Journal of Ecohumanism
2024
Volume: 3, No: 5, pp. 1336 – 1351
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i5.3977

Assessing The Impact of Audit Quality on Earnings Management Strategies: A Comprehensive Study

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Abstract

The purpose of the current study is to examine whether audit quality is capable to restrict earnings management in a developing country such as Jordan. The fixed effect method was used to study the association between two audit quality (audit fees and audit firm size) and discretionary accruals (AEM) with real activities (REM) as a proxy of earnings management, for the industrial service firms listed on the Amman Stock Exchange (ASE) during the period 2012-2021. Using 740 firm-year observations, the results showed that the audit fees (AFEE) are significantly and positively related to earnings management measured by discretionary accruals (AEM), while the aggregated measure of real earnings management (REM) shows a significant negative association with the audit fees (AFEE). Meanwhile, the result showed that the existence of audit firm size (B4) is a negative and significant effect on earnings management measured by discretionary accruals (AEM) and the aggregated measure of real earnings management (REM). Thus, these findings provide shreds of evidence for all of the regulators, investors, and executives in Jordan into account when designing corporate regulations. Hence, due to the significant impact on public policies, the results should be of interest to the regulators and standard setters.

Keywords: *Audit Quality, Accrual Earnings Management, Real Earnings Management.*

Introduction

The recent scandals involving corporate accounting have sparked curiosity regarding the role of auditing in guaranteeing the accuracy of reported earnings and the reliability of financial statements (Lin & Hwang, 2010). Also, it has raised concerns about external audit quality and its capacity to restrict earnings management (Almarayeh et al., 2020). Furthermore, investors are now questioning the management systems of businesses that have been subject to collapse because they want to know whether the company's internal controls are effective and whether the auditors are to blame for the failure of the company (Geisler & Turchetti, 2018).

Numerous studies have looked at the connection between audit quality and earnings management over the last 20 years. However, most of those studies have emphasized that regional cultural, economic, institutional, and legal variations can impact the auditing function in limiting earnings management (Pacheco Paredes & Wheatley, 2017). The effectiveness of corporate governance mechanisms provided by firms to market participants and the level of investor protection are thus different in developing countries than they are in developed countries (Bao & Lewellyn, 2017), which encourages earnings management (Lai & Chen, 2014).

In this context, Almarayeh et al. (2020) pointed out that nations with less developed capital markets, limited investor protection, concentrated ownership, and lax legal enforcement are typically ones where earnings management is more common. As a result, the directors of the companies who accepted them may use this flexibility to pursue personal objectives, such as working to attain the specified level of profit to keep their job and receive higher compensation (Tangenes & Steen, 2017). While the amount of revenue for the accounting period that may have an impact on the interests of other linked parties reflects the achievement of this level of intended profits. This has, in turn, caused what is known as the phenomena of earnings management to evolve, claim (Saxunova & Szarkova, 2018). Thus, this paper aims to shed light on the extent to which audit quality is capable to restrict earnings management in a developing country, Jordan,

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whose cultural, economic, and institutional context is very different from most previously analyzed countries' context.

Empirical evidence on Jordan is limited. Shahwan (2021) found that Big Four audit firms are not significantly different in their ability to restrict earnings management practices. Similarly, Warrad and Nassar (2017) indicated an insignificant effect of audit firm size on earnings management. On the other hand, Alzoubi (2017) noted evidence that audit quality negatively affects earnings management. Meanwhile, Al-Omush et al. (2018) reported results revealed that the organizations that are audited by Big 4 companies, tend to manage lesser earnings than other companies audited by non-Big 4.

Thus, the current study aims to contribute to the literature on audit quality and earnings management through the understanding of the link between audit quality and earnings management, and how empirical evidence can offer pertinent insight into audit quality to limit earnings management in emerging markets. Also, the current study's findings could provide valuable information to regulators and policy setters, both in Jordan and other countries with a similar economic and institutional environment, to restrict earnings management. Consequently, to investigate the effect of audit quality on earnings management, two proxies for audit quality were considered: audit firm size (Big4) and audit fees. While earnings management examines through two proxies which are: accrual-based earnings management (based on the Kothari et al. model, 2005) and real earnings management (based on the Roychowdhury model, 2006). Data were collected for Jordanian industrial and service sectors listed on the Amman Stock Exchange (ASE) from 2012 to 2021.

Literature Review

Earnings Management

One of the biggest issues affecting a company's effectiveness is earnings management (Alyaarubi et al., 2021). Poor earnings management causes stakeholders or organization owners to lose their credibility, which has negative effects like a loss of confidence (Flayyih et al., 2018). Additionally, according to other studies, managers can manipulate their contractual agreements with owners or deceive stakeholders as part of the earnings management process (Kurniawan & Antonio, 2022). Therefore, there are two types of earnings management. One of these is accrual earnings management, which, according to Challen & Siregar (2012), involves the manipulation of targets through the choice of accounting policies and estimates to meet profit expectations, in addition to earnings management as a manipulation activity to achieve targets.

