information regarding the company's activities and operations (Alhmoed et al., 2020; Chou & Chan, 2018).

Previous studies proved that most companies' failures were due to the CEO's misuse of his position and manipulation of financial reports to serve his interest (Qi et al., 2018; Troy et al., 2011). However, some contend that the CEO is crucial in overseeing the financial reporting process of the enterprise (Rashid et al., 2018), enhancing the performance of companies and the quality of financial reporting, as many companies have achieved success in their business activities due to CEO attributes (Altarawneh et al., 2020). Thus, the efficiency of CEOs depends on their attributes because the company's survival and success depend on the high quality of the senior managers' performance (Altarawneh et al., 2020), as the demographic attributes of the CEO affect the quality of accounting information (Belot & Serve, 2019). Furthermore, the upper echelons theory argues that managers' managerial backgrounds, experiences, and levels of education play an important role in influencing the corporation's strategies, options, and performance (Hambrick & Mason, 1984). According to Hambrick (2007), considering the fundamental tendencies and biases of a company's top executives who are the strong actors is the most useful method to understand that company's performance. Therefore, it is significant to investigate the impact of CEOs' demography attributes on earnings manipulation and how the family ownership concentration effects on this relationship, especially in developing countries, to provide greater insight into how CEO traits affect business results and the accuracy of financial reporting.

4.1.1. The separate position of CEO and Chairman (CEO non-duality)

CEO non-duality refers to the separation of CEO and Chairperson roles. According to agency theory, avoiding duality (CEO non-duality) can provide a system of checks and balances within the company,

as the board of directors can provide oversight and hold the CEO accountable for their actions. CEO non-duality reduces managers' potential to prioritize their interests over those of the shareholders. Furthermore, the separation of CEO and Chairman positions primarily reduces the CEO's ability to exert excessive influence over the board of directors (JENSEN, 1993). As a result, it could reduce the likelihood of CEOs engaging in EM and promote more transparent and accurate financial reporting. The agency theory emphasizes the avoidance of duality to reduce the entrenchment of the CEO and explains that duality means that the person who makes the decision is the same person who supervises its implementation. As a result, the board of directors is less effective in controlling the opportunistic behavior of managers (Jensen & Meckling, 1976). In contrast, the CEO duality allows top management to be more powerful. Therefore, they practice EM to report positive earnings and appear the companies a good performance (Oussii & Klibi, 2023).

For the past two decades, CEO duality has been of interest to many researchers and academics (Al Azeez et al., 2019; Al-Haddad & Whittington, 2019; Daghnsni et al., 2016; Gulzar & Wang, 2011; Kharashgah et al., 2019; Oussii & Klibi, 2023; Uddin, 2023). They argued that separating chief executive and Chairman positions is more efficient. However, there is significant controversy among previous studies regarding the impact of CEO non-duality on the quality of earnings, as indicated by mixed (inconsistent) findings. Some previous studies found that CEO non-duality helps in restricting EM (Al Azeez et al., 2019; Daghnsni et al., 2016; Gulzar & Wang, 2011). Bouaziz et al. (2020) found that CEO duality is more likely to manipulate AEM. Al-Haddad and Whittington (2019) and Kharashgah et al. (2019) found that CEO duality exaggerates REM. Similarly, a recent study by Uddin (2023) found a positive correlation between CEO dual functions and REM in Bangladesh. Consistent with this, Oussii and Klibi (2023) reported that CEO duality enhances power and managerial entrenchment, which may lead to earnings management reporting positive earnings. In contrast, Chelogoi (2017) concluded that CEO duality restricts the practice of EM in Kenya. Moreover, some studies have not found any effect of CEO duality on EM (Abed et al., 2012; Bataineh et al., 2018; Chouaibi et al., 2018; Visvanathan, 2008). Based on the theoretical arguments and the outcomes of earlier research, the following hypotheses can be developed: -

H1.1 : Separating positions of CEO and Chairman has a negative connection with AEM.

H1.2 : Separating positions of CEO and Chairman has a negative connection with REM.

4.1.2. *CEO gender*

Agency theory argues that male CEOs may have stronger incentives to engage in EM due to their desire to maximize their own personal wealth and power. This theory proposes that male CEOs may be more focused on short-term gains and more willing to engage in EM practices to meet financial targets and boost their compensation (Jensen & Meckling, 1976; Zalata et al., 2022). Also, agency theory argues that control mechanisms can be improved and parties' interests can be aligned by appointing women to management positions (Ginesti et al., 2018). Also, the upper echelons theory argues that the demographic characteristics of top executives, such as gender, can shape their values, attitudes, and experiences, which can influence their strategic decisions and behaviors (Hambrick & Mason, 1984). Consequently, those characteristics ultimately affect their behavior and propensity for EM. Consistent with those theories, evidence from previous studies generally confirms that having women on corporate boards can enhance the quality of earnings, as they possess better monitoring skills (Githaiga et al., 2022; Zalata, Ntim, et al., 2019; Zalata, Ntim, et al., 2019; Zalata et al., 2022). This can be explained by the fact that women avoid risks and are more ethical compared to men (Barua et al., 2010). Empirical studies support this argument as they document that men are more overconfident and that firms led by men CEOs experience more systematic and idiosyncratic risks than firms led by women (Belot & Serve, 2019; Faccio et al., 2016; Muhammad et al., 2022; Peni et al., 2010). However, some argue that discernible variations in financial reporting practices between male and female CEOs could be attributed to the fact that female CEOs tend to be more risk-averse than their male counterparts

but not necessarily more ethically attuned (Zalata, Ntim, et al., 2019). Additionally, prior research has suggested that businesses led by women have a higher level of monitoring, which benefits the accuracy of financial reporting (Belot & Serve, 2019).

A previous study has examined the effect of the gender of the CEO on EM, and they have reported contradictory findings. For instance, Qi et al. (2018) proved that female executives have a lower propensity to participate in AEM and REM than their male counterparts. Also, research conducted by Gavius et al. (2012) and Belot and Serve (2019) discovered that EM is reduced when a woman serves as CEO. Also, Zalata, Ntim, et al. (2019) discovered that female directors in monitoring positions in US companies can reduce managerial opportunism, as determined by discretionary accruals. Similarly, a recent study by Altarawneh et al. (2022) proved that female CEOs are more rigorous in improving their strategic decisions and are less likely to engage in EM in the Malaysian market.

On the contrary, the experimental study was conducted in the Nigerian market by (Musa et al., 2023). They proved unusual evidence that the percentage of women as CEOs encouraged the practice of REM. However, studies done by Alqatamin et al. (2017), Lakhali et al. (2015), and Peni et al. (2010) failed to find any confirmation of a correlation among the gender of the CEO and EM. Therefore, it is important to note that very few studies investigate the connection among CEO gender and EM, and the vast majority of these investigations concentrated on AEM, except the research conducted by Qi et al. (2018) in China. Thus, according to the previous discussion, we can suggest the following hypotheses:

H2.1 : The association between male CEOs and AEM is positive.

H2.2 : The association between male CEOs and REM is positive

4.1.3. CEO education

Education is considered one of the most important demographic characteristics, which has recently garnered some prominence in the literature on corporate governance (Le et al., 2020; Makhoul et al., 2017; Qi et al., 2018; Taleatu et al., 2020). It is one of the most important elements that contribute to the advancement of management skills in the companies where managers work, and it reflects a person's cognitive capacity and expertise (Hambrick & Mason, 1984). The upper echelons theory literature argues that the education level reflects the CEO's skills and abilities. Thus, high-level education of managers means that managers are more informed and capable of managing information and making decisions (Hambrick & Mason, 1984). Additionally, the level of education enhances a CEO's potential and knowledge, demonstrating a positive connection between managerial capability and the performance of the business (Cheng et al., 2010). There is also the viewpoint that managers with advanced degrees, such as a doctorate or a master's degree, are more likely to function as strategic resources due to the fact that they possess a more diverse set of skills and capabilities that will assist them in carrying out their responsibilities (Makhoul et al., 2017).

