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Does earnings management mediate the relationship between audit quality and company performance? Evidence from Jordan

Audit quality
and company
performance

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Received 22 August 2021
Revised 15 November 2021
Accepted 30 November 2021

Abstract

Purpose – The purpose of this study is to look at the direct relationship between audit quality, earnings management (EM) practices and company performance, as well as the indirect influence (mediation) of EM practices in the relationship between audit quality and company performance. It offers empirical evidence from the Jordanian market, which is considered an emerging market.

Design/methodology/approach – The population of this study is represented in Jordanian service companies listed on the Amman Stock Exchange (ASE), with a total of 344 company-year observations. Furthermore, panel data analysis was used in this study, and data for the study were acquired from yearly reports as well as the ASE's database.

Findings – Based on generalized method of moments model, the present findings demonstrate that the size of the audit firm and the tenure of the audit firm have a positive and negative influence on EM practices, respectively, but that industry-specialist audit firm has a negative and insignificant effect. EM practices have a negative impact on two company performance proxies (ROA and ROE), but have no effect on earnings per share (EPS). Furthermore, the size of the audit firm has a positive and significant influence on the performance proxies of the company [i.e. return on assets (ROA) and return on equity (ROE)]. The presence of an industry-specialist audit firm has a positive and significant influence on two proxies of company performance (ROE and EPS), but a negative and significant impact on ROA. An audit firm's tenure has a negative and significant impact on two performance proxies (ROA and EPS), but a positive and significant impact on ROE. Then, EM practices either fully or partially mediate the relationship between audit quality proxies and company performance as assessed by ROA, ROE and EPS.

Research limitations/implications – The current study's limitation is that it only searched in Jordanian service companies listed on ASE from 2012 to 2019 to meet the study's objectives; thus, the authors recommend that future work investigate the study model for other sectors, whether in Jordan or other emerging markets such as the Middle East and North Africa. Another limitation of this study is that the study models lack important variables, which may affect EM and company performance, such as corporate governance and ownership structure characteristics; as a result, the authors recommend that future work includes such variables in future research models to have more explanations in this context.

Practical implications – Analysts, investors and other strategic decision makers may use the findings of this study to improve the efficiency and efficacy of Jordan's financial market. These findings will enhance policymakers' willingness to establish appropriate regulations, which might improve Jordan's financial market performance and efficacy. These findings may help investors make better judgments by using audit quality proxies and EM indicators, which can forecast business success.



JEL classification – M41, G40, G41, G32

Journal of Financial Reporting and
Accounting
© Emerald Publishing Limited
1985-2517
DOI 10.1108/JFRA-08-2021-0245

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Originality/value – First, this study distinguishes itself from prior studies through establishing a new research model, by investigating the mediating effect of EM in the relationship between audit quality and company performance. It provides empirical evidence from the Jordanian market; hence, it increases the body of the knowledge in this context. Second, to the best of the authors' knowledge, this is the first study to look into the link between audit quality, EM and company performance together; hence, the model of this study is developed using agency theory and information asymmetry theory. Third, the current study adds new evidence to the role of audit quality and EM in companies, as well as how audit quality and EM practices affect company performance in emerging markets such as Jordan.

Keywords Information asymmetry, Firm performance, Earnings manipulation, Audit firm size, Audit firm tenure, Industry-specialist audit

Paper type Research paper

1. Introduction

Companies' conduct has shifted as a result of globalization's impact on the global economy. Market development and intense competition push managers to use accounting manipulation strategies to manipulate accounting results to offer a perfect picture of a company's economic and financial status (Afifa *et al.*, 2021; Alzoubi, 2016, 2019). This is performed through the use of accounting standards' flexibility, or even by noncompliance, by modifying financial statements (Saleh *et al.*, 2020a). Furthermore, there are studies that warn of risk behaviors and the elements that lead to these deviant attitudes on the part of managers and administrators, culminating in accounting fraud, with consequences not only for the companies but also for present and potential investors (Alqirem *et al.*, 2020; Farouk and Hassan, 2014; Li, 2014; Phan *et al.*, 2020).

Earnings management (EM) is concerned with maximizing or decreasing returns to achieve certain side goals, such as tax evasion or otherwise demonstrating development in the company's potential to enhance the company's reputation with shareholders, creditors and other interested parties (Dempster and Oliver, 2019; Du and Shen, 2018; Li, 2014). EM may affect the consistency, impartiality and honesty of accounting information, decreasing the quality of information provided to users and, as a result, misinforming those users (Almarayeh *et al.*, 2020; Huynh, 2018).

Furthermore, with a number of companies engaged in financial scandals, the auditor's independence and the role of the external auditor in the companies were brought into question, casting doubt on the audit's quality. Several empirical investigations, however, have discovered a positive association between audit quality and financial reporting quality presented by publicly listed companies in the backdrop of many financial catastrophes (Alzoubi, 2016). Among these empirical investigations, a rising number of studies targeted EM particularly. Recent high-profile audit failures of companies have sparked interest in the nature, limitations and causes of EM. Habbash *et al.* (2013), Alzoubi (2016), Alqirem *et al.* (2020) and Saleh *et al.* (2020a) emphasized the importance of audit quality in EM, stating that EM focuses on hiding information from stakeholders, and audit quality helps to transmit real-time information to stakeholders and other users. Furthermore, Rusmin (2010) claimed that EM erodes investors' trust in the accuracy of financial reporting and obstructs the effective flow of money in financial markets, whereas Saleh *et al.* (2020b) claimed that audit quality improves investors' trust in the quality of financial reporting and assists them in making appropriate decisions. Auditors play an active role in the preservation and dissemination of high-quality financial reporting. As such, Alzoubi (2016) and Abu Afifa *et al.* (2020) showed a negative relationship between audit quality and EM. Chang and Sun (2009) also stated that governance policies and supervisory processes, in general, have a negative and positive impact on EM and the quality of accounting information, respectively.

Audit quality and company performance

At the same time, other researchers have concentrated on the influence of audit quality on company performance. According to some of them (Almarayeh *et al.*, 2020), good audit quality helps to enhance accounting information quality, aids in projecting future scenarios and boosts decision makers' capacity to make relevant and high-quality decisions (Easley and O'Hara, 2004). Jensen and Meckling (1976) established that the greater the audit quality, the lower the agency's costs, and, hence, the higher the company's performance. Auditors at large audit firms, for example, would be given extra incentives to detect management malfeasance because they would be more successful in restricting EM to protect their identities and avoid legal culpability (Chen *et al.*, 2011; Rusmin, 2010). This will also attempt to boost the company's performance (Elewa and El-Haddad, 2019).

Furthermore, independent auditors offer written recommendations to the audited company's board of directors and managers, which will assist them in improving working methods and techniques to increase a company's business effectiveness (Farouk and Hassan, 2014; Phan *et al.*, 2020). However, there is still a gap in the importance of audit quality in limiting EM practices and a company's performance, as other researchers have found no beneficial relationship between auditor tenure and profit sustainability (Allahkaram *et al.*, 2017), as well as no significant relationship between audit firm size and reduced EM practices (Allahkaram *et al.*, 2017). As a result, this study develops an econometric model of the direct association between audit quality, EM and company performance. More importantly, it looks at the role of EM as a mediator in the relationship between audit quality and company performance. It provides new empirical evidence from an emerging market (the Jordanian market), where previous studies on the relationship between these contexts have been conducted in developed markets, but comparatively few studies have been conducted in developing markets such as Jordan, which is the motivation for this study.