Accrual-based Earnings Management

According to Nugroho and Eko (2012), there are two categories of accruals: discretionary accruals (DA), which can be controlled and manipulated by managerial policies, and non-discretionary accruals (NDA), which are accrual components that are not controlled and manipulated by earnings management policies. Additionally, generally accepted accounting principles (GAAP) have a degree of flexibility that makes accrual-based earnings management by corporate managers possible. Accounting discretions built into GAAP provide opportunities for corporate managers to change income numbers (either upward or downward) (Li, 2018).

Real Earnings Management

Real Earnings Management means accelerating earnings by altering certain company operations (Roychowdhury, 2006). The evidence shows managers favor the real earnings management approach (Graham et al., 2005). While (Gunny, 2010) indicated the management of real practices is much more costly to companies and their shareholders and less costly for managers. Real earnings management imposes high long-term costs on shareholders (Roychowdhury, 2006; Cohen et al., 2008a). Additionally, Roychowdhury (2006) and Zang (2012) pointed out that real earnings management strategies do not help firms' growth and competitive characteristics because of their long-term impact on overproduction, income manipulation, and discretionary cost reduction, (Dakhlallh et al., 2020). Since manipulating real activities leads to adverse

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economic consequences, understanding how to reduce this opportunistic behavior is a critical issue, especially after the study by (Graham et al. (2005) discovered that real earnings management activities are a common practice.

Audit Quality

According to Alabdullah and Ahmed (2020) auditing is the main contributor to financial stability, trust, and market confidence. According to the legislation, auditors are in charge of performing statutory audits and significantly impact the legal services' opinions on the accuracy and fairness of financial accounts (Nwoye et al., 2021). Accordingly, DeAngelo (1986) indicated the likelihood that an audit may find and identify substantial errors in financial statements by accounting standards.

Additionally, Donatella et al. (2019) noted to the factors that affect audit quality are tenure, number of clients, size and clients' financial health, the presence of third parties who will review the audit reports, efficient independent auditors, level of audit fees, and the level of audit quality planning. Thus, Auditing is an important contributor to monetary constancy, the re-establishment of the company, and market and consumer confidence Alabdullah and Ahmed (2020). Consequently, audit quality is one of the corporate governance mechanisms; where the auditor should have high-quality management to minimize managers' manipulation (Rahman et al., 2021).

In the Jordanian context, adopting the Securities Law No. 76 of 2002 and Company Law No. 22 of 1997 helped advance the audit profession. According to Al-Akra et al. (2009), these regulations govern Jordan's corporate financial reporting structure and mandate the use of IFRS and ISAs. Additionally, the International Financial Reporting Standards (IFRS) and the International Standards on Auditing (ISA) were officially accepted in Jordan for the first time through rules released in 1998 regarding the Companies Law of 1997 (Almarayeh et al., 2020).

More recently, many of the requirements that auditors must meet to strengthen their independence were addressed by the Jordanian Corporate Governance Code (2009) and the last update of the regulations published by the Jordan Securities Commission (JSC) in 2017. Additionally, the majority of Jordan's audit market is made up of small businesses, even though many Big Four using their name or in association with Jordanian audit firms also operate there (Abdullatif & Al-Khadash, 2010; Abdullatif, 2016).

On the other hand, the Jordanian market's two key characteristics have an impact on the auditing practice. First, because the vast majority of Jordanian businesses are not publicly traded, the country's capital market is ineffective, small, and only moderately active in terms of trade. Second, there is less separation between management and ownership because most companies in the Jordanian market are family businesses (Almarayeh et al., 2020). Because of this, there is less demand for high-quality external auditing, which leads to increased competition among audit firms and lower audit fees. In addition, there is less chance of litigation against auditors, which increases the likelihood of lower-quality external auditing (Abdullatif, 2016).

Development of Hypotheses

When the interests of management collide with the interests of stockholders, management may not behave in the best interests of investors, according to agency theory. Management compensation is typically related to reported profitability; thus, managers have incentives and frequently the power to manage reported earnings (Healy & Wahlen, 1999). As a result, an auditor is obligated to provide reasonable confidence that financial statements are free of serious misstatements, thereby protecting stockholders' interests (Yasser & Soliman, 2018).

Therefore, the importance of auditing is centered on how the company discloses its results, and as we are aware, earnings management has become a global phenomenon in recent years (Hashim et al., 2019; Alabdullah & Ahmed, 2020). Additionally, the practice of profit management has been unfolded extensively, and companies are now judged on both their short- and long-term success in how they

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manipulate their earnings (Nwoye et al., 2021). Therefore, audit fees and Big 4 audit firms are suggested as factors that can represent audit quality (Raghunandan & Rama, 2007; Chi et al., 2011; Ettredge et al., 2014).