In general, having a high education level is associated with having an open mind, being able to comprehend change, and being rationally competent (Hambrick & Mason, 1984). Therefore, the CEO's education level affects the CEO's decisions related to the financing and investment process (Buyl et al., 2011). Moreover, the financial reporting in companies with CEOs' higher educational levels is characterized as high quality, thus, lessening the cost of capital and improving company value (Le et al., 2020).

Very few studies have been investigated concerning the connection between the degree of education held by the CEO and EM. For example, according to Qi et al. (2018), executives who have completed greater levels of education are more likely to participate in AEM and have a

reduced likelihood of engaging in REM. Also, Le et al. (2020) discovered that businesses led by CEOs with advanced degrees in education are less likely to meet AEM. However, Taleatu et al. (2020) found that CFOs with high education related to high EM.

Based on the preceding debate, the ensuing hypotheses can be anticipated:

H3.1 : CEO education negatively affects AEM.

H3.2 : CEO education negatively affects REM.

4.1.4. CEO's age

The upper echelons theory argues that the demographic attributes for the leadership of a corporation, including age, have an impact on the way decisions are made and organizational outcomes (Hambrick & Mason, 1984). In this regard, researchers have paid a lot of attention to the age of the CEO because it is one of the most important demographic facts about the CEO (. Altarawneh et al., 2022; Belot & Serve, 2019; Bouaziz et al., 2020; Davidson et al., 2007; Le et al., 2020; Qi et al., 2018). Research in psychology and accounting has argued that age is linked with ethical behavior positively. Younger business professionals have less ethical faith than older business professionals. It is because older people pay more attention to customs, traditions, and culture, so they are more likely to be ethical (Le et al., 2020). Since younger CEOs are more apt to take risks, Serfling (2012) contends that older CEOs invest less than their younger counterparts. Also, Serfling (2012) argued that CEOs' ages substantially impact the companies' financial decisions, citing the example of young CEOs' preferences for using more debt and the reverse preference of older CEOs for having less debt.

There is a shortage of empirical investigations on the topic of CEO age and EM, particularly regarding REM, and the existing studies have produced mixed results. For instance, Davidson et al. (2007) demonstrated that companies with older CEOs, specifically those getting close to retirement, are associated with EM practices. It is because these CEOs care more about the performance of their corporations right now and are less concerned with the future in terms of maximizing their personal wealth or reward. Similarly, Belot and Serve (2019) found that CEO age adversely affects discretionary accruals. Qi et al. (2018) find similar results, demonstrating that older executives practice AEM and REM less frequently. More recently, Le et al. (2020) showed that older CEOs are more conservative and ethical, and they identified a negative link between CEO age and AEM. However, -some investigations found no connection between CEO age and AEM (Alqatamin et al., 2017; Altarawneh et al., 2022; Bouaziz et al., 2020; Qawasmeh & Azzam, 2020).

The preceding debate leads to the following hypotheses:

H4.1 : CEO's age affects AEM.

H4.2 : The CEO's age affects REM.

4.2. Family ownership concentration, the CEO demographic attributes, and EM

Family firms are typically characterized by higher ownership concentration, meaning that a small number of family members hold a significant percentage of the company's shares. In addition, family firms often have active family members involved on the board of directors or in key management positions (Al-Msiedeen & Al Sawalqa, 2021; Saidat et al., 2020). This can give the family more control over the company's decision-making and strategy and the managers' strong loyalty to the family and the business (Oussii & Klibi, 2023). The concentration of ownership and involvement of family members can lead to the alignment of the interest of owners and managers (decrease agency problem type I). However, this concentration will create conflicts of interest between family members and non-family shareholders, which is called agency problem type II.

According to the agency theory, in family businesses where ownership is concentrated among the family members, the majority of shareholders may seek to strip the rights of minority shareholders by practicing EM to achieve their interests and maximize their wealth (Cherif et al., 2020; Jensen & Meckling, 1976; Razzaque et al., 2016).

Researchers are increasingly interested in family company's financial report quality (Achleitner et al., 2014; Al-Begali & Phua, 2023; Al-Duais, Ali, et al., 2021; Alzoubi, 2016; Chi et al., 2015; Ghaleb et al., 2020; Tian et al., 2018; Tsao et al., 2019). They want to know how much family businesses take part in or stay away from the practice of EM. The literature offers two opposing viewpoints that could clarify how earnings management (EM) and family ownership concentration (FOWC) are related: alignment and entrenchment views (Wang, 2006). Ownership concentration (such as FOWC) leads to better monitoring by majority shareholders according to the alignment assumption (Rodriguez-Ariza et al., 2016; Wang, 2006). Thus, they might put a stop to the opportunistic behavior of the managers, which would result in a reduction in the use of EM since they care about the company's worth and reputation (Ghaleb et al., 2020; Rodriguez-Ariza et al., 2016; Tsao et al., 2019). Recent empirical research which conforms to the alignment assumption shows that family control can help in reducing EM since family enterprises use EM less frequently than non-family corporations (Achleitner et al., 2014; Al-Duais, Ali, et al., 2021; Alzoubi, 2016; Chi et al., 2015; Ghaleb et al., 2020; Tian et al., 2018; Tsao et al., 2019). Consequently, family businesses have high-quality financial reports compared to other businesses (Al-Duais, Ali, et al., 2021; Alzoubi, 2016; Ghaleb et al., 2020). However, a recent study in Jordanian market provides evidence that family companies limit the use of REM, but they manage earnings through discretionary accruals, which affects the QFR (Al-Begali & Phua, 2023). In the same, Alhmoed et al. (2023) discovered that the ownership concentration appears to limit REM, which is further enhanced by the presence of a CEO with experience, tenure, and political connections.

Furthermore, family businesses can promote relatives to senior management positions. Thus, it isn't easy to separate ownership from management whose families dominate them because the CEOs are the owners themselves in most cases, or the family members are the ones who appointed the CEO and thus, may influence the decisions of the CEO (Alhadab et al., 2020). According to the entrenchment effect, controlling shareholders have the authority to control managers' actions and force them to favor their interests over minority owners. Thus, it is expected that high family ownership may increase the power of the CEO; therefore, CEOs may seek to expropriate minority interests through the practice of EM in favor of the royal family because of their sense of loyalty to their families (Alhadab et al., 2020; Alqatamin et al., 2017; Wang, 2006). Recent empirical research conforms to the entrenchment assumption and shows that family ownership leads to greater engagement in EM (Alhebbri et al., 2020; Bataineh et al., 2018; Cherif et al., 2020; Chi et al., 2015; Eng et al., 2019; Razzaque et al., 2016). In this regard, Chi et al. (2015) found that the interaction between CEO duality and family companies increases EM. A recent study conducted by Oussii and Klibi (2023) provides evidence that family ownership increases the power of the CEO in practicing EM, especially when the CEO also holds the position of Chairman. Therefore, it is expected that in light of family concentrated ownership, the loyalty of the CEO is to the dominant family. Thus, the CEO may work to expropriate the rights of the minority in response to the desires of the controlling owners to maximize their wealth through the practice of EM.

According to the above discussion, the family's dominant shareholders will try to influence the CEO's behavior. Therefore, it is anticipated that the concentration of family ownership will be a moderator in the connection among CEO demographic attributes and EM. Consequently, the following assumptions can be developed:

H5.1: Family ownership concentration moderates the association between CEO demographics attributes and AEM.

H5.2: Family ownership concentration moderates the association between CEO demographics attributes and REM.

5. Research design

5.1. Sample selection and data collection

The population of this study consists of all Jordanian firms listed under the industrial and services sectors on the Amman Stock Exchange (ASE) from 2017 to 2021, following the update of the Jordanian Corporate Governance Code (JCGC) in 2017. The banking and insurance sectors were excluded because of the unique structure of their financial reporting and are subject to peculiar CGC (Abed et al., 2012; Al-Begali & Phua, 2023; Al-Haddad & Whittington, 2019). Companies with missing data were also excluded from industrial and services companies, which equals 56 companies. Thus, the final sample consists of 137 companies (685 firm-year observations), as shown in (Table 1). Annual reports on the ASE website and the Securities Depository Center (SDC) are the primary data source in the Jordanian market. Thus, this study depends on the Amman Stock Exchange (ASE) and the Securities Depository Center (SDC) to get the data related to AEM, REM, CEO demographic attributes, family ownership, and the control variables.