The call for external audit is almost always the outcome of agency concerns with ownership and control segregation and, because of knowledge imbalance between the principal and agent, agency concerns occur. The term "information asymmetry" refers to a scenario in which one party has a better understanding of company circumstances than the other (Schipper, 1989; Schipper and Vincent, 2003). The predominance of information asymmetry between managers (agent) and shareholders (principal) may result in EM because shareholders have inadequate incentive, access, or resources to pertinent information to monitor and control the manager's operations (Warfield *et al.*, 1995). Therefore, monitoring processes, according to agency theory, are expected to match managers' and shareholders' interests, eliminating conflict of interest and any opportunistic behavior that may occur. In more detail, agency theory indicates the auditing job serves as an important bonding component in companies (Arens *et al.*, 2010; Bataineh *et al.*, 2018), decreasing information asymmetry and conflicts of interest among managers and shareholders. As a result, the external auditing process is expected to function as a monitoring tool, reducing managers' incentives to manipulate earnings.

From a Jordan context, prior literature (such as Abdullatif and Al-Khadash, 2010; Al-Haddad and Whittington, 2019; Almasarwah, 2019; Shbeilat and Abdel-Qader, 2018) argued that personal ties rule Jordanian companies and influence auditor selection, reducing the quality and openness of their supervisory activities and, as a result, potentially contributing to increased EM practices. Other early literature (Alsufy *et al.*, 2020; Idris *et al.*, 2018) stated that the level of audit quality in Jordanian companies is low, which encourages managers to manipulate earnings. Furthermore, Jordanian companies continue to have a weak level of governance, as well as a lack of diversification and concentration of ownership (Almashaqbeh *et al.*, 2019; Alqirem *et al.*, 2020). According to Abbadi *et al.* (2016), Latif *et al.*

JFRA

(2017), Shbeilat and Abdel-Qader (2018) and Almarayeh *et al.* (2020), insufficient levels of auditing and monitoring (such as corporate governance) in MENA companies may have a detrimental effect on constraining their EM practices. This will limit these companies' ability to sustain high long-term performance, which is consistent with agency theory and information asymmetry theory.

Based on the preceding discussion, the following are the current study's contributions: First, it intends to look at the link between audit quality, EM and company performance. More crucially, it explores the role of EM as a mediator in the link between audit quality and company performance, seeking to fill a gap in the previous literature. Second, the model used in this study is based on agency theory and information asymmetry theory, which are both widely used in accounting research to characterize company and individual behavior (Jensen and Meckling, 1976; Waweru and Prot, 2018). As a result, this study aims to add to the body of knowledge in this context by providing empirical evidence from the Jordanian market as an emerging market, as there have been few attempts to examine this context in developing markets rather than in developed markets. Third, by concentrating on audit quality, the findings of this study reveal the variables that impact EM and company performance. The findings provide several explanations for the importance of audit quality in companies and how it influences EM and company performance.

The findings of this study, which used the generalized method of moments (GMM) model, revealed that audit firm size and audit firm tenure had a positive and negative influence on EM practices, respectively, whereas industry-specialist audit firm has a negative and insignificant effect. EM practices have a negative impact on two proxies of company performance [return on assets (ROA) and return on equity (ROE)], but have no influence on earnings per share (EPS). Furthermore, the size of the audit firm has a positive and significant influence on the performance proxies of the company (i.e. ROA and ROE). The presence of an industry-specialist audit firm has a positive and significant influence on two proxies of company performance (ROE and EPS), but a negative and significant impact on ROA. The tenure of an audit firm has a negative and significant influence on two performance proxies (ROA and EPS), but a positive and significant impact on ROE. Then, EM practices either fully or partially mediate the link between audit quality proxies and company performance as measured by ROA, ROE and EPS. Finally, such findings enable decision makers, such as shareholders, investors, policymakers or other interested parties, to assess the company's environment and assist them in making critical relevant decisions.

The rest of this paper is structured as follows. Section 2 includes the literature review and hypotheses development. The methodology is given in Section 3. Section 4 presents data analysis and findings and Section 5 contains the conclusion and the empirical implications.

2. Literature review and hypotheses development

2.1 Underlying theories

The agency theory aims to comprehend the issues that arise when the agent acts on behalf of another (principal) in the company (Mitnick, 2015). Agency theory implies opportunistic conduct, which means that individuals aim to increase their own expected interests, and, thus, managers and stakeholders will have conflicts of interest (McCullers and Schroeder, 1982). As a result, agency theory proposes control techniques to eliminate these conflicts, such as monitoring managers' performance by applying governance and engaging external audit (Brickley and James, 1987). It also strives to match the goals of management with those of stakeholders. In other words, the majority of decisions in companies are made by managers whose motivations are not always completely aligned with those of outside investors, which means that manager–shareholder disputes are caused by unobservable



managerial motivations and behaviors (Chen *et al.*, 2020). In this situation, agency theory supports the use of control techniques to reduce the EM practices, and improve the company performance (Jensen and Meckling, 1976).

According to the information asymmetry theory, the state of information asymmetry occurs when one party in a relationship has more or better information than the other (Bergh *et al.*, 2019). An information asymmetry in a company emerges as a consequence of managers having a competitive advantage in the company's information over the stakeholders (Zogning, 2017). Managers at a company typically have greater access to insider information about the company's operations than stakeholders, which allows them to manipulate earnings (Martinez-Sola *et al.*, 2018). Furthermore, Myers and Majluf (1984) contend that the presence of information asymmetries may raise the cost of external borrowing, which would have a negative influence on company performance. As a result, information asymmetry theory promotes the use of control strategies to reduce EM activities and improve company performance in this context.

Finally, according to agency theory and information asymmetry theory, manipulating discretionary accruals may aggravate both agency conflicts and information asymmetry among managers and stakeholders. Thus, the model of this study is based on both theories to investigate the link between audit quality, EM and company performance.

2.2 Audit quality and earnings management

The external audit quality is an important indicator to the trustworthiness of the company's financial reports, because audit quality is supposed to limit opportunistic EM and highlight the risk, major misstatements or exclusions in financial reports (Chen *et al.*, 2020; Jensen and Meckling, 1976). The external auditor's responsibility is to identify these and offer an independent opinion on these reports. Auditor independence is linked with auditor impartiality and the ability to withstand client pressure to approve poor-quality reports (Almasarwah, 2019). The lack of an independent auditor will cause financial reporting to be doubted by users.

The majority of audit quality research has concentrated on the distinctions between big-firm auditors and non-big-firm auditors. Big-firm auditors would be more motivated to expose managerial deceit as they may be able to exert much more effective oversight over companies, and they would lose out if an audit debacle occurred (Chen *et al.*, 2011; Rusmin, 2010). Furthermore, because they have more customers to take care of, big-firm auditors have strong incentives to develop and maintain a high-quality audit scope, increasing the possibility of devoting vital resources to auditing to protect their clients' reputation (Wijaya, 2020). As a result, they will be more effective in reducing EM to protect their reputations and avoid legal risk (Lin and Hwang, 2010).