Audit Fees and Earnings Management

The literature has two contrasting arguments about the relationship between audit fees and earnings management. On the one hand, excessive audit fees may jeopardize auditor independence by creating an economic linkage between an audit company and its customers, creating incentives for auditors to facilitate earnings management (DeAngelo, 1981; Eshleman & Guo, 2014). On the other hand, high audit fees are associated with more audit effort and scrutiny, leading to greater earnings quality (Lin & Hwang, 2010; Alali, 2011). Furthermore, high audit fees are associated with audit firms' reputational capital, and hence high audit costs dissuade auditors from allowing earnings management (Frankel et al., 2002).

Moreover, due to Jordan's small stock market, audit firms have a limited customer base. Furthermore, moving auditors has no negative implications (Abdullatif, 2016). In such a situation, audit firms have competitive pressures to retain clients, particularly if their audit fees are quite high, and they may be ready to allow some discretion in reporting earnings by clients (Sharma et al., 2011).

Empirical evidence on the relationship between audit fees and earnings management is mixed (Lin & Hwang, 2010). Several studies confirm the first argument regarding the existence of a positive relationship between audit fees and earnings management (Sharma et al., 2011; Donatella et al., 2019). Also, Kim et al. (2020) find that real earnings management is positively related to audit fees, and they suggest that managers may engage in real earnings management.

Likewise, Jayeola et al. (2017) reported that the result from a sample of 15 Nigerian banks for the period from 2005-2014, that auditor independence (audit fees) has a significant positive effect on earnings management as managers deliver honourable costs and engage auditors in non-audit services to increase familiarity and reduce objectivity in the audit process thereby creating room for earnings management. Further, using a sample of financial Swedish companies for the period 2011-2013, Donatella et al. (2019) showed that the probability of earnings management increased if audit fees increased; which means a positive association between audit fees and earnings management.

Other studies support the second argument and document their negative association (Su et al., 2007). Likewise, Chi et al. (2011) examine the relationship between real earnings management and audit quality, and their findings reveal that higher audit fees constrain accrual earnings management. Hence, managers switch to real earnings management. As Martinez and Moraes (2014) indicated a negative association between audit fees and earnings management in the Brazilian market.

Similarly, Houqe et al. (2017) investigated the effects of audit quality (audit fees) on the earnings management of Indian listed firms, and they indicated that firms that employ high-quality auditors have a lower degree of accrual earnings management, meanings a negative association for audit quality (audit fees) with accrual earnings management. Additionally, Chang et al. (2021) Analyzed a sample of 12,823 firm-year observations from U.S. companies in non-regulated industries for the period 2000–2018, and they pointed out that earnings management is negatively associated with audit fees.

In contrast, some studies found that there is no association between audit fees and earnings management. Whereas Sitanggang et al. (2020) pointed out that there is no evidence of a significant relationship between audit fees and real earnings management for a large sample of UK manufacturing companies for the period 2010–2013. Moreover, Almarayeh et al. (2020) reported that the audit fees have no significant effect on discretionary accruals earnings management for a sample of Jordanian industrial firms during the period from 2012 to 2016.

These mixed findings can be caused by differences in economic conditions, audit markets, and regulatory environments across countries (Tendeloo & Vanstraelen, 2008). In this sense, Gu and Hu (2015) found that audit fees vary depending on the litigation environment, being higher in environments where litigation

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risk is higher. This situation, coupled with the low litigation risk in Jordan, leads to an expectation of a positive association between audit fees and earnings management (Almarayeh et al., 2020). Thus, based on prior studies that the audit fees constrain a company's ability to manage earnings via accruals-based and real activities, the hypotheses stated in the alternative form are:

H1: The audit fees positively affect accrual-based earnings management.

H2: The audit fees positively affect real earnings management.

Audit Firm Size and Earnings Management

A big audit company is seen as renowned and reputable, conducting high-quality audits. The Big 4 auditors can maintain a high level of audit quality because they have a larger number of clients, therefore their revenue streams are not affected by a single client, making them more independent (Yasser & Soliman, 2018). Widiastuty and Febrianto (2010) also noted that if the audit firm is small-sized, the audit firm's income is likely to be based mostly on the audit fee charged by certain clients, indicating that non-big four businesses tend to be more reliant on their clients than big four firms.

Furthermore, the Big 4 have greater chances to devote large resources to auditing. According to Lawrence et al. (2011), the largest audit companies have greater resources – both financial and operational – and hence can deliver superior services. DeAngelo (1981) and Lawrence et al. (2011) have mentioned the stronger capabilities that major audit companies have as a result of huge investments in audit technology and personnel training. As a result, the larger the audit firm, the greater the quality of the audit and the accounting information given.

Additionally, companies that pursue aggressive earnings management have the incentive to retain Big 4 audit firms because of their capacity to limit opportunistic accruals reporting (Francis, 2011). As a result, Big 4 audit firms have a greater power to control accrual earnings management, which may lead to clients resorting to real earnings management (Chi et al., 2011).