5.2. Measurements of variables

5.2.1. Measurement of the dependent variable (EM)

The dependent variable is earnings management (EM). The current study measures EM by Accrual-based earnings management (AEM) and real earnings management as follows:

5.2.1.1. *Accrual-based earnings management (AEM) measurement.* Discretionary accruals (DA) are frequently used as a surrogate for EM. Following the previous study, we used the modified Jones model to compute performance-adjusted discretionary accruals, which included return on assets (Kothari et al., 2005). DA = total accruals (TAC) - non-discretionary accruals. However, net income (NI) minus the cash flows from operations (CFO) will yield the total accruals. Therefore, DA is the absolute value of residuals in the design model by Kothari et al. (2005). This model is estimated cross-sectionally annually for each industry in the manner described.

$$\frac{TAC_t}{Assets_{t-1}} = \beta_1 \left(\frac{1}{Assets_{t-1}} \right) + \beta_2 \left(\frac{\Delta REV_t - \Delta REC_t}{Assets_{t-1}} \right) + \beta_3 \left(\frac{PPE_t}{Assets_{t-1}} \right) + \beta_4 ROA + \varepsilon_t \quad (1)$$

Table 1. Sample of the Study

Sector	Banking	Insurance	Service	Industry	Total
population	16	23	140	56	235
Exclusion: Banking and insurance sectors	(16)	(23)	-	-	(39)
Total service and industry companies	0	0	140	56	196
Minus: missing data of companies			(36)	(23)	(59)
The final sample of the study	0	0	104	33	137
Observation	0	0	520	165	685

In order to take into account outliers, every variable is winsorized at the top and bottom 3%, and all variables are defined as shown in Table 2.

5.2.2. Real earnings management (REM) measurement

This article uses Roychowdhury's model has been broadly used in previous investigations (Al-Haddad & Whittington, 2019; Cohen et al., 2008; Ghaleb et al., 2020; Razzaque et al., 2016; Roychowdhury, 2006). According to Roychowdhury (2006), three operational activities serve as the measures for REM. The first operational activities are abnormal cash flow from operations (ACFO). To determine the normal level of operations cash flow for each industry and each year, the subsequent cross-sectional regression is utilized:

$$\frac{CFO}{Assets_{t-1}} = \beta_1 \left(\frac{1}{Assets_{t-1}} \right) + \beta_2 \left(\frac{Sales_t}{Assets_{t-1}} \right) + \beta_3 \left(\frac{\Delta Sales_t}{Assets_{t-1}} \right) + \varepsilon_t \quad (2)$$

ε_t indicates to the residual from equation number (2), it is known as unusual cash flow from operations if it is high, meaning lower REM and vice versa.

The second operational activity is abnormal discretionary expenses (ADIE). These expenses are considered unusual discretionary expenses (ADIE) because they are less than the normal level expected to be reported, and it is a form of REM (Eng et al., 2019; Razzaque et al., 2016; Roychowdhury, 2006). To assess abnormal discretionary expenses, the next cross-sectional analysis is applied to every industry and every year:

$$\frac{DIE_t}{Assets_{t-1}} = \beta_1 \left(\frac{1}{Assets_{t-1}} \right) + \beta_2 \left(\frac{Sales_{t-1}}{Assets_{t-1}} \right) + \varepsilon_t \quad (3)$$

DIE denotes discretionary spending as the total advertising, SG&A, and R&D costs. The residual (ε_t) from the calculation (3) represents the abnormal discretionary expenditures, which means that the higher the residuals, the more discretionary spending companies decrease to boost reported profits. The third operational activity is abnormal production costs (APRC); to distribute fixed costs over many units produced, businesses or managers may try to produce more than the market requires or wants. It, in turn, reduces the costs of goods sold and thus, reports a high-profit margin (Roychowdhury, 2006). It means that production costs are abnormally higher than the level of nature. Production costs are a form of REM (Eng et al., 2019; Roychowdhury, 2006); it is possible to calculate them by adding the yearly percentage change in inventory to the cost of the items (goods) sold (Cohen et al., 2008; Roychowdhury, 2006). To forecast unusual cost of production, the next cross-sectional analysis is employed for every industry with the year:

$$\frac{PRC_t}{Assets_{t-1}} = \beta_1 \left(\frac{1}{Assets_{t-1}} \right) + \beta_2 \left(\frac{Sales_t}{Assets_{t-1}} \right) + \beta_3 \left(\frac{\Delta Sales_t}{Assets_{t-1}} \right) + \beta_4 \left(\frac{\Delta Sales_{t-1}}{Assets_{t-1}} \right) + \varepsilon_t \quad (4)$$

All variables related to the REM account are defined in Table 2. A higher APRC implies more REM practice (Eng et al., 2019; Roychowdhury, 2006). This article uses the overall REM measure by following previous studies (Eng et al., 2019; Roychowdhury, 2006), multiplying the residuals (ACFO and ADIE) by (-1), and adding the results to APRC as the following:

$$REM = ACFO * (-1) + ADIE * (-1) + APRC$$

5.2.3. Measurement of independent variables (CEO demographic attributes)

CEO demography attributes are independent variables. This research evaluates four independent variables: CEO non-duality, CEO gender, CEO education, and CEO age. CEO non-duality is called if the position of CEO and Chairman are separate, and it is measured as the dummy variable equals "1" if the chairman and CEO jobs are separate and "0" if not (Chandren et al., 2021). CEO gender is the dummy variable that equals "1" if the CEO is a man and "0" if otherwise (Belot & Serve, 2019; Musa et al., 2023; Zalata et al., 2022). CEO education is the dummy variable that equals "1" if CEO has a postgraduate degree (master's or Ph.D.) and 0" otherwise (Le et al., 2020; Qi et al., 2018).

Table 2. Measurement variables

Acronyms	Variable	Measurement
Dependent variables		
EM	Earnings management	indicates to earnings management proxy either accrual (AEM) or real (REM)
AEM	Accrual-based earnings management	the absolute value of residuals in the model of Kothari et al. (2005), as shown in Equation 1, represents the discretionary accruals.
REM	Real earnings management	the total of abnormal cash flow from operations (ACF*-1), abnormal discretionary expenses (ADIE*-1), and abnormal production costs (APRC) represents the aggregate value of REM
Independent Variables		
CEOSEP	CEO non-duality	The dummy variable equals “1” if the chairman and CEO jobs are separate and “0” if not.
CEOGD	CEO gender	The dummy variable equals “1” if the CEO is a man and “0” if otherwise
CEOEDU	CEO education	The dummy variable equals “1” if CEO has a postgraduate degree (master’s or Ph.D.), and 0” otherwise.
CEOAG	CEO age	How old is the CEO of a particular company during the research years?
Moderator variable		
FOWC	Family ownership Concentration	members of the same family possess at least 20% of the corporation’s shares
Control variables		
FSIZE	Firm size	natural logarithm of the sum of the assets of a business
LEV	Financial Leverage	the percentage of total debt to total assets
MKTB	Company Growth	The proportion of the company’s market value to its book value
ROA	Return on assets	Net income/the entire assets
COV	COVID-19	The dummy variable takes a value of “1” for the years of the COVID-19 outbreak (2020 and 2021), and “0” otherwise.
Others variables		
NI_{it}		Net income
CFO_{it}		Cash flows from operations
TAC_{it}	The total accruals	They are calculated by net income (NI_{it}) - cash flows from operations CFO_{it}
$ACFO_{it}$	Abnormal Cash flows from operations	The actual cash flow from operations - the estimated normal cash flow from operations results from Equation 2, or Abnormal cash flows from operation = ϵ_{it} , which results from Equation 2

(Continued)

Acronyms	Variable	Measurement
$Assets_{it-1}$	Total assets	The total assets of the company at the end of the previous year (t-1)
ΔREV_{it}		Change in revenues.
ΔREC_{it}		Change in accounts receivables.
PPE_{it}		gross property, plant and equipment of the company
ϵ_{it}	Error term	The residual of the equation (indicates earnings management)
$Sales_{it}$		The annual sales.
$\Delta Sales_{it}$		Change in sales.
DIE_{it}	discretionary expenses	The sum of advertising, SG&A, and R&D expenditures
$ADIE_{it}$	Abnormal discretionary expenses	The actual discretionary expenses - the estimated discretionary expenses result from Equation 3), or abnormal discretionary expenses = ϵ_{it} , which results from Equation (3) (Eng et al., 2019; Razaque et al., 2016; Roychowdhury, 2006).
$Sale_{it-1}$		Sales of last year
$\Delta Sales_{it-1}$		Change in sales in the last year
PRC_{it}	production costs	the cost of goods sold + the change in inventory during the year (Cohen et al., 2008; Roychowdhury, 2006).
$APRC_{it}$	Abnormal production costs	The actual production costs - the estimated production costs result from Equation 4), or abnormal production costs = ϵ_{it} in Equation 4
$\theta_1, \theta_2, \theta_3, \theta_4, \dots$		estimate parameters
Industry fixed effects		The industry dummies.
Year fixed effects		The year dummies.