On the other hand, other investigations (such as Dimitropoulos *et al.*, 2012; Lin and Hwang, 2010) discovered a positive relationship between big-firm auditors and EM practices. They observed that big-firm auditors are paid more than other auditors, and that audit fees had a positive relationship with EM. This result is also supported by Alali (2011) and Li and Lin (2007). They may be more interested in satisfying managers than others because of the higher fees they get, which has a negative influence on their role in limiting EM practices (Abbott *et al.*, 2006). On other side, other researches (such as Majjoor and Vanstraelen, 2006; Sun *et al.*, 2011) discovered no significant association between big-firm auditors and EM practices.

Earlier audit quality studies (Sharf and Abu-Nassar, 2021; Sumiadji and Subiyantoro, 2009) concluded that the industry-specialist audit firm component is an important proxy for external audit quality. Audit firms that specialize in the client's industry have a higher level

Audit quality
and company
performance

JFRA

of consistency than others; this is because they have more expertise and understanding in the client's environment and industry as a result of previous audit work on rival clients in the same industry (Al-Thuneibat *et al.*, 2011; Johnson *et al.*, 2002).

Furthermore, audit firm turnover is a significant predictor of external audit quality (Alsufy *et al.*, 2020; Bauwhede *et al.*, 2003). The high audit firm turnover contributes to increase audit independence and user confidence in previous audit reports, ultimately improving audit quality (Wijaya, 2020). Therefore, we can note that industry-specialist audit firm and audit firm turnover can both improve and restrict accounting information quality and EM practices, respectively (Alsufy *et al.*, 2020; Sumiadji and Subiyantoro, 2009).

Finally, the high quality of auditing contributes to increase the authenticity of the financial information provided, which leads to a rise in the level of trust placed in these companies by stakeholders, investors and other interested parties (Ugwunta *et al.*, 2018; Wijaya, 2020). Several prior studies, such as Habbash (2010), revealed a significant inverse relationship between audit quality and EM. As a result, several company-related decision makers have shown an interest in auditing quality to assure company efficiency and reduce EM behaviors (Alsmairat *et al.*, 2018; Inaam and Khamoussi, 2016).

Based on the above discussions, which afforded several arguments concerning the linkage of audit quality with EM practices, the first purpose of this study is to give further explanations in this context. Hence, the first hypothesis of this study is as follows.

H1. Audit quality negatively affects the EM practices.

2.3 Audit quality and company performance

Agency theory was used in the majority of previous studies that looked at the relationship between audit quality and company financial performance and several of these studies have revealed that audit quality improves a company's financial performance (Sayyar *et al.*, 2015). According to Saidat *et al.* (2019) and Alqirem *et al.* (2020), the fundamental role of the control process in companies is to increase the efficiency and effectiveness of operational performance, to preserve the company's reputation and to decrease agency conflicts between management and stakeholders. Jusoh *et al.* (2013) and Farouk and Hassan (2014) documented that there is a negative relationship between audit quality and agency costs, because external auditors give an indicator of the legitimacy and integrity of financial reports, which may lead to an improvement in company performance.

According to Afza and Nazir (2014) and Phan *et al.* (2020), the quality of external audit improves a company's performance because of investor perception. They also believe that companies that are audited by big-audit firms would provide reliable, proper and genuine financial reports, hence increasing overall investor trust in these companies. On the other hand, Alali (2011), Lin and Hwang (2010) and Ugwu *et al.* (2020) discovered a negative association between big-audit firm fees and company financial performance, indicating that the greater the audit fees, the lower the company financial performance. In addition, Azizkhani *et al.* (2018) observed that, in the field of the industry-specialist audit firm as a proxy for audit quality, the industry-specialist audit firm plays an essential role in boosting audit effectiveness and efficiency in discovering accounting information abnormalities. According to Wijaya (2020), there is a positive association between audit effectiveness and company performance.

Okolie (2014) consistently defined audit tenure as the length of an auditor's engagement with a client company. An auditor's long-term involvement with a client company may pose a risk to independence. This is because of the fact that personal bonds and familiarity may develop between the parties, potentially resulting in a lack of attention and awareness on the



part of the auditor (Ching *et al.*, 2015). Additionally, Chi and Huang (2005) showed that personal bonds and familiarity aid in the auditing process, but excessive personal bonds and familiarity decrease audit quality. According to Piot and Janin (2007), Ewelt-Knauer *et al.* (2013) and Sayyar *et al.* (2015), auditors may devote less effort to finding internal control shortcomings and related risks when audit engagements become more routine. This might have a negative influence on the company's performance.

As a consequence, the second purpose of this study is to present more empirical evidence about the relationship between audit quality and company performance. The second hypothesis for this investigation is as follows.

H2. Audit quality positively affects the company performance.

2.4 Mediating effect of earnings management in the relationship between audit quality and company performance

EM is a practice used by a company's executives to influence the earnings reported in its financial statements by maximizing or minimizing returns to achieve specific side goals (Azzam *et al.*, 2021; Dempster and Oliver, 2019; Li, 2014). Subramanyam (1996) documented that EM is classified into two types, namely, effective and opportunistic. Effective EM entails managers using their discretion to maximize their usefulness, and, therefore, efficient EM brings value to the company, while the core premise of opportunistic EM is that struggling companies are willing to hide uncertainty owing to significant earnings overstatement (Abbas and Ayub, 2019). Hence, previous literature argued that there is a positive link between EM practices and company performance, because managers use EM to boost company profitability, improving their image in the eyes of shareholders and avoiding agency conflicts (Abbas and Ayub, 2019; Jiraporn *et al.*, 2008). On the other hand, other empirical studies have found that EM has a detrimental impact on company performance, because managers use EM through accruals to impair company performance to avoid paying taxes and fees (Machdar *et al.*, 2017; Martowidjojo *et al.*, 2019). Additionally, Thu *et al.* (2018) noted that debt cost was not significantly affected by accrual-based EM.

Finally, we can highlight that there is different empirical evidence about the relationship between EM practices and company performance; hence, the third purpose of this study is to present further empirical evidence in this context. The third hypothesis is as follows.

H3. There is relationship between EM practices and company performance.

Prior literature mentioned that the EM practices are negatively affected by the control mechanism (Idris *et al.*, 2018; Lee, 2019). Such a mechanism provides a chance for management to work as an agent and to discourage aberrant behavior. At the same time, Mahrani and Soewarno (2018) noted that the financial performance is improved by the control mechanism, because this works on improving the operational activities in the companies, and, thus, the financial performance will be improved. Additionally, Ching *et al.* (2015) and Alqirem *et al.* (2020) confirmed that EM practices mediate the relationship between the control mechanism and financial performance: the control mechanism will improve the company's financial performance by reducing risks and opportunistic behaviors.

Furthermore, the study's end purpose is to offer further evidence on the role of EM practices as a mediator in the relationship between audit quality and company performance. Thus, the fourth hypothesis of this study may be phrased as follows.

Audit quality
and company
performance

H4. EM practices mediate the relationship between audit quality and company performance.

3. Methodology

The following subsections show the production and sampling method and measurement of variables.

3.1 Population and sampling method

The current study chose the period from 2012 to 2019 because it has comparable traits in the Jordanian environment, because this era was defined by stability in comparison to the preceding or following periods. For example, the preceding periods were impacted by several crises, such as the global crisis in 2008 and the Arab Spring crisis that began in 2010. The COVID-19 pandemic also had an impact on the periods that followed. As a result, these crises may have an impact on the performance of the companies, and, therefore, the current study's results may be biased owing to dependence on unstable data, necessitating the use of data from more stable periods.