Empirical evidence showed mixed results, Soliman and Ragab (2013) and Inaam and Khamoussi (2016) confirmed that audit quality proxied by audit firm size is negatively associated with earnings management when earnings management is measured by using discretionary accruals. Further, Orazalin and Akhmetzhanov, (2019) investigated earnings management and audit quality in public companies listed on the Kazakhstan Stock Exchange during 2011-2016. The findings show that audit firm size negatively and significantly correlates with discretionary accruals. Whereas Alzoubi (2016) documented a negative significant association between auditor size and earnings management.

Moreover, Alhadab (2018) argue that high-quality audit is not a sufficient factor to reduce all forms of earnings management in the context of IPOs. In their case, high audit quality does indeed reduce discretionary accruals but most of these firms that have high-quality audits switch to real earnings management. This means that audit quality reduces the occurrence of accrual-based earnings management, but firms resort to real earnings management, (Rashid et al., 2015).

Meanwhile, Al-Mousawi and Al-Thuneibat (2011) found that Big Four and non-Big Four audit firms are not significantly different in their ability to restrict earnings management practices. Alves (2013) also mentioned that Big 4 audit firms are positively related to earnings management. Especially, from the research of Chi et al. (2011), higher audit quality (proxy as Big 4 audit firms) is indicated to be associated with more real earnings management due to constraining accrual-based earnings management.

Also, research by Choi et al. (2018) showed that when higher levels of real earnings management are noticed, audit firms are less likely to retain this client. In addition, Isaac (2022) studied a sample of French-listed firms covering a period from 2009 to 2016 and indicated that the clients of Big4 audit firms record higher levels of real earnings management and accruals earnings management, which means the positive association for audit firm size with real activities and accrual-based earnings management.

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On another hand, by examining UK IPOs between 1998-2008, Alhadab and Clacher (2018) found that the presence of Big 4 auditors cannot constrain all forms of earnings management (real activities and accrual-based). Also, using a sample of 1687 firm-year observations on listed companies in Vietnam; Khanh and Khuong (2018) pointed out that there is an insignificant effect of the audit firm size (Big 4) in diminishing real earnings.

Furthermore, in a sample from Egyptian listed firms during the period 2012-2016, Yasser and Soliman (2018) pointed out there is no significant relationship between the audit firm size and discretionary accruals, which means that Big 4 could not constrain the accrual earnings management that performed by managers. Whereas Almarayeh et al. (2020) confirmed through Jordanian context that the auditor size (Big4) has an insignificant influence on the discretionary accruals of the industrial sector during the period of 2012 to 2016. Thus, based on prior studies that the audit firm size (Big4) constrains a company's ability to manage earnings via accruals-based and real activities, the hypotheses stated in the alternative form are:

H3: The audit firm size (Big4) positively affects accrual-based earnings management.

H4: The audit firm size (Big4) positively affects real earnings management.

Research Methodology

Sample and Data Collection

The sample of the current study consists of the industrial and service firms listed on the Amman Stock Exchange (ASE) from 2012-2021. The industrial sector is regarded as one of the most important engines of economic and social development; also, the services sector plays an essential part in Jordan's promising modern economy. Furthermore, both industry and service activities have become critical components in achieving highly efficient growth, and it is crucial to choose which should be invested in and further expanded (Dakhlallh et al., 2020). Meanwhile, the financial sector was excluded from the sample since they are subjected to dissimilar regulatory and procedural requirements. Furthermore, they apply distinctive accounting practices and, therefore, capturing opportunistic earnings manipulations is more complex (Alyaarubi et al., 2021).

Therefore, the sample of the study included the industrial and service sectors from 2012 to 2021. However, some companies were excluded because they belonged to merged and liquidated firms or firms that did not have an available annual report. Thus, the final sample consists of firms listed and traded on ASE for the industrial and service firms (33 industrial firms, 41 service firms), which consists of 740 firm-year observations. The main source of data was the sample firms' annual reports published on the ASE's website corresponding to the period 2012-2021, and data were obtained from the firms' annual reports on the ASE's website.

Measurement of Variables

Dependent Variable: Earnings Management

Several models can be used to measure earnings management. In this study, we used Kothari model et al. (2005) Kothari model et al. (2005) to estimate AEM, and Roychowdhury model (2006) to REM.

Accrual Earnings Management

This study employs Kothari et al. (2005) performance-adjusted model to estimate discretionary accruals due to its higher power of discovery of earnings management and fewer misspecification problems. ROA is added to the model in order to control for extreme operating performance as this can bias the discretionary accruals estimation (Cohen & Zarowin, 2008; Alhadab et al., 2015). As shown in the equation below, all variables, except the constant, are deflated by the total assets at the end of the previous year in order to adjust the differences in firm size and to reduce problems of heteroskedasticity.