CEO age indicates the old of the CEO of a particular company during the research years (Alqatamin et al., 2017; Altarawneh et al., 2022; Bouaziz et al., 2020; Qawasmeh & Azzam, 2020). All these variables are definite in Table (2).

5.2.4. Control variables measurement

We followed earlier research (Altarawneh et al., 2022; Eng et al., 2019; Ghaleb et al., 2020; Qawasmeh & Azzam, 2020; Razaque et al., 2016; Roychowdhury, 2006) and used firm size (FSIZE), financial leverage (LEV), Company Growth (MKTB), and return on assets (ROA) as the control variables. Furthermore, previous studies found that COVID-19 affected EM (Al-Begali & Phua, 2023; Ali et al., 2022; Azizah, 2021; Lassoued & Khanchel, 2021; Liu & Sun, 2022). Thus, to address the potential impact of COVID-19 on the results, we introduced a dummy variable (COVID-19) as an additional control variable in our regression models. This variable takes a value of “1” for the period during the COVID-19 outbreak (2020-2021) and “0” for the period before the outbreak (2017-2019). Moreover, to account for potential industry and year effects, we included sector type and year indicator variables in our regression models.

5.2.5. Moderator variable measurement

The present study employs family ownership concentration (FOWC) as both an independent and moderating variable to explore its effect on the relationship between CEO demographic attributes and EM. FOWC is measured as the percentage of the company's total shares owned by members of the same family, with a threshold of at least 20%. Additionally, family ownership is measured as a dummy variable, taking a value of "1" if members of the family already own at least 20% of the company's shares and "0" otherwise, consistent with prior research (Al-Begali & Phua, 2023; Bataineh et al., 2018; Ghaleb et al., 2020).

5.3. Regression model

The aim of this paper is to investigate how the level of earnings management (EM) in industrial and service companies operating in Jordan is influenced by the demographic attributes of the CEO and the concentration of family ownership, and it uses the following model:

$$EM_{it} = \beta_0 + \beta_1 CEOSEP_{it} + \beta_2 CEOGD_{it} + \beta_3 CEOEDU_{it} + \beta_4 CEOAG_{it} + \beta_5 FOWC_{it} + \beta_6 COV_{it} + \beta_7 FSIZE_{it} + \beta_8 LEV_{it} + \beta_9 MKTB_{it} + \beta_{10} ROA_{it} + \text{Industry fixed effects} + \text{Year fixed effects} + \varepsilon_{it} \quad (5)$$

This study also investigates the impact of the concentration of family ownership on the connection between CEO demographic attributes and EM (AEM & REM), and it uses the following model:

$$EM_{it} = \beta_0 + \beta_1 CEOSEP_{it} + \beta_2 CEOGD_{it} + \beta_3 CEOEDU_{it} + \beta_4 CEOAG_{it} + \beta_5 FOWC_{it} + \beta_6 COV_{it} + \beta_7 FSIZE_{it} + \beta_8 LEV_{it} + \beta_9 MKTB_{it} + \beta_{10} ROA_{it} + \text{Industry fixed effects} + \text{Year fixed effects} + \varepsilon_{it} \quad (6)$$

All the dependent, independent, moderate, and control variables are defined in Table 2.

6. Empirical results and discussions

6.1. Descriptive statistics

Table 3 Panel(A) presents descriptive statistics for the EM proxies (AEM and REM) and other continuous variables. AEM and REM have means of 0.0612 and -2.01e-10, respectively. Our sample's mean family ownership concentration (FOWC) is 20.30 percent, ranging from 0 to 85.2 percent. Also, the results of Panel (A) demonstrate the mean CEO age equals 52.318, the youngest CEO in this sample was 22 years old, and the oldest CEO was 86 years old. Regarding the gender of the CEOs, it is noted that 92.55% of the CEOs are male. In comparison, 7.45% of the CEOs are female, indicating that most Jordanian businesses sampled have male CEOs. Also, the CEO education (CEOEDU) results in Panel (B) reveal that 28.18 percent of Jordanian companies have CEOs with postgraduate degrees.

The study's control variables show that the average company size (FSIZE) is 16.969, while the average leverage ratio is approximately 30%. The mean market-to-book value (MKTB) is 1.037, and the mean return on assets (ROA) is 0.06%, suggesting that the companies, on average, are not profitable. Panel (B)' results demonstrate that the number of observations during the pandemic period is 274, representing 40% of the overall observations, and 411 observations before the pandemic, which means 60% of the total observations. Also, Panel(B) shows the rest of the CEO demographic attributes, as it shows that 94.89% of Jordanian companies follow corporate governance rules and that the jobs of the CEO and Chairman should be kept separate (CEOSEP). However, 5,11 % of Jordanian companies still have one person serve as both CEO and Chairman.

6.2. Diagnostic tests

Diagnostic tests are performed on the data to validate the regression assumptions prior to starting the regression. To ensure unbiased statistical inference in presenting the results, homoscedasticity and autocorrelation test were conducted, which are covered in more detail in the following:

Table 3. descriptive statistics

Panel (A) Continuous variables’ descriptive statistics

Variable	Obs	Mean	Std	Min	Max
AEM	685	0.0612	0.105	0.001	1.727
REM	685	-2.01e-10	0.202	-.2.158	0.997
FOWC	685	0.203	0.233	0.000	0.852
CEOAG	685	52.318	11.607	22	86
FSIZE	685	16.969	1.498	12.792	21.132
LEV	685	0.303	0.245	0.001	1.349
MKTB	685	1.037	0.849	0.227	3.536
ROA	685	0.0006	0.0776	-0.541	0.407

Note. AEM = abnormal discretionary accruals, REM = the combined values of the three REM models (ACFO*-1 + ADIE*-1 +APRC), FOWC = Family ownership concentration, CEOAG = age of Chief executive officer, FSIZE = firm size, LEV = financial Leverage, MKTB = Company Growth equals the percentage of company’s market value to book value, and ROA = Return on assets.

Panel(B) Descriptive Statistics for Dichotomous Variable

Variables	Measurement	Fre	Percentage (%)
COV	“1” for the COVID-19 pandemic period (2020-2021)	274	40.00
	“0” otherwise	411	60.00
CEOSEP	“1” if the jobs of chair and CEO are distinguishable	650	94.89
	“0” otherwise	35	5.11
CEOGE	“1” if CEO is male	634	92.55
	“0” otherwise	51	7.45
CEOEDU	“1” if CEO has a postgraduate degree	193	28.18
	0” otherwise	492	71.82

Note: COV= COVID-19 pandemic, CEOSEP = The positions of CEO and Chairman are separate, CEOGE= CEO gender, and CEOEDU = CEO education.