Looking at Jordan from 2012 to 2019, the service sector accounts for roughly two-thirds of productivity when compared to other sectors, and, thus, the role of service companies in the Jordanian environment is important because of their contribution to GDP, which is why Jordan's market was dubbed the service market. Therefore, the current study targeted the Jordanian companies listed in the service sector, where the population of this study is represented in all service companies listed on the Amman Stock Exchange (ASE), a total of 47 companies. Moreover, financial and other nonfinancial companies are excluded from the study population because each sector listed on the Jordanian market has unique regulatory criteria that differ from those of other sectors. Finally, for the time period (2012–2019), a sample of 43 service companies was gathered, yielding a total of 344 company-year observations, and four service companies were excluded from the population owing to a lack of complete data across the period. Furthermore, this study used panel data analysis, and the data for the study were gathered from yearly reports as well as the ASE's database.

3.2 Measurement of variables

According to previous literature, the audit quality is measured by three main proxies, namely, size of audit firm (whether or not the company is audited by a big-firm auditor), industry specialization of audit firms (whether or not the company is audited by industry-specialist audit firm) and an audit tenure (the length of the audit firm–client relationship) (Abu Afifa *et al.*, 2020; Al-Thuneibat *et al.*, 2011; Sumiadiji and Subiyantoro, 2009). Hence, this study also used these main proxies to measure the audit quality, where audit quality is included in the study model as an independent variable. Additionally, prior literature (Alqirem *et al.*, 2020; Sayyar *et al.*, 2015) documented that there are also three proxies to represent the company's performance from the financial side, where the company's performance is included in the study model as a dependent variable, namely, ROA, ROE and EPS. These proxies are considered as profitability indicators; hence, this study used these indicators to measure the company's performance.

EM was included in the study model as a mediator variable, and accruals-based EM using the modified Jones model has been widely used in prior investigations (such as Alqirem *et al.*, 2020; Chang and Sun, 2009; Saleh *et al.*, 2020a). The modified Jones model is used to determine EM by measuring non-discretionary accruals (Dechow *et al.*, 1995; Jones, 1991), and prior literature mentioned that the modified Jones model is more suited to

measuring EM than others (Chen, 2010). Therefore, this study used the modified Jones model to measure EM.

Next, this study takes into account a number of controls variables, namely, company's size, company value (CV), cash holdings (CH), leverage (Lev) and dividends payout. Prior research (Dechow and Dichev, 2002) accounted for the characteristics of larger companies, which comprise more predictable and diverse operations, and, therefore, earnings should be of higher quality and truly given to the stakeholders of those companies. An examination of previous research (Dechow and Dichev, 2002; Mao and Renneboog, 2015) suggests that managers of such companies have a significant capacity to manipulate earnings because of the large number of transactions they perform. Furthermore, other researches (Goh *et al.*, 2013; Liu and Tsai, 2015) documented that the company's size, CV, CH, Lev and dividends payout may affect the company performance, as well as may induce managers to manipulate earnings. Considering that when there have been losses in the past, there is a larger likelihood that more EM is done to meet the investors' expectations of generating a profit.

Finally, Table 1 shows how each variable in the study model was calculated.

4. Data analysis and findings

The following subsections present the results of the data analysis using descriptive analysis, data validity and regression analysis models.

4.1 Descriptive analysis

Measures of mean, standard deviation and max–min values were used to show the descriptive analysis for the study variables during the period. The results in Table 2 show the mean size of audit firm (SofAF; 0.445), which means that 44.5% of targeted companies were audited by a big-firm auditor, as well as 55.5% of those companies were audited by other audit firms. The mean Industry-specialist audit firm (ISAF; 0.814) indicates that around 81.4% of them were audited by an industry-specialist audit firm. The mean audit firm tenure (AFT; 0.791) also means that around 79.1% of those companies were audited by the same audit firm for three consecutive years or more. The scales of audit quality proxies are largely compatible with similar studies in Jordan, such as Al-Thuneibat *et al.* (2011), Alsmairat *et al.* (2018), Abu Afifa *et al.* (2020) and Almarayeh *et al.* (2020). In addition, the mean EM (–0.031) means that the targeted companies have been involved to some extent in EM practices by reducing their earnings to fulfill some secondary objectives, such as evading taxation. A possible explanation for this result is that the governance practices in Jordanian companies and other MENA companies are at the low level, which positively affects the EM practices (Almarayeh *et al.*, 2020; Latif *et al.*, 2017; Shbeilat and Abdel-Qader, 2018; Toumeh *et al.*, 2021). Additionally, some opportunistic practices comply with international accounting standards as well as generally accepted accounting principles, which may support the possibility of major auditing firms providing advice on those practices that achieve administrative goals and are in accordance with accounting legislation.

The results in Table 2 also show the mean ROA (0.115%), the mean ROE (0.228%) and the mean EPS (0.111) with standard deviation of 3.293, 5.921 and 0.315, respectively. It also presents the mean size (17.461), the mean CV (17.428), the mean CH (7.267%), the mean Lev (34.747%) and the mean dividends (44.069%) with standard deviations of 1.547, 1.675, 12.109, 25.615 and 56.913, respectively. The significant results of these indicators indicate that the targeted companies retained 7.267% of their total assets as cash and cash

Table 1.
Equations of the study variables

Variable	Code	Measurement equation	Reference
Size of audit firm	SoAF	Is measured as a dummy variable equal to one if company <i>i</i> in year <i>t</i> audited by a big-firm auditor, otherwise zero	Abu Afifa <i>et al.</i> (2020), Al-Thuneibat <i>et al.</i> (2011), Sumiadi and Subiyantoro (2009), Johnson <i>et al.</i> (2002)
Industry-specialist audit firm	ISAF	Is measured as a dummy variable equal to one if company <i>i</i> in year <i>t</i> audited by industry-specialist audit firm (which has a market share in the client sector equal to or greater than 5%), otherwise zero	
Audit firm tenure	AFT	Is measured as a dummy variable equal to one if company <i>i</i> in year <i>t</i> audited by the same audit firm for three consecutive years or more, otherwise zero	
Return on assets	ROA	$\frac{\text{Net Income}_{i,t}}{\text{Total Assets}_{i,t}}$	Sayyar <i>et al.</i> (2015), Alqirem <i>et al.</i> (2020)
Return on equity	ROE	$\frac{\text{Net Income}_{i,t}}{\text{Total Equity}_{i,t}}$	
Earnings per share	EPS	$\frac{\text{Net Income}_{i,t}}{\text{Total Number of Ordinary Shares Outstanding}_{i,t}}$	
Earnings management	EM*	$TA_{i,t} = a_1 \left(\frac{1}{A_{i,t-1}} \right) + a_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right) + a_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{i,t}$ $DA_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - a_1 \left[\left(\frac{1}{A_{i,t-1}} \right) + a_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right) + a_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) \right]$	Jones (1991), Dechow <i>et al.</i> (1995)
Company size	Size	the natural logarithm (Ln) of total assets <i>i,t</i>	Zuhroh (2019)
Company value	CV**	$Ln(CV_{i,t}) = MCI_t + Total\ Debt_{i,t} - C_{i,t}$	Alfia <i>et al.</i> (2021)
Cash holdings	CH	$\frac{\text{Total Cash and Cash Equivalents}_{i,t}}{\text{Total Assets}_{i,t}}$	Caprio <i>et al.</i> (2020), Afifa <i>et al.</i> (2021)
Leverage	Lev	$\frac{\text{Total Debt}_{i,t}}{\text{Total Assets}_{i,t}}$	Ghasemi <i>et al.</i> (2018), Zuhroh (2019)
Dividends payout	Dividends	$\frac{\text{Dividend per Share}_{i,t}}{\text{EPS}_{i,t}}$	Geetha and Swaminathan (2015), Ghasemi <i>et al.</i> (2018)

Notes: *i* is the company; *t* is the year; *TA is the total accruals; AREV is the change in the revenues; AREC is the change in net account receivables; PPE is gross property, plant and equipment; A is the total assets; The non-discretionary accruals are measured as estimated residuals (ε) from the equation. DA is discretionary accruals. **Ln(CV) is the natural logarithm of company value; MC is market capitalization and it equals by the share price at the end of the period multiplied by total outstanding shares; Total Debt is the sum of short-term and long-term debt; C is total cash and cash equivalents

equivalents to meet a range of goals, and the majority of those companies used internal funding rather than external to finance their investments over the timeframe.