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$$TACCit\ /Ait\text{-}1 = \alpha 0 + \beta 1(1/Ait\text{-}1) + \beta 2\ (\Delta SALESit\text{-}\Delta REVit/Ait\text{-}1) + \beta 3\ (PPEit/Ait\text{-}1) + \beta 4\ ROAit\text{-}1 + \mu it \quad (2)$$

Where, for company, i and year t, TACCit reflects total firm accruals; Ait-1 total assets of firm; ΔSALESit is the change in net sales of firm; ΔRECit denotes the change in net accounts receivable of firm; PPEit is the level of gross property, plant, and equipment of firm; and ROAit is the rate of return on assets of firm.

Total accruals (TACC) are separated into two components: (i) nondiscretionary accruals, which equal the fitted value of total accruals obtained from estimating Eq. (2), and (ii) discretionary accruals (denoted by DA hereafter), which equal the residuals (i.e., ∈it) from estimating Eq (2).

The DA reflects the unexplained part of TACC. Since corporate executives may either adjust earnings up or down (Hribar et al., 2006; Roychowdhury, 2006), we use the |DA|, the absolute value of discretionary accruals to measure the degree of accrual-based earnings management (AEM). Last but not least, we estimate the equation by year–industry, using two-digit Standard Industrial Classification (SIC) codes and at least ten observations (Klein, 2002) .

Real Earnings Management

We use (Cohen & Zarowin, 2010) and (Roychowdhury, 2006) models to measure a total estimate based on operating cash flows of abnormal (CFO), production costs of abnormal (PROD) and discretionary expense of abnormal (DISEXP) to calculate the manipulation of real operations.

Cash Flow from Operations

This approach can enhance the current period's earnings and sales volume, dissembling a positive margin. In addition, saving price discounts and credit terms will further reduce the permissive current-period cash flow producing in operating cash flow of abnormal. Operating cash flows of abnormal value will decrease owing to sales manipulation so that real earnings management will be poor if the cash flows from abnormal value operations are high. The follows of the estimates:

$$〖CFO〗\_it/A\_(it\text{-}1) = \alpha 0 + \beta 1(\ 〖1/A〗\_(it\text{-}1)\ ) + \beta 2\ (\ 〖S\_it/A〗\_(it\text{-}1)\ ) + \beta 3\ (\ 〖\ 〖\Delta S〗\_it/A〗\_(it\text{-}1)\ ) + \varepsilon\_it \quad (1)$$

Where CFOi,t Cash flow operation, Ai,t-1 total assets of firm i at the end of period t, Si,t is the Sales of firm i during period t, ΔSi,t change of sales (ΔSi,t = Si,t-Si,t-1). Abnormal CFO obtained residual value from equation (1).

Discretionary Expenses

Corporations may reduce expenses of discretionary such as general management, expenditure related to development and research, advertisement, and sales. This scenario can improve current period earnings and cash flow with the risk of reducing future period cash flows. Reduction in discretionary load would reduce discretionary expenses with an abnormal value, thus, if the amount with abnormal discretionary expenses was high, REM would reduction. Hence, we estimate discretionary expenses are following:

$$〖DISX〗\_it/A\_(it\text{-}1) = \alpha 0 + \beta 1\ (\ 〖1/A〗\_(it\text{-}1)\ ) + \beta 2\ (\ 〖S\_it/A〗\_(it\text{-}1)\ ) + \varepsilon\_it \quad (2)$$

Where DISXi,t is firm' discretionary expenditure i in period t, (amount of sales and general expense, the expense of advertising and expense of development and research), Si,t is previously sales. Discretionary expenses of abnormal acquired residual value from equation (2).

Production Cost

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Companies should generate more good units than necessary in order to increase earnings so that operations would reduce the cost of the products sold. Due to the overproduced, that minimize the sold goods' cost is induced by the perversion of the costs of fixed overhead by a greater number of units. Furthermore, if management manipulates earnings through overproduction, it may result in an abnormally rise production costs' level. Therefore, the production cost is the change in inventory and the number of goods sold (Roychowdhury, 2006; Sun et al., 2014) .

$$〖PROD〗_{it}= 〖COGS〗_{it}+ 〖\Delta INV〗_{it} \quad (3)$$

Where COGSi,t are goods sold cost of the firm i in pierod t, ΔINVi,t is the inventory' change of firm i in pireod t. We estimate the following regression model to calculate production costs of abnormal (PRODi,t):

$$〖PROD〗_{it}/A_{(it-1)}= \alpha 0+ \beta 1 \left(〖1/A〗_{(it-1)} \right) +\beta 2 \left(〖S_{it}/A〗_{(it-1)} \right)+\beta 3 \left(〖 〖\Delta S〗_{it}/A〗_{(it-1)} \right)+\beta 4 \left(〖 〖\Delta S〗_{(it-1)}/A〗_{(it-1)} \right) +\varepsilon_{it} \quad (4)$$

Where PRODi,t Production cost, ΔSi,t-1 sales' changing. Abnormal cost of production acquired residual value from equation (4). REM's final estimate is abnormal costs of production, calculated by equation's residual value (4). A large PRODi,t value, shows high REM due to overproduction contributes to a higher value of elevated production costs.