6.2.1. Test of homoscedasticity

When dependent variables exhibit the same amount of variance as the range of independent variables, this is referred to as homoscedasticity (Hair et al., 2014). The dependent variable’s dispersion shouldn’t be confined to a small range of independent variable values. The relationship is described as heteroscedastic if the variance is different across values of the independent variables, thus, leading to the regression coefficients being inaccurately estimated and the estimations’ standard errors will bias (Baltagi, 2005). The current study tests the homoscedasticity of the regression models using the Breusch-Pagan/Cook-Weisberg test, as shown in (Table 4). The null hypothesis presupposes that the residuals’ variance is homogeneous. Since the p-value for the two models is less than 0.05, the result in (Table 4) suggests that there are heteroskedasticity issues (significantly).

6.2.2. Autocorrelation

When two or more variables are associated, autocorrelation occurs. The regression model supposes that each unit’s error term is independent of and unaffected by other units. The panel data model’s autocorrelation will skew the regression results and lead to inaccurate conclusions (Bai et al., 2021; Baltagi, 2005; Wooldridge, 2002). If the variables are shown to be autocorrelated, they must be taken into account because ignoring them would lead to a biased assessment of the statistical results (Bai et al., 2021; Vogelsang, 2012). The Wooldridge test was used in this investigation to find autocorrelation because both fixed and random effect models can use the Wooldridge test (Wooldridge, 2010). The null hypothesis states that no first-order autocorrelation exists if the probability F-value is less than 0.05. The null hypothesis is disproved, and the result shows that F-value is significant (p <0.05); thus, autocorrelation exists in our study, as shown in Table 5. In line with earlier research, the feasible generalized least squares (FGLS) estimation

Table 4. Breusch-Pagan/Cook-Weisberg test for heteroscedasticity

DVS	Chi2(1)	Prob > Chi2	Null(H0)
Model of AEM	9.42	0.0021	Rejected
Model of REM	46.46	0.000	Rejected

Table 5. Wooldridge test for Autocorrelation in Panel Data

DVS	F (1,136)	Prob >F	Null(H0)
Model of AEM	67.378	0.000	Rejected
Model of REM	4.807	0.0307	Rejected

method will be used in this study to solve the issue of heteroskedasticity and autocorrelation in the panel data (Al-Begali & Phua, 2023; Al-Duais, Ali, et al., 2021; Bai et al., 2021; Bouaziz et al., 2020; Ghaleb et al., 2020; Kouaib & Jarboui, 2014; Le et al., 2020). Also, we control the potential effect of any outliers by winsorized at the 3% and 97% levels.

6.3. Correlation analysis (univariate test)

The amount and direction of the bivariate correlation between EM (AEM and REM), CEO demography attributes, FOWC, and control variables were determined employing the Pearson correlation analysis, as illustrated in (Table 6), panels A and B. The connection between FSIZE and LEV is the highest (0.468). Thus, the current study has no significant multicollinearity problems because the coefficients are less than 90% (Gujarati & Porter, 2009). Generally, it is crucial to remember that correlation analysis mainly assesses the link between two factors (Cramer & Howitt, 2004), not the combined impact of numerous variables on EM (AEM and REM). Hence, multivariate analysis is the superior technique for identifying the role of CEO demographics attributes and family ownership concentration in preventing or engaging in EM. As demonstrated in the following section, multivariate regression analysis serves as a methodological basis for assessing the study hypotheses and as additional proof of the link between variables.

6.4. Multivariate regression results

This section presents the results of the regression analysis conducted to test the study's hypotheses.

6.4.1. *The impact of the CEO demography attributes and family ownership concentration on EM* (Table 7) summarizes the conclusions of the regression analysis on the impact of CEO demographic attributes and family ownership concentration (FOWC) on EM, as suggested by hypotheses H1, H2, H3, and H4. We run two regressions for AEM and REM. The Wald chi-square test yields an extremely significant value, suggesting that the models are accurate and can be used to explain how EM differs. The CEO non-duality (CEOSEP) was correlated with AEM but insignificantly ($\beta = -.003$, t-value: - 0.54, p-value > 0.10), as shown in Table (7). It contradicts the proposed hypothesis of a significant inverse association between CEOSEP and AEM. Thus, H1:1 is rejected. The outcome of our study is consistent with the findings of earlier research (Abed et al., 2012; Al-Haddad & Whittington, 2019; Bataineh et al., 2018), which revealed no significant association between CEO duality and AEM.

However, the results indicate that a CEO non-duality (CEOSEP) is significantly and negatively associated with (REM) at a 1% significance level ($\beta = -.031$, t-value = - 4.83, $p < 0.01$). This evidence validates the assumption that REM is more difficult to implement when the roles of CEO and Chairperson are kept separate. It agrees with the hypothesis that CEOSEP and REM are negatively correlated. Thus, H1:2 is admissible. This finding is consistent with the assumptions of agency theory, which emphasizes that separating the CEO and Chairman positions can improve monitoring

Table 6. Correlation Matrix

Panel (A) AEM											
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) AEM	1.000										
(2) CEOSEP	-0.014	1.000									
(3) CEOGE	0.023	-0.066*	1.000								
(4) CEOEDU	-0.028	-0.002	0.116***	1.000							
(5) CEOAG	0.084**	-0.011	0.110***	-0.029	1.000						
(6) FOWC	0.136***	0.104***	0.033	0.031	0.006	1.000					
(7) COV	-0.14**	0.027	-0.018	0.019	0.034	0.007	1.000				
(8) FSIZE	-0.101***	0.273***	0.116***	0.175***	0.084**	-0.017	-0.017	1.000			
(9) LEV	0.098**	0.121***	0.129***	0.118***	0.063*	-0.148***	0.037	0.468***	1.000		
(10) MKTB	0.134***	-0.095**	0.018	-0.098**	0.022	0.007	0.046	-0.068*	0.075**	1.000	
(11) ROA	0.062*	0.143***	0.024	0.042	0.071*	0.110***	-0.044	0.196***	-0.165***	0.076**	1.000

*** if 'p' less than 0.01, ** if 'p' less than 0.05, * if 'p' less than 0.1

Panel (B) REM											
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) REM	1.000										
(2) CEOSEP	-0.091**	1.000									
(3) CEOGE	0.039	-0.066*	1.000								
(4) CEOEDU	-0.044	-0.002	0.116***	1.000							
(5) CEOAG	-0.082**	-0.011	0.110***	-0.029	1.000						
(6) FOWC	-0.156***	0.104***	0.033	0.031	0.006	1.000					
(7) COV	0.10**	0.027	-0.018	0.019	0.034	0.007	1.000				
(8) FSIZE	0.010	0.273***	0.116***	0.175***	0.084**	-0.017	-0.017	1.000			
(9) LEV	0.07*	0.121***	0.129***	0.118***	0.063*	-0.148***	0.037	0.468***	1.000		
(10) MKTB	-0.237***	-0.095**	0.018	-0.098**	0.022	0.007	0.046	-0.068*	0.075**	1.000	
(11) ROA	-0.369***	0.143***	0.024	0.042	0.071*	0.110***	-0.044	0.196***	-0.165***	0.076**	1.000

*** if 'p' less than 0.01, ** if 'p' less than 0.05, * if 'p' less than 0.1.

and control over the activities of executive directors (Fama & Jensen, 1983). This conclusion aligns with the findings of Al-Haddad and Whittington (2019), Kharashgah et al. (2019), Uddin (2023), and Oussii and Klibi (2023), who proved evidence that combining the position of CEO and chairman in one person increases the power of CEO in practicing REM and decrease the efficiency of the board director's oversight. These results also support the Jordanian Corporate Governance Code requirement, which emphasizes the separation of the CEO and Chairman positions.