4.2 Data validity and reliability

The Pearson correlation test and the variance inflation factor (VIF) test were used to evaluate the validity and reliability of the study data. Prior literature established that a multicollinearity problem occurs when the correlations (Beta) between independent variables exceed 80%, as well as VIF and tolerance values are more than 5 and less than 20%, respectively (Gujarati, 2004). Table 3 shows that the correlations (Beta) between all variables are less than 80% – range 0.544–0.001. The strongest correlation exists between Size and Lev, whereas the weakest exists between AFT and EM. Also, the VIF and Tolerance values for all variables are more than 5 (range 1.984–1.087) and less than 20% (range 0.920–0.504), respectively. These results confirm that there is no multicollinearity problem in the study model.

Time-series analysis is a statistical approach for analyzing the behavior of events and interpreting it over long periods of time. As a result, time-series stability is a critical issue in many applications that rely on cross-sectional time data, and, thus, the unit root test is one of the procedures used to guarantee data stability. The presence of the unit root in the data indicates that there are unpredictably random systematic patterns in the data, and it is said to be a stable series if the time-series does not include the unit root. In this study, the unit root test by augmented Dickey–Fuller was used. The results in Table 4 report that all variables in the time series are stable (stationary), because p -values were less than 5%. In the other words, we reject the hypothesis of the presence of a unit root in the data.

4.3 Regression analysis models

Time-series and cross-sectional time data are used to depict the data in this study. At the same time, there are two types of regression models: fixed effect models and random effect models. To choose which one of the regression models is appropriate in this study, the Hausman test was applied, and a fixed-effect model was used if the p -value was $\leq 5\%$, otherwise a random effect model was used. Hence, the results in Table 5 show that p -value for the first model ($H1$) is less than 5%, while the p -values for the remaining models ($H2, H3, H4$) are more than 5%, which means that a fixed-effect model can be adopted for the first model and a random effect model can be used for the remaining models. Therefore, the estimation equations produce standard regression models as follows:

Variable	No. of observations	Mean	SD	Maximum	Minimum
SofAF	344	0.445	0.498	1	0
ISAF	344	0.814	0.390	1	0
AFT	344	0.791	0.407	1	0
ROA 100%	344	0.115	3.293	29.289	–26.558
ROE 100%	344	0.228	5.921	33.510	–61.91
EPS	344	0.111	0.315	2.347	–0.764
EM	344	–0.031	0.097	0.879	–0.403
Size	344	17.461	1.547	21.31	13.029
CV	344	17.428	1.675	21.372	12.150
CH 100%	344	7.267	12.109	62.264	0.001
Lev 100%	344	34.747	25.615	104.24	0.100
Dividends 100%	344	44.069	56.913	413.53	0.000

Table 2.
Descriptive analysis

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Table 3.
Correlation matrix
and variance
inflation factor

Variable	SofAF	ISAF	AFT	EM	SIZE	CV	CH	Lev	Dividends	VIF	Tolerance
SofAF	1.000									1.699	0.588
ISAF	0.428**	1.000								1.487	0.673
AFT	0.087	0.158**	1.000							1.087	0.920
EM	-0.065	-0.104	-0.001	1.000						1.172	0.854
SIZE	-0.254**	-0.058	0.098	0.018	1.000					1.806	0.554
CV	0.506**	0.414**	0.085	-0.091	0.056	1.000				1.581	0.633
CH	-0.270**	-0.132*	0.137*	0.012	0.005	-0.241**	1.000			1.358	0.737
Lev	-0.118*	-0.280**	0.032	0.070	0.544**	-0.090	-0.271**	1.000		1.984	0.504
Dividends	-0.113*	0.103	0.044	0.030	0.253**	0.040	0.125*	-0.103	1.000	1.207	0.829

Notes: * $p < 0.05$; ** $p < 0.01$

Variable	<i>p</i> -value	Status	Audit quality and company performance
SofAF	0.000	Stationary*	
ISAF	0.020	Stationary*	
AFT	0.002	Stationary*	
ROA	0.000	Stationary*	
ROE	0.043	Stationary*	
EPS	0.000	Stationary*	
EM	0.000	Stationary*	
Size	0.000	Stationary*	
CV	0.000	Stationary*	
CH	0.000	Stationary*	
Lev	0.000	Stationary*	
Dividends	0.000	Stationary*	

Note: **p* < 0.05

Table 4.
Unit root test by augmented Dickey–Fuller

	Correlated random effects – Hausman test									
	Test cross-sectional random effects									
	<i>H1</i> model	<i>H2</i> model			<i>H3</i> model			<i>H4</i> model		
	ROA	ROE	EPS	ROA	ROE	EPS	ROA	ROE	EPS	
Chi-sq. statistic	21.079	12.638	9.14	8.381	8.691	5.363	8.979	14.78	10.8	10.53
Chi-sq. d.f.	8	8	8	8	6	6	6	9	9	9
Prob.	0.001	0.1249	0.331	0.397	0.191	0.498	0.175	0.097	0.290	0.309

Table 5.
Hausman test

$$EM_{i,t} = \alpha + \beta_1 SofAF_{i,t} + \beta_2 ISAF_{i,t} + \beta_3 AFT_{i,t} + \beta_4 Size_{i,t} + \beta_5 CV_{i,t} + \beta_6 CH_{i,t} + \beta_7 Lev_{i,t} + \beta_8 Dividends_{i,t} + (\varepsilon_i + v_{i,t}) \quad (1)$$

$$Performance_{i,t} = \alpha + \beta_1 SofAF_{i,t} + \beta_2 ISAF_{i,t} + \beta_3 AFT_{i,t} + \beta_4 Size_{i,t} + \beta_5 CV_{i,t} + \beta_6 CH_{i,t} + \beta_7 Lev_{i,t} + \beta_8 Dividends_{i,t} + (\varepsilon_i + v_{i,t}) \quad (2)$$

$$Performance_{i,t} = \alpha + \beta_1 EM_{i,t} + \beta_2 Size_{i,t} + \beta_3 CV_{i,t} + \beta_4 CH_{i,t} + \beta_5 Lev_{i,t} + \beta_6 Dividends_{i,t} + (\varepsilon_i + v_{i,t}) \quad (3)$$

$$Performance_{i,t} = \alpha + \beta_1 SofAF_{i,t} + \beta_2 ISAF_{i,t} + \beta_3 AFT_{i,t} + \beta_4 EM_{i,t} + \beta_5 Size_{i,t} + \beta_6 CV_{i,t} + \beta_7 CH_{i,t} + \beta_8 Lev_{i,t} + \beta_9 Dividends_{i,t} + (\varepsilon_i + v_{i,t}) \quad (4)$$

whereby *performance_{i,t}* is the performance proxies (i.e. ROA, ROE and EPS) for company *i* in the period *t*.