Total Real Earnings Management

To estimate the percentage of Real Earnings Management (REM), we combine the residual values from equations (1) and (2) with a factor of (-1). This adjustment ensures that the real cash flow from operations and the abnormal discretionary expenses are smaller than the expected cash flow from operations and discretionary expenses under normal conditions. This typically occurs when a company engages in activities such as discretionary expense management or sales manipulation.

The measure for REM is derived from summing the residuals of the three proxies—abnormal cash flow from operations (ABCFO), abnormal discretionary expenses (ABDISX), and abnormal production costs (ABPROD) which are then combined into a single metric. This approach allows us to transform variations in different operational processes into one consolidated unit, as suggested by Chi et al. (2011), Cohen & Zarowin (2010), and Cohen et al. (2008b).

The larger the resulting REM value, the higher the degree of real activities manipulation by the corporation. The equation used to calculate REM is as follows:

$$REM_{it}=-(ABCFO_{it})-(ABDISX_{it})+(ABPROD_{it})$$

The primary objective of our study is to assess the impact of audit quality on both accrual earnings management (AEM) and real earnings management (REM). To achieve this, we use the absolute values of the residuals derived from Roychowdhury's model (2006) for REM and Kothari et al.'s model (2005) for AEM in our multivariate analyses. These regressions are performed cross-sectionally, considering each sector and each year individually. By utilizing the absolute values, we can accurately estimate the degree of earnings management, regardless of whether it results in income increasing or decreasing.

Independent Variable: Audit Quality

Audit firm size: Audit firm size (B4) is defined as a dummy variable that obtains the value of 1 if the financial statements of the firmi in the periodt were audited by a Big Four audit firm and zero (0) otherwise.

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Audit fees: Audit fees (AFEE) are defined as the natural logarithm of audit fees consistent with former empirical examinations (Almarayeh et al., 2020; Sitanggang et al., 2020; Chang et al., 2021; Alyaarubi et al., 2021),audit fees (AFEE) are defined as the natural logarithm of audit fees.

Control Variables

Following earlier studies, the model includes several variables that indicate firm characteristics and earnings management motivations. So, controlling the determinants will lead to stronger findings in future earnings management studies because they help mitigate the impact of omitted variables on earnings management (Dechow et al., 2012).

Firm size: Earlier earnings management research frequently employed the size of the company as a control variable. The mixed data indicate that there is no directional association between firm size and earnings management (Almarayeh et al., 2020). While Chung et al. (2002) find that larger enterprises manipulate earnings to report more predictable earnings, another study (Ballesta & Garcia-Meca, 2005) finds that large firms participate in earnings management to a lesser extent. Firm size (FZ) is computed as the natural logarithm of total capital.

Financial leverage: Many studies have demonstrated that financially challenged enterprises prefer to manage earnings in order to benefit from debt restructuring (Kim & Sohn, 2013). Another point of view is that heavily leveraged enterprises may face increased scrutiny from their lenders, reducing earnings management (Choi et al., 2004). Therefore, the sign for the relationship between company leverage and earnings management cannot be predicted due to such variable conditions (Almarayeh et al., 2020). Financial leverage (LEV) is calculated by dividing total debt by total assets.

Table1: Summary Of Variables Measurement

Variable	Abbreviation	Definition
Earnings Management:		
Accrual Earnings Management	AEM	The absolute value of the discretionary accruals estimated following Kothari et al.'s (2005) model
Real Earnings Management	REM	The absolute value of the total real activities estimated following Roychowdhury's (2006) model
Audit Quality:		
Audit Firm Size	B4	Dummy variable which assumes the value of (1) if the firm is audited by a Big 4 firm and (0) otherwise
Audit Fees	AFEE	The natural logarithm of audit fees
Controls Variables:		
Firm Size	FSIZE	The natural logarithm of total capital
Financial Leverage	LEV	Total debt divided by total assets

Regression Equation Model

This study employed panel data regression analysis to rigorously test two hypotheses, as it explored the relationships between multiple dependent variables: accrual earnings management (AEM) and real earnings management (REM). The use of panel data was particularly advantageous in this context as it allowed the integration of both cross-sectional data (observations across different firms) and time series data (observations over time). This dual-dimensional approach enabled a more nuanced understanding of the dynamics at play, capturing the variability within individual firms over time while also accounting for differences across firms. The central objective of this research was to examine how various aspects of audit quality influenced these two forms of earnings management, providing insights into the effectiveness of audits in curbing or facilitating earnings manipulation.