However, the relationship between CEO gender (CEOGE) and AEM showed no statistically meaningful correlation ($\beta = 0.002$, t -value = 0.56, p -value > 0.10). Likewise, our outcome shows no connection between CEO gender (CEOGE) and REM ($\beta = 0.005$, t -value = 0.58, p -value > 0.10). These outcomes do not corroborate the idea that suggests males make high-risk decisions and encourage the practice of EM. Consequently, H2:1 and H2:2 are rejected. Our outcomes contradict the agency theory, which argues that male CEOs may have stronger incentives to engage in EM due to their desire to maximize their personal wealth and power. Additionally, our results do not support the upper echelons theory, which contends that the demographic attributes of top executives, such as gender, can shape their values, attitudes, and experiences, which can influence their strategic decisions and behaviors. However, these findings are in agreement with the results reported by Alqatamin et al. (2017), Lakhali et al. (2015), and Peni et al. (2010), who were unable to find any correlation between the gender of the CEO and EM. The insignificance of the connection between CEO gender and EM can be clarified because the Jordanian Corporate Governance Law does not obligate Jordanian companies to appoint women to senior positions as CEOs (Ghaleb et al., 2021). Thus, the appointment of women to senior positions is optional. Furthermore, Jordanian society is characterized by tribalism and tends to appoint males to senior administrative positions more often than females. This explains the low percentage of women employed as CEOs, which does not exceed 7.45%, indicating that diversity is almost non-existent.

The hypothesis related to CEO education (CEOEDU) predicts a negative link between CEOEDU and EM. However, the outcomes in Table 7 indicate a negative link between CEOEDU and AEM, but it is insignificant ($\beta = -0.002$, t -value = -0.66, p -value > 0.10). Likewise, our results show an insignificant relationship between CEOEDU and REM ($\beta = -0.004$, t -value = -0.87, p -value > 0.10). As a result, hypotheses H3:1 and H3:2 are rejected. Our findings do not support the upper echelons theory, which argues that the demographic attributes of top executives, such as education, can shape their values, attitudes, and experiences, influencing their strategic decisions and behaviors. Additionally, our outcomes are inconsistent with the findings of previous studies by Qi et al. (2018) and Le et al. (2020), who found that CEOs with higher education levels mitigated AEM. These results indicate that the CEO's education level does not significantly affect EM in the Jordanian markets, as shown in the descriptive statistics indicating that most executive managers do not hold a master's degree or a doctorate. This can be clarified because most Jordanian businesses are family-run and tend to appoint their relatives to senior positions regardless of their education or experience in the field.

Hypothesis H4 predicts that CEO age (CEOAG) significantly affects EM. The finding indicates that CEOAG is significantly positively linked to AEM at a 1% level ($\beta = 0.00009$, t -value = 3.74, p -value = 0.000). This finding provides support for Hypothesis 4:1 and suggests that older CEOs have a greater tendency to practice AEM. They may prioritize their personal gain from remaining with the business over the long-term interests of the owners (Davidson et al., 2007). Thus, they may engage in EM to achieve this goal. This conclusion is consistent with the upper echelons theory, which posits that the CEO's personal attributes, including age, can affect how the corporation creates value, makes decisions, and prepares its financial reports (Hambrick & Mason, 1984). However, these findings contradict those of Alqatamin et al. (2017) and Qawasmeh and Azzam (2020), who did not find a statistically significant correlation between CEO age and discretionary accruals. The difference in findings can be attributed to differences in the time and the sample studied. Table 7 shows that the t -value for the correlation between CEO age (CEOAG) and REM is -2.15, which is negative and statistically significant at the 5% level. This finding supports H4:2 and

Table 7. CEO demographic attributes, family ownership, and EM

Variable	AEM	REM
CEOSEP	-.003(-0.54)	-.031(-4.83) ***
CEOGE	.002 (0.56)	.005(0.58)
CEOEDU	-.002(-0.66)	-.004(-0.87)
CEOAG	0.00009(3.74) ***	-.0004(-2.15) **
FOWC	0.036(6.53) ***	-.048 (-3.99) ***
COV	-.004(-2.125) **	.007(2.52) **
FSIZE	-0.009(-9.29) ***	.0002 (0.11)
LEV	0.03(4.92) ***	.02 (1.79) *
MKTB	.007 (3.83) ***	-.025(-9.85) ***
ROA	0.025 (0.99)	-.532 (-10.64) ***
Constant	.168(9.51) ***	.087(2.49) **
Year	Yes	Yes
Industry	Yes	Yes
Observation	685	685
Wald chi2	190.513	406.872
Prob > chi2	0.000	0.000

*** if 'p' less than 0.01, ** if 'p' less than 0.05, * if 'p' less than 0.1.

demonstrates the importance of older CEO in limiting the scope of manipulable REM. This evidence is the same as the outcomes of Qi et al. (2018), who found that senior executives in the Chinese context are less probability to engage in REM as they age. This result supports the view that older executives prioritize their reputation and tend to avoid the practice of profit manipulation as they approach retirement age.

Table 7 demonstrates a positive and significant correlation between family ownership concentration (FOWC) and AEM, indicating that family-owned firms are more likely to engage in AEM. This conclusion is consistent with the assumption made by the entrenchment hypothesis, which indicates that high family ownership may incentivize controlled stakeholders to expropriate other stakeholders' (non-controlled) rights by EM. Furthermore, our results align with those of Alqatamin et al. (2017) and Bataineh et al. (2018). However, FOWC is inversely associated with REM, indicating that high family ownership restricts REM. This outcome corresponds with the outcomes of previous studies (Al-Duais, Ali, et al., 2021; Ghaleb et al., 2020; Tsao et al., 2019). Our result boosts the alignment hypothesis, which argues that high FOWC alignment the interests of the minority and majority owners and restricts EM.

In terms of control variables, the results show that COVID-19 has a significant negative correlation with AEM and a positive correlation with REM. These findings are consistent with recent investigations, which found that during the COVID-19 pandemic, corporations had limited opportunities to engage in AEM (Ali et al., 2022; Azizah, 2021; Liu & Sun, 2022) and had a higher incentive to practice REM (Ali et al., 2022). The firm's size (FSIZE) has a significant negative relationship with AEM. This finding suggests that larger Jordanian companies use less AEM than smaller ones. This result is in line with those of Bataineh et al. (2018) and Altarawneh et al. (2022). Additionally, the findings show that companies with high leverage and corporation growth (MKTB) engage in higher levels of AEM. This result is in line with previous investigations on AEM (Altarawneh et al., 2022; Bouaziz et al., 2020). Moreover, MKTB and return on assets (ROA) are negatively correlated with REM, suggesting that companies with high growth and profitability have less probability of practicing REM. These conclusions are consistent with the previous findings on REM (Alhmoed et al., 2023; Ghaleb et al., 2020).

6.4.2. *The impact of family ownership concentration on the association between CEO demographic attributes and EM*

This section presents the results of the regression related to investigating how family ownership concentration (FOWC) impacts the link between CEO demographic attributes (CEO non-duality, CEO gender, CEO education, and CEO age) and EM (AEM & REM). Table 8 shows that the interaction variable (FOWC*CEOSEP) has a positive and significant correlation with AEM, with a t-value of 3.76 at the 1% level, indicating that family ownership concentration (FOWC) positively moderates the weak (insignificant) correlation between CEO non-duality (CEOSEP) and AEM. This suggests that FOWC and its interaction with CEO non-duality (CEOSEP) may increase the practice of AEM. This conclusion is consistent with the predictions of the entrenchment hypothesis. Even though having separate CEO-Chairman roles can lead to a more effective board of directors, in the context of family-concentrated ownership, the CEO's loyalty is to the dominant family, which can influence the CEO's decision-making. As a result, the CEO may engage in AEM to expropriate the interest of the minority in response to the majority owners' desire to maximize their wealth. This outcome is inconsistent with the outcomes of previous investigations (Chi et al., 2015; Oussii & Klibi, 2023), which found increasing EM when there is interaction among CEO duality and family companies.

Regarding REM, (Table 8) finds a significant and negative association among the interaction variable (FOWC*CEOSEP) and REM at a 1% level (t-value = -3.01), indicating that FOWC moderates the relationship between CEOSEP and REM. This suggests that the interaction between CEOSEP and FOWC has strengthened the significant negative correlation with REM. These findings imply that FOWC and its interplay with CEOSEP may limit the potential to manage real activities. These findings align with agency theory, which suggests that CEO non-duality enhances the board of directors' effectiveness and restricts the manager's capacity to engage in EM. Additionally, our results align with the alignment hypothesis, which argues that high family ownership aligns the goals of both the majority and minority owners, improves monitoring, and restricts managers' behavior. However, our results are inconsistent with those of Alhmoed et al. (2023), who did not get any significant relationship between CEO duality and REM when they used ownership concentration as a moderator.