Additionally, to solve any autocorrelation issue in the residuals from regression analysis, the general final models adopt the following dynamic (autoregressive) forms:

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$$EM_{i,t} = \gamma_{1,i,t-1} + \beta_1 SofAF_{i,t} + \beta_2 ISAF_{i,t} + \beta_3 AFT_{i,t} + \beta_4 Size_{i,t} + \beta_5 CV_{i,t} + \beta_6 CH_{i,t} + \beta_7 Lev_{i,t} + \beta_8 Dividends_{i,t} + (\varepsilon_i + v_{i,t}) \quad (5)$$

$$Performance_{i,t} = \gamma_{1,i,t-1} + \beta_1 SofAF_{i,t} + \beta_2 ISAF_{i,t} + \beta_3 AFT_{i,t} + \beta_4 Size_{i,t} + \beta_5 CV_{i,t} + \beta_6 CH_{i,t} + \beta_7 Lev_{i,t} + \beta_8 Dividends_{i,t} + (\varepsilon_i + v_{i,t}) \quad (6)$$

$$Performance_{i,t} = \gamma_{1,i,t-1} + \beta_1 EM_{i,t} + \beta_2 Size_{i,t} + \beta_3 CV_{i,t} + \beta_4 CH_{i,t} + \beta_5 Lev_{i,t} + \beta_6 Dividends_{i,t} + (\varepsilon_i + v_{i,t}) \quad (7)$$

$$Performance_{i,t} = \gamma_{1,i,t-1} + \beta_1 SofAF_{i,t} + \beta_2 ISAF_{i,t} + \beta_3 AFT_{i,t} + \beta_4 EM_{i,t} + \beta_5 Size_{i,t} + \beta_6 CV_{i,t} + \beta_7 CH_{i,t} + \beta_8 Lev_{i,t} + \beta_9 Dividends_{i,t} + (\varepsilon_i + v_{i,t}) \quad (8)$$

whereby $\gamma_{1,i,t-1}$ denotes the lagged dependent variable.

Arellano and Bond (1991) and Blundell and Bond (1998) developed the GMM model, which may be used for dynamic panel data. The lags of the dependent variables are used as explanatory factors in dynamic panel data estimation models to manage endogenous relationship (Roodman, 2009). Furthermore, modeling the link between the variables in this study will be difficult if endogeneity is not appropriately addressed (Jmai, 2017). Therefore, the GMM model was used to estimate the findings in this study for numerous reasons. First, the model is a common estimator that provides a helpful foundation for comparison and evaluation. Second, it enables researchers to undertake more detailed estimation in the long term as well as the short term, and to overcome assumptions violations in regression analysis.

The GMM estimator results of the first analysis model that aims to investigate the effect of audit quality on EM are shown in Table 6. The results report that the previous year's EM and ISAF have a negative and insignificant impact on EM, whereas SofAF has a positive and significant impact, and AFT has a negative and significant impact. Therefore, *H1* is partially accepted. The results demonstrate that the higher the SofAF, the lower the EM practices, which means that the big-audit firms work more on decreasing opportunistic behaviors in the client's company. A possible explanation for this result is that large-firm auditors would be more driven to reveal management deception because they may be able to impose far more effective control over companies, and they would suffer if an audit fiasco happened (Chen et al., 2011; Rusmin, 2010). In other words, to protect their reputations and avoid legal risk, they will be more effective in reducing EM practices (Lin and Hwang, 2010; Wijaya, 2020).

Additionally, the result demonstrates that the higher the AFT, the lower the EM practices. This is supported by the agency theory and is consistent with prior studies, such as Bauwhede et al. (2003), Sumiadji and Subiyantoro (2009), Alsufy et al. (2020) and Wijaya (2020). A possible explanation for this result is that the high audit firm turnover serves to promote audit independence, resulting in increased control levels and decreased EM practices in the client's company.

The current conclusion about the influence of ISAF on EM practices is, to some extent, consistent with previous studies, which have provided evidence that ISAF has a negative

Variable	Fixed effect model		GMM model	
	Coeff.	<i>p</i> -value	Coeff.	<i>p</i> -value
C	-0.942	0.047**		
EM _{<i>t-1</i>}			-0.012	0.737
SofAF	0.022	0.336	0.221	0.015**
ISAF	0.048	0.031**	-0.058	0.591
AFT	-0.007	0.568	-0.108	0.001***
Size	0.041	0.059*	0.084	0.166
CV	0.011	0.031**	-0.041	0.154
CH	-0.001	0.613	-0.003	0.186
Lev	-0.001	0.029**	-0.007	0.000***
Dividends	-0.001	0.007***	-0.001	0.384
<i>R</i> -squared		0.251		
Adjusted <i>R</i> -squared		0.104		
<i>F</i> -statistic		1.707		
<i>p</i> -Value (<i>F</i> -statistic)		0.001***		
Durbin-Watson stat		2.118		
Sargan test			26.357	
Prob Sargan test			0.154	
Total panel observations		344	258	

Audit quality and company performance

Table 6.
Results of the first regression model (H1)

Note: Significance at the ***0.01, **0.05 and *0.10 level

impact on EM practices (Balsam *et al.*, 2003; Sun and Liu, 2013). Lee (2019) also stated that ISAF helps to enhance the monitoring system for client activities, which may have an impact on limiting EM practices, while other previous studies have shown little evidence that discretionary accruals of companies audited by industry specialized auditors are more relevant in value (Hegazy *et al.*, 2015; Jenkins *et al.*, 2006; Mascarenhas *et al.*, 2010). Jenkins *et al.* (2006) documented that the productivity of industry specialized auditors is restricted and is not associated with earnings quality while Mascarenhas *et al.* (2010) found no evidence to support the idea that specialist auditors are superior at identifying and controlling opportunistic discretionary accruals.

Following that, Lev has a negative and significant influence on EM practices in companies, meaning that managers of companies with a high leverage ratio have a lower capacity to manipulate earnings because of the possibility of stringent oversight by creditors (Dechow and Dichev, 2002; Mao and Renneboog, 2015; Saleh *et al.*, 2020a).

Table 7 displays the results of the second hypothesis, which seeks to investigate the effect of audit quality on company performance. According to the GMM estimator results, SofAF has a positive and significant effect on the company's performance proxies (i.e. ROA and ROE). Furthermore, ISAF has a positive and significant effect on two proxies of the company's performance (i.e. ROE and EPS), while it has a negative and significant effect on ROA. AFT has a negative and significant effect on two proxies of the company's performance (i.e. ROA and EPS), while it has a positive and significant effect on ROE. Following that, Size has a positive and significant effect on ROA and ROE, and has a negative and significant effect on EPS. CV also has a negative and significant effect on the company's performance proxies (i.e. ROA, ROE and EPS). CH, Lev and Dividends have a negative and significant effect on ROE. Finally, H2 is partially accepted.