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Volume: 3, No: 5, pp. 1336 – 1351
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i5.3977

The first regression model was designed to analyze the determinants of accrual earnings management (AEM), denoted as AEM_{it}. This model considered a range of independent variables that were hypothesized to influence the level of accrual earnings management within a firm. The regression equation for this model was expressed as follows:

$$AEM_{it}=\beta_0+\beta_1 B4_{it}+\beta_2 AFEE_{it}+\beta_3 FSIZE_{it}+\beta_4 LEV_{it}+\epsilon_{it} \quad \text{(Eq1)}$$

In this equation, AEMit represented the level of accrual earnings management for firm iii at time ttt. The term β0 was the intercept, capturing the baseline level of AEM when all independent variables were equal to zero. The coefficients β1, β2, β3, and β4 corresponded to the independent variables: audit firm size (B4it), audit fees (AFEEit), firm size (FSIZEit), and financial leverage (LEVit), respectively. Each of these coefficients indicated the expected change in AEM associated with a one-unit change in the corresponding independent variable, holding all other variables constant. The error term, ϵit\epsilon_{it}ϵit, accounted for the portion of AEM that was not explained by the model, capturing unobserved factors and random variation.

The second regression model similarly examined the impact of audit quality on real earnings management (REM), denoted as REMit. Real earnings management involved strategies that directly affected the firm's operational decisions, such as timing of sales or altering production levels, to meet certain financial targets. The regression equation for this model was specified as:

$$REM_{it}=\beta_0+\beta_1 B4_{it}+\beta_2 AFEE_{it}+\beta_3 FSIZE_{it}+\beta_4 LEV_{it}+\epsilon_{it} \quad \text{(Eq2)}$$

In this equation, REMit represented the level of real earnings management for firm iii at time t. The structure of this equation mirrored that of the first, with β0 again serving as the intercept, and the coefficients β1 through β4 representing the influence of the independent variables on REM. The error term ϵit captured the unexplained variation in REM, analogous to its role in the AEM model.

The independent variables in both models where audit firm size (B4it), audit fees (AFEEit), firm size (FSIZEit), and financial leverage (LEVit) were chosen for their potential influence on earnings management practices. Audit firm size (B4it) was a binary variable that took the value of 1 if a Big 4 audit firm audited the firm and 0 otherwise, reflecting the general belief that larger, more reputable audit firms might be more effective in constraining earnings management. Audit fees (AFEEit) were measured as the natural logarithm of the fees paid to the auditors, under the hypothesis that higher fees might indicate either more rigorous auditing or an economic dependence that could compromise auditor independence. Firm size (FSIZEit) was typically represented by the natural logarithm of total assets, reflecting the company's scale, which could influence its ability to manage earnings and its scrutiny by auditors. Financial leverage (LEVit) was calculated as the ratio of total debt to total assets, capturing the firm's debt burden, which might motivate earnings management to meet debt covenants or other financial obligations.

By applying these models, the study aimed to thoroughly investigate and quantify the impact of audit quality indicators on earnings management practices across a sample of firms. The results from these analyses were expected to provide valuable insights into the role that audit quality played in either mitigating or facilitating earnings manipulation. Such insights were crucial for regulators, auditors, and corporate governance bodies, as they could inform policies and practices designed to enhance financial reporting quality and protect the interests of stakeholders.

Result and Discussion

Descriptive Statistics

Table 2 supplies descriptive statistics of the variables used in the regression analysis for the sample of 740 firm-year observations from 2012-2021. Table 2 provides that the absolute values of accrual earnings management, estimated utilizing the Kothari et al. model (2005) (AEM), have a mean of 0.0186 and a

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DOI: https://doi.org/10.62754/joe.v3i5.3977

standard deviation of 0.0157, meaning that the total volume of accrual earnings management is 1.86% of lagged total assets. While the absolute values of real earnings management, estimated utilizing the Roychowdhury model (2006) (REM), have a mean of 0.0026 and a standard deviation of 0.4822, meaning that the total volume of real earnings management is 0.26% of lagged total assets. This indicates that these values are comparable with earlier evidence such as (Alzoubi, 2017; Habbash & Alghamdi, 2016).

Table 2: Descriptive Statistics

	AEM	REM	AFEE	B4	FSIZE	LEV
Mean	-0.018615	-0.002558	9.276571	0.439189	7.167015	0.361707
Maximum	0.036580	3.530315	11.59910	1.000000	8.273001	1.060530
Minimum	-0.035136	-3.909329	6.684612	0.000000	5.744293	0.008158
Std. Dev.	0.015674	0.482247	0.695490	0.496624	0.480935	0.237417
Observations	740	740	740	740	740	740

Regarding the independent variables, Table 2 shows the proportion of audit fees (AFEE) paid to the audit firms by their clients has a mean of 9.2765, which indicates that audit firms earn fees premium. While the proportion of audit firm size (B4) has a mean of 0.4392 (43.92%). Further, Table 2 displays the value of control variables, the mean of firm size (FSIZE) is 7.1670, meanwhile, 0.3617 is the mean of financial leverage (LEV).

Correlation Analysis

The correlation coefficient of the variables presents in the following Table 3 It is observed that all the coefficients are less than 0.8, which signifies fewer multicollinear problems. Yoshikawa and Phan (2003) mentioned that the model had no issues with multicollinearity, which generally requires 80% or more to confirm that the correlations between variables exist. Hence, the correlation analysis displays that multicollinearity is not a problem. Furthermore, variance inflation factors (VIF) are low (all values are smaller than 0.8), validating the preceding result.