The results reveal a positive and significant correlation at the 5% level (t-value = 2.35) between the interaction variable (FOWC*CEOGE) and AEM, indicating that FOWC moderates the association between CEOGE and AEM. This suggests that FOWC and its interplay with CEO gender (CEOGE) may increase the practice of AEM. This conclusion is consistent with the predictions of the entrenchment hypothesis, as in the context of family concentrated ownership, male CEOs may prioritize the interests of the dominant family, as family owners can influence the CEO's decision-making. Thus, male CEOs may engage in AEM to confiscate the rights of the minority in response to the controlling owners' desire to maximize their wealth. These outcomes align with the findings of Tai (2017) and Alhebri et al. (2020), who found a positive link between family ownership and EM. However, the findings indicate that the interaction variable (FOWC*CEOGE) has an insignificant correlation with REM (t-value = 0.49), suggesting that family ownership concentration does not moderate the association between CEOGE and REM in the Jordanian market. This insignificance may be due to the small percentage of women appointed to the position of CEO, as we mentioned earlier.

A negative and statistically significant correlation exists between the interaction variable (FOWC*CEOEDU) and AEM at a 1% level (t-value = -4.97), implying that FOWC moderated the link between CEOEDU and AEM. Also, Table (8) shows a significant inverse link between (FOWC*CEOEDU) and REM at a 1% level (t-value = - 6.21). Both results suggest that the interaction between CEO education (CEOEDU) and family ownership (FOWC) has strengthened the negative correlation and transformed it from insignificant to significant concerning EM (AEM and REM). These findings suggest that the presence of FOWC and its interplay with CEOEDU may limit opportunities for manipulating EM. Furthermore, our results are consistent with the alignment hypothesis, which suggests that high family ownership aligns the objectives of all shareholders (majority and minority), creating better monitoring and restricting CEOs with high education from

Table 8. The moderating effect of family ownership on the association between CEO attributes and EM

Variable	AEM	REM
CEOSEP	-0.005(-0.84)	-0.003(-2.68) ***
CEOGE	0.001(0.22)	0.015(1.12)
CEOEDU	0.005 (1.42)	-0.002(-0.25)
CEOAG	0.00002(2.07) **	-0.001 (-3.48) ***
FOWC	0.194 (3.79) ***	-0.074(-5.21) ***
FOWC*CEOSEP	0.143(3.76) ***	-0.089(-3.01) ***
FOWC*CEOGD	0.04(2.35) **	0.024(0.49)
FOWC*CEOEDU	-0.056(-4.97) ***	-0.149(-6.21) ***
FOWC*CEOAG	0.001(2.22) **	0.007 (0.92)
COV	-0.005(-2.86) ***	0.011 (2.74) ***
FSIZE	-0.009 (-8.69) ***	0.002 (0.70)
LEV	0.026 (4.01) ***	0.016(1.14)
MKTB	0.007 (3.91) ***	-0.032(-8.04) ***
ROA	0.03 (1.21)	-0.614(-9.80) ***
Constant	0.185(10.14) ***	0.07(1.84) *
Year	yes	yes
Industry	yes	yes
Observation	685	685
Wald chi2	176.070	527.951
Prob > chi2	0.000	0.000

*** if 'p' less than 0.01, ** if 'p' less than 0.05, * if 'p' less than 0.1.

engaging in EM. Our results align with the results of Al-Duais, Ali, et al. (2021) and Ghaleb et al. (2020), who found that family-owned companies have incentives to impose high control on the behavior of managers and restrict the practice of REM.

(Table 8) shows a positive significant relationship between AEM and the interaction variable between FOWC and CEO age (FOWC*CEOAG) at a 5% level (t-value = 2.22), indicating that FOWC moderates the relationship between CEOAG and AEM. This suggests that the interplay between CEO age (CEOAG) and family ownership (FOWC) has strengthened the significant positive relationship with AEM, increasing the chances of manipulating EM (AEM). This conclusion is consistent with the predictions put forth by the entrenchment hypothesis, as in the context of family concentrated ownership, older CEOs may prioritize the interests of the dominant family, as family owners can influence the CEO's decision-making. Thus, older CEOs may engage in AEM to confiscate the rights of the minority in response to the majority owners' desire to maximize their wealth. However, the results indicate that the interaction variable between FOWC and CEO age (CEOAG) has an insignificant positive correlation with REM (t-value = 0.92, p-value = 0.356), suggesting that FOWC does not affect the association among CEOAG and REM.

7. Additional analysis and robustness tests

7.1. Further analysis for alternative measures for earnings management

In order to ensure the dependability of our results, we utilized different indicators to assess AEM and REM in our study. Specifically, we employed the Jones model (1991) and the Modified Jones model (1995) to calculate discretionary accruals, and as part of the robustness test, we used two sub-aggregate measures, REM1 and REM2, instead of the overall REM (REM-ALL) measure. We

conducted additional regression analyses to explore the alternative estimates of REM, as REM1 consists of APRC plus ADIE, and REM2 consists of ACFO plus ADIE. As a result, we conducted a new regression analysis to examine the alternative estimates of EM. (Table 9) summarizes the regression analysis findings for the alternative EM measurements. Under both models of AEM (Jones 1991 and Modified Jones 1995), the results show the same main findings, suggesting that FOWC*CEOSEP, FOWC*CEOGD, and CEOAG are positively and significantly related to AEM. However, Table (9) illustrates the significant negative correlation between FOWC*CEOEDU and AEM. Furthermore, Table (9) results indicate that FOWC*CEOSEP, FOWC*CEOEDU, CEOSEP, and CEOAG are negatively and significantly correlated with REM1 & REM2. In summary, the additional investigation results suggest that they align with the primary results, and the degree of significance varies between 1% and 5%.

7.2. Test of multicollinearity

We computed the variance inflation factors (VIFs) to check for multicollinearity. According to Hair et al. (2014), when the VIF value exceeds 10, that means multicollinearity. In our investigation, all VIF values were below 2. Therefore, our research has no multicollinearity issues according to the VIF test, as shown in (Table 10).

7.3. Test of endogeneity

Endogeneity, which develops due to concurrent results, explanatory variables, and omitted factors, is prevalent in accounting research (Al-Duais , Qasem, et al., 2021) . It refers to the association between an explanatory variable and the error term in the regression equation. Ignoring endogeneity may result in skewed parameter estimations and invalid conclusions. In our initial regression, we correlated the level of EM with CEO demographic attributes. However, these findings may be skewed due to endogenous matching between CEO demographic

Table 9. Robustness check using Alternative measures for AEM and REM

Variable	AEM		REM	
	Jones	Modified Jones	REM1	REM2
CEOSEP	-.006(-0.95)	-.005 (-0.89)	-.017(-2.14) **	-.028(-4.95) ***
CEOGE	.0004(0.13)	.001(0.16)	.001(0.14)	.01(0.97)
CEOEDU	-.00003(-0.25)	-.00003(-0.28)	-.007(-1.88) *	-.007(-1.70) *
CEOAG	.006(2.27) **	.006(2.26) **	-.001(-3.02) ***	-.001(-3.90) ***
FOWC	.187(3.65) ***	0.188 (3.69) ***	-.024(-2.74) ***	-.055(-6.85) ***
FOWC*CEOSEP	.135(3.52) ***	.136(3.55) ***	-.108(-5.32) ***	-.054(-2.47) **
FOWC*CEOGD	.039(2.34) **	.04(2.37) **	.028(1.09)	.028(0.87)
FOWC*CEOEDU	-.055(-4.89) ***	-.055(-4.97) ***	-.057(-3.46) ***	-.027(-2.15) **
FOWC*CEOAG	.001(2.19) **	.001(2.24) **	.002 (1.19)	.001(1.39)
COV	-.005(-2.70) ***	-.005(-2.79) **	.006(2.54) **	.01(3.46) ***
FSIZE	-.009(-8.46) ***	-.009(-8.74) ***	.0005(0.36)	.003(1.63)
LEV	.025(3.99) ***	.026(4.02) ***	.007(0.90)	-.018(-1.85) *
MKTB	.007(3.68) ***	.007(3.79) ***	-.011(-4.72) ***	-.021(-9.27) ***
ROA	.035(1.43)	.034(1.41)	-.244(-7.34) ***	-.396(-10.55) ***
Constant	.184(10.00) ***	.187(10.28) ***	.059(2.38) **	.055(1.79) *
Year	yes	yes	yes	yes
Industry	yes	yes	yes	yes
Observation	685	685	685	685
Wald chi2	163.145	175.735	203.068	402.016
Prob > chi2	0.000	0.000	0.000	0.000