Recent research (Alali, 2011; Lin and Hwang, 2010; Ugwu *et al.*, 2020) has shown that large audit firms get a greater audit fee than smaller audit firms, and there is a negative

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Table 7.
 Results of the second
 regression model
 (H2)

Variable	ROA model		Random effect model		EPS model		ROA model		GMM model		EPS model	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
C	-61.873	0.000***	-85.312	0.000***	-0.926	0.003***	-0.151	0.000***	0.083	0.000***	0.125	0.000***
ROA _{t-1}												
ROE _{t-1}												
EPS _{t-1}												
SofAF	-4.166	0.010**	-4.225	0.070*	-0.057	0.069*	0.706	0.007***	7.754	0.004***	-0.131	0.214
ISAF	0.968	0.570	0.346	0.890	-0.001	0.965	-0.572	0.000***	1.436	0.000***	0.745	0.000***
AFT	1.106	0.280	3.311	0.040**	0.008	0.673	-0.735	0.000***	5.041	0.000***	-0.272	0.000***
Size	0.562	0.480	0.952	0.350	-0.001	0.932	0.971	0.015**	11.751	0.000***	-0.352	0.000***
CV	2.997	0.000***	4.066	0.000***	0.058	0.000***	-0.445	0.000***	-7.419	0.000***	-0.308	0.000***
CH	0.205	0.000***	0.136	0.080*	0.002	0.079*	0.004	0.759	-0.301	0.004***	0.001	0.788
Lev	0.012	0.730	-0.004	0.930	-6.001	0.921	-0.026	0.000***	-0.064	0.000***	0.002	0.502
Dividends	0.004	0.710	-0.001	0.930	0.001	0.285	-0.001	0.622	-0.032	0.000***	-3.781	0.845
R-squared	0.135		0.116		0.097							
Adjusted R-squared	0.113		0.092		0.074							
F-statistic	6.143		4.933		4.252							
p-Value (F-statistic)	0.000***		0.000***		0.001***							
Sargan test												
Prob Sargan test												
Total panel observations	344		344		344		19.385		19.168		18.436	
							0.496		0.511		0.558	
							258		258		258	

Note: Significance at the ***0.01, **0.05 and *0.10 level

relationship between big-audit firm fees and company performance, implying that the greater the audit fees, the lower the company's financial performance. These findings are not consistent with our findings on SofAF's effect, but are consistent with the findings of Afza and Nazir (2014) and Phan *et al.* (2020), who found a positive link between companies audited by big-audit firms and their performance. One possible reason for this result is that large audit firms are more concerned with the preservation of the company's resources than smaller firms, to mitigate the risks connected with the use of the company's resources, and, thus, the company's performance will increase. In addition, our findings on the influence of ISAF on company performance do not agree with those of Jenkins *et al.* (2006) and Mascarenhas *et al.* (2010), who believe that industry specialist auditors have no discernible impact on company performance, while they are consistent with the findings of Balsam *et al.* (2003), Sun and Liu (2013) and Lee (2019), who found that industry-specialist auditors influence company performance through their role as a monitoring system for client activity.

Furthermore, the results, to some extent, match with the findings of Elewa and El-Haddad (2019) that a high AFT contributes to improving accounting information quality and reducing agency conflicts between managers and shareholders, while a new audit firm has less information about the client's environment, necessitating more effort and time, increasing the possibility of paying higher audit fees, and, thus, reducing the amount of returns achieved during the period.

The results of the third GMM analysis model (*H3*), as shown in Table 8, reveal that EM has a negative and significant influence on the company's performance proxied by ROA and ROE. That is, the higher the EM practices, the lower the company's performance (i.e. ROA and ROE). These findings reinforce the notion that effective EM necessitates managers exercising judgment to minimize the company performance, and, therefore, efficient EM gives value to companies by reducing the amount of taxes and fees during the period (Subramanyam, 1996). The findings are consistent with prior studies (Machdar *et al.*, 2017; Martowidjojo *et al.*, 2019), which revealed that accrual-based EM had a negative impact on company performance. They documented that managers use EM via accruals to stifle company performance to avoid paying taxes and fees. Furthermore, these findings contradict previous research findings (Abbas and Ayub, 2019; Almasarwah *et al.*, 2021; Jiraporn *et al.*, 2008), which found that EM practices have a positive impact on company performance, where managers use EM practices to increase company profitability to improve their image in the eyes of shareholders and avoid agency conflicts. Thus, *H3* is fully accepted.

The fourth GMM analysis model was used to look at the indirect (mediation) effect of EM practices in the relationship between audit quality and company performance. Table 9 shows that EM practices fully mediate the relationship between SofAF and AFT, and company performance proxies (i.e. ROA and ROE). Additionally, EM practices fully mediate the relationship between AFT and EPS, while EM practices partially mediate the relationship between SofAF and EPS, as well as ISAF and the performance proxies (i.e. ROA, ROE and EPS). These results are supported by prior literature (Ching *et al.*, 2015; Mahrani and Soewarno, 2018), which noted that EM mediates the control mechanism, which impacts financial performance. Abu Afifa *et al.* (2020) also noted that, to some extent, earnings quality mediates the relationship between audit quality and share price. Therefore, *H4* is accepted.

4.4 Robustness checks

For robustness checks, there is a need to use other measures of discretionary accruals such as the performance-matched discretionary accruals of Kothari *et al.* (2005) who conducted a

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Table 8.
Results of the third
regression model
(H3)

Variable	ROA Model		Random effect model		EPS Model		ROA Model		GMM model		EPS Model	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
C	-57.584	0.000***	-89.244	0.000***	-0.884	0.003***	-0.037	0.000***	0.064	0.000***	0.208	0.000***
ROA _{t-1}											-0.114	0.154
ROE _{t-1}											0.005	0.054*
EPS _{t-1}											-0.484	0.000***
EM	16.825	0.003***	12.547	0.096*	0.186	0.066*	-8.746	0.000***	-8.746	0.000***	0.005	0.054*
Size	0.613	0.431	1.295	0.190	0.001	0.914	-0.018	0.000***	-0.199	0.000***	0.005	0.054*
CV	2.688	0.000***	3.977	0.000***	0.052	0.000***	1.536	0.000***	10.612	0.000***	-0.484	0.000***
CH	0.205	0.000***	0.163	0.037**	0.002	0.067*	-0.291	0.000***	-5.168	0.000***	-0.274	0.000***
Lev	0.025	0.491	0.005	0.915	9.091	0.891	-0.001	0.529	-0.023	0.001***	4.840	0.759
Dividends	0.012	0.331	0.009	0.644	0.001	0.242	0.008	0.203	-0.627	0.000***	0.003	0.205
R-squared	0.143		0.121		0.101							
Adjusted R-squared	0.125		0.103		0.082							
F-statistic	5.453		6.594		5.526							
p-Value (F-statistic)	0.000***		0.000***		0.000***							
Sargan test												
Prob Sargan test							20.651		26.008		23.104	
Total panel observations	344		344		344		0.417		0.165		0.285	
							258		258		258	

Note: Significance at the ***0.01, **0.05 and *0.10 level

Variable	ROA model		Random effect model		EPS model		ROA model		GMM model		EPS model	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
C	-57.263	0.000***	-80.810	0.001***	-0.871	0.003***	-0.142	0.000***	0.105	0.000***	0.121	0.000***
ROA _{t-1}												
ROE _{t-1}												
EPS _{t-1}												
SofAF	-4.108	0.018**	-3.989	0.098*	-0.055	0.083*	0.788	0.001***	8.015	0.000***	-0.197	0.0069*
ISAF	0.307	0.858	-0.046	0.985	-0.011	0.733	-0.461	0.000***	1.648	0.000***	0.791	0.000***
AFT	1.429	0.176	3.259	0.049**	0.019	0.318	-0.641	0.001***	5.165	0.000***	-0.227	0.000***
EM	17.125	0.024**	18.915	0.037**	0.196	0.053*	-0.934	0.000***	-7.503	0.000***	-0.243	0.072*
Size	0.263	0.744	0.668	0.508	-0.003	0.825	-0.024	0.000***	-0.096	0.000***	-0.001	0.921
CV	3.042	0.000***	4.123	0.000***	0.057	0.000***	1.123	0.001***	11.854	0.000***	-0.281	0.000***
CH	0.204	0.000***	0.118	0.127	0.001	0.091*	-0.501	0.000***	-7.257	0.000***	-0.321	0.000***
Lev	0.032	0.377	0.007	0.877	0.001	0.849	-0.001	0.462	-0.027	0.000***	-0.001	0.472
Dividends	0.009	0.498	0.004	0.832	0.002	0.247	0.008	0.381	-0.368	0.000***	0.002	0.621
R-squared	0.165		0.132		0.113							
Adjusted R-squared	0.139		0.104		0.086							
F-statistic	6.452		4.769		4.198							
p-Value (F-statistic)	0.000***		0.000***		0.000***							
Sargan test												
Prob Sargan test												
Total panel observations	344		344		344		20.013		23.633		21.905	
							0.457		0.258		0.345	
							258		258		258	

Note: Significance at the ***0.01, **0.05 and *0.10 level

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and company
performance

Table 9.
Results of the fourth
regression model
(H4)

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simulation to assess the power of the modified Jones model and discovered that using discretionary accruals performance measures increases conclusion dependability. Their measurement equation of performance-matched discretionary accruals is as follows:

$$\frac{TA_{i,t}}{A_{i,t-1}} = a_1 \left(\frac{1}{A_{i,t-1}} \right) + a_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right) + a_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + ROA_{i,t} + \varepsilon_{i,t} \quad (9)$$

$$DA_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - \left[a_1 \left(\frac{1}{A_{i,t-1}} \right) + a_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right) + a_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + ROA_{i,t} \right] \quad (10)$$

As a result, we pushed the *H1*, *H3* and *H4* models to the GMM test by measuring EM practices using the performance-matched discretionary accruals of [Kothari et al. \(2005\)](#). According to the findings in [Table 10](#), SofAF and AFT have a positive and negative influence on EM practices, respectively, but ISAF has a negative and insignificant effect. EM practices have a negative impact on two proxies of company performance (ROA and ROE), but have no influence on EPS. Furthermore, EM practices either fully or partially mediate the relationship between audit quality proxies and company performance as measured by ROA, ROE and EPS. The control variable results are also similar to those presented in the main analysis. Finally, we can see that the results of the performance matched the discretionary accruals of [Kothari et al. \(2005\)](#) closely reflecting the results of the main analysis models (*H1*, *H3* and *H4*).

5. Conclusion

The purpose of this study is to look into the relationship between audit quality, EM and company performance. More crucially, it investigates the mediating effect of EM practices in the relationship between audit quality and company performance, attempting to fill a gap in the previous literature. It presents empirical evidence from the Jordanian market as an emerging market, particularly from Jordanian service companies listed on ASE during the period from 2012 to 2019. The panel data analysis of 43 Jordanian service companies listed throughout the time period was used in this study.

Our findings show that, to some extent, Jordanian service companies have a low level of audit quality, which encourages managers to manipulate earnings. The average of these companies' EM practices was negative, indicating that managers tend to manipulate earnings by reducing rather than raising returns. Moreover, SofAF and AFT have a positive and negative influence on EM practices, respectively, but ISAF has a negative and insignificant effect. EM practices have a negative impact on two proxies of company performance (ROA and ROE), but have no influence on EPS.

Our findings also indicate that SofAF has a positive and significant impact on the company's performance proxies (i.e. ROA and ROE). Furthermore, ISAF has a positive and significant impact on two proxies of company performance (ROE and EPS), but a negative and significant effect on ROA. AFT has a negative and significant impact on two performance proxies (ROA and EPS), but a positive and significant effect on ROE. Following that, Size has a positive and significant impact on ROA and ROE, but a negative and significant effect on EPS. CV has a negative and significant impact on the company's

Variable	H1		H3		H4		EPS model		ROA model		ROE model		EPS model	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
ROA _{t-1}			-0.038	0.000***			-0.149	0.000***			0.102	0.000***		
ROE _{t-1}					0.061	0.000***							0.123	0.000***
EPS _{t-1}									0.206	0.000***				
EM _{t-1}	-0.022	0.561												
SoFAF	0.261	0.014**												
ISAF	-0.086	0.466												
AFT	-0.112	0.001***												
EM			-0.526	0.000***	-7.541	0.000***	-0.517	0.004***	-0.081	0.310	-5.512	0.000***	-0.181	0.082*
Size	0.072	0.242	1.447	0.000***	9.914	0.000***	1.058	0.008***	-0.498	0.000***	12.222	0.000***	-0.281	0.000***
CV	-0.044	0.121	-0.309	0.000***	-5.992	0.000***	-0.479	0.002***	-0.272	0.000***	-6.976	0.000***	-0.323	0.000***
CH	-0.002	0.299	0.021	0.001***	-0.610	0.000***	0.009	0.371	0.004	0.206	-0.344	0.001***	0.002	0.545
Lev	-0.007	0.000***	-0.016	0.000***	-0.146	0.000***	-0.025	0.000***	0.006	0.036**	-0.103	0.000***	-0.217	0.978
Dividends	-0.001	0.475	-0.001	0.336	-0.023	0.001***	-0.001	0.753	5.931	0.697	-0.029	0.000***	-0.001	0.509
Sargan test	25.216		17.475		22.583		20.543		22.898		21.854		21.566	
Prob Sargan test	0.193		0.491		0.309		0.424		0.293		0.348		0.364	

Note: Significance at the ***0.01, **0.05 and *0.10 level

Audit quality
and company
performance

Table 10.
Robustness checks
using the GMM
model

JFRA

performance proxies as well (i.e. ROA, ROE and EPS). Dividends, CH and Lev all have a negative and significant impact on ROE. Furthermore, EM practices either fully or partially mediate the relationship between audit quality proxies (SofAF, ISAF and AFT) and company performance as measured by ROA, ROE and EPS.

Finally, analysts, investors and other strategic decision makers may use the findings of this study to improve the efficiency and efficacy of Jordan's financial market. These findings will enhance policymakers' willingness to establish appropriate regulations, which might improve Jordan's financial market performance and efficacy. These findings may help investors make better judgments by using audit quality proxies and EM indicators that can forecast business success. However, the present study's limitation is that it only searched in Jordanian service companies listed on ASE from 2012–2019 to meet the study's aims; hence, we recommend that future work investigate the study models for other sectors, whether in Jordan or in other emerging markets such as MENA. Another limitation of this study is that the study models lack important variables, which may affect EM and company performance, such as corporate governance and ownership structure characteristics; as a result, we recommend that future work includes such variables in the research models to have more explanations in this context.

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