*** if 'p' less than 0.01, ** if 'p' less than 0.05, * if 'p' less than 0.1.

Table 10. Test of multicollinearity (VIF)

	VIF	1/VIF
FSIZE	1.544	.648
LEV	1.492	.67
ROA	1.189	.841
CEOSEP	1.135	.881
CEOEDU	1.063	.94
MKTB	1.063	.941
CEOGE	1.056	.947
FOWC	1.05	.952
CEOAG	1.029	.972
COV	1.01	.99
Mean VIF	1.163	.

attributes and EM practices. In such circumstances, the causality may shift from EM (AEM & REM) to CEO demographic characteristics or vice versa. Therefore, we cannot overlook the inverse link and must address the crucial test for endogeneity. Endogeneity arises when the dependent variables (such as AEM and REM) are impacted by factors affecting the independent variables, such as CEO demographic attributes.

Prior investigations have tested the potential impact of endogeneity in two ways. The first approach, which has been extensively utilized, lagged independent variables (Al-Duais, Qasem, et al., 2021; Chandren et al., 2021; Ghaleb et al., 2021). In this approach, they re-examined the primary analysis using this technique by regressing the one-year lagged value of all independent and control variables on EM. They argued that if the results are almost the same as the main regression results, it demonstrates that endogeneity is absent from our models. The second approach for addressing endogeneity uses an instrumental variables approach that depends on the two-stage least square (2SLS) method. In our investigation, following previous studies, we employed both the lagged values of the endogenous variables and the two-stage regression (2SLS) technique test as instruments (Alzoubi, 2016; Bouaziz et al., 2020; Uddin, 2023). All variables were designated as endogenous in this test. We then used the Durbin-Wu-Hausman test, which defines endogeneity as a P-value $\leq .05$, to determine whether there is any endogeneity bias for the independent variables (CEO demographic attributes). The Durbin Wu-Hausman test findings were non-significant at a 5% level, as shown in (Table 11), proving that our models are free from endogeneity bias.

8. Conclusion

The current study investigates the impact of CEO demographic attributes on EM (AEM & REM) and whether family ownership concentration moderates that association. Data from 137 enterprises listed on the Amman Stock Exchange from 2017 to 2021, excluding the banking and insurance sector, is utilized. This study applies feasible generalized least squares estimation (FGLS) to achieve its objective. The results documented that CEO attributes, such as non-duality and age, restrict REM. However, the results show that older CEOs practice AEM. High family ownership moderates

Table 11. Tests of endogeneity: Durbin Wu-Hausman test

Tests of endogeneity

Ho: variables are exogenous

Variables	Durbin (score) chi2(4)		Wu-Hausman F (4,534)	
AEM model	1.23873	(p = 0.8717)	.302454	(p = 0.8763)
REM model	1.8492	(p = 0.7635)	.452014	(p = 0.7709)

the relationship between CEO demographic attributes and AEM. Specifically, when family ownership is combined with the CEO's non-duality, gender, and age, it increases the practice of AEM. However, when family ownership concentration interacts with CEO education, it limits the practice of AEM. The outcomes also find that family ownership concentration restricts REM when combined with CEO non-duality or CEO education.

Our study contributes to the corporate governance literature by presenting a complete picture of EM strategies by examining types of EM (AEM and REM). Therefore, the outcomes of this study add to the current body of knowledge by shedding light on the behavior of CEO with different attributes and their effects on the two types of EM. Our study discovered the extent of the impact of family ownership concentration on the link among the CEO's and EM's attributes, and it is considered a new addition that was not addressed in previous research. Thus, the results of this study will benefit decision-makers and stakeholders in the Jordanian market, which is characterized by the dominance of families and may assist in enhancing the quality of financial reports.

The study's outcomes have significant practical implications. Firstly, the findings indicate that Jordanian companies in the service and industry sectors have followed the rules of Jordanian corporate governance to some extent (94.89%) and have separated the CEO position from the position of Chairman. Accordingly, the current study found that CEO non-duality has strengthened the oversight role in restricting the practice of REM. Therefore, regulators and policymakers (such as the Jordanian Securities and Exchange Commission) may consider this result and encourage companies listed in ASE that separate the CEO and Chairman positions to continue doing so. Also, they urge other companies to avoid duality in order to improve the quality of financial reports. Thus, the results of this study may reassure investors that their investments are protected in companies where the role of the CEO is not dual because they restrict the practice of EM and producing high-quality financial reports. Secondly, previous studies have shown that female CEOs are more ethical and can help improve the quality of financial reports by restricting the practice of EM due to their risk-averse behavior. However, the Jordanian Corporate Governance Law does not require companies to appoint women to senior management positions as CEOs (Ghaleb et al., 2021). Our study found that only a small percentage of females (7.45%) occupy the CEO position in Jordanian industrial and service companies. Moreover, we found that male CEOs in family companies engage in AEM. Therefore, policymakers and regulators of the corporate governance code in Jordan must consider the need to appoint more women to senior management positions, as female CEOs may help improve the quality of financial reports. Thirdly, this study found that CEO age has two opposing effects directly on EM. While older CEOs restrict the practice of REM, they tend to engage in AEM, particularly in companies with high family ownership. Therefore, investors and shareholders should be cautious when dealing with companies that appoint older CEOs. Fourthly, this study provides evidence for the potential role of family ownership concentration in mitigating REM when it interacts with CEO non-duality and education. However, it also provides evidence for the potential role of family ownership concentration in engaging in AEM when interacting with CEO non-duality, gender, and age. Given that ownership concentration is dominant in Asian markets, such as Jordan, regulators or the ASE should recognize the significance of ownership concentration in reducing REM and increasing AEM and its impact on the QFR and the Jordanian economy. Hence, current and potential investors and shareholders can use the study's results to make informed investment decisions, especially given that profit is their primary focus. Managing profits may distort financial reports, misleading stakeholders about the company's actual performance, particularly in family companies that influence the behavior of executive managers. Therefore, these findings can make current and potential investors more cautious when investing in family businesses. In conclusion, this study's outcomes can help the board of directors, policymakers, and regulators to reconsider the criteria for appointing CEOs based on specific characteristics they must possess.

This study has identified some limitations, which suggest areas for further investigation. First, the current study covered only service and industrial enterprises registered on the Amman Stock Exchange.

As a result, it would be useful for future studies to extend this work to include other industries like banking and insurance, following the Jordanian corporate governance code, which was updated in 2017. Second, the current study focused only on family ownership concentration. Therefore, the other types of ownership concentration (managerial, foreign ownership, institutional, and government shareholders) may be useful for future research. Third, the current study was limited to certain CEO characteristics (CEO non-duality, gender, CEO education, and age). Therefore, future studies should look at other characteristics, such as religion (Muslim - Christian), CEO nationality, CEO tenure, CEO experience, CEO incentive, CEO ownership, CEO power, CEO compensation, and other characteristics). Finally, there is a limitation related to REM and AEM measurements. Many models exist that can measure accruals earnings management, but this study is limited to the cross-sectional model of Kothari et al. (2005). However, Jones (1991) and modified Jones (1995) were used in the robustness test. Additionally, three proxies were developed by Roychowdhury (2006) in this study to measure REM which was commonly employed in the literature on earnings management. Future studies could also investigate EM measurement as different models are applied in other studies, such as the modified Jones model by Yoon et al. (2006), which measures AEM as well as the measurement of REM by different models like the stock repurchase, selling fixed assets, and related-party transactions.

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