Table 3: Correlation Analysis

Correlation							
Probability	AEM	REM	AFEE	B4	FSIZE	LEV	VIF
AEM	**1.0000**						
REM	0.0696***	**1.0000**					
AFEE	0.0943**	-0.0422	**1.0000**				1.5604
B4	-0.1413*	0.0696***	0.5173*	**1.0000**			1.3899
FSIZE	-0.0767**	0.0581	0.3421*	0.1816*	**1.0000**		1.1599
LEV	-0.0869**	-0.0141	0.2093*	0.0420	0.1932*	**1.0000**	1.0745
* significant at 1%. ** significant at 5%. *** significant at 10%. AEM: accrual earnings management; REM: real earnings management; AFEE: audit fees; B4: audit firm size; FSIZE: firm size; LEV: financial leverage.							

A consideration of correlation coefficients in Table 3 emphasizes several observations. First, the level of accruals earnings management (AEM) is positively correlated with audit fees (AFEE) significantly at 10%, while it is negatively correlated with audit firm size (B4) at 1%. Meanwhile, the level of real earnings management is negative but insignificant with audit fees (AFEE), where it is positive with audit firm size (B4) significantly at 10%.

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Second, in terms of the control variables, firm size (FSIZE) and financial leverage (LEV) are negatively associated with the level of accrual earnings management (AEM) at 5% significance, while firm size (FSIZE) and financial leverage (LEV) are insignificant with real earnings management (REM).

Additionally, it is worth mentioning that one of the highest correlations found is between the audit fees (AFEE) and audit firm size (B4) 0.5173 significantly at 1%, this correlation indicates that a larger auditor size implies charging higher audit fees. Meanwhile, the second-highest correlation is between audit fees (AFEE) and firm size (FSIZE) 0.342 significantly at 1%, meanings that large firms tend to pay high audit fees, further, audit fees (AFEE) have been associated positively with financial leverage (LEV) at 1%. On another side, audit firm size has a high correlation with firm size (0.1816 at 1%), which means the large firm size tends to editors' size (B4). While no association between B4 with financial leverage.

Regression Analysis Results

Table 4 shows the regression findings of the audit quality (audit fees and audit firm size) on accrual-based earnings management and real earnings management as a proxy for earnings management in Jordanian companies. As a balanced panel data is used, the Hausman test was run to choose which model is best suited to the data (fixed effect or random effect). The value was significant (P = 0.000) and, therefore, the null hypothesis cannot be rejected. Thus, the fixed effect model is considered as the most appropriate for the current study.

Table 4: Regression Analysis Results

	AEM				REM			
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient	Std. Error	t-Statistic	Prob.
AFEE	0.00043	0.000177	2.40606	0.0164**	-0.157343	0.044610	-3.527103	0.0004*
B4	-0.00022	7.82E-05	-2.82939	0.0048*	-0.117992	0.048363	-2.439702	0.0150**
FSIZE	0.001196	0.001024	1.167830	0.2433	0.220102	0.038753	5.679626	0.0000*
LEV	-0.75603	0.016213	-46.6307	0.0000*	0.186398	0.141069	1.321325	0.1868
C	-0.01409	0.007388	-1.90784	0.0568	-0.647361	1.861447	-0.347773	0.7281
R-squared	0.396209				0.345794			
F-statistic	2259.540				25.22317			
Prob (F-statistic)	0.000000				0.000000			
Mean dependent var	-0.018615				-0.002558			
S.D. dependent var	0.015674				0.482247			
Durbin-Watson stat	1.808717				1.889434			

*** significant at 1%. ** significant at 5%. *** significant at 10%.**
AEM: accrual earnings management; REM: real earnings management; AFEE: audit fees; B4: audit firm size; FSIZE: firm size; LEV: financial leverage.

Table 4 above shows the effect of audit quality on earnings management in Jordanian companies. The hypotheses evaluated in the current research are four. The research model shows that earnings management is measured by accrual earnings management and real earnings management. The model generates an R-squared of 0.396209: 0.345794, F-value is 2259.540: 25.22317, and P value is 0.000: 0.000, Durbin-Watson is 1.808717: 1.889434 for accrual earnings management (AEM) and real earnings management (REM) respectively.

Table 4 documents that in Model 1, audit fees have a positive effect on accrual earnings management (AEM), this indicates that audit fees may motivate managers on accrual-based earnings management practices. Hence, Hypothesis 1 is accepted. While Model 2 shows that audit fees have a negative effect on real earnings management (REM), meanings that audit fees have the ability to limit real activities' earnings management. Thus, Hypothesis 3 is rejected. As a result, given Jordan's low level of audit fees and low

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litigation risk, audit fees are unlikely to serve as a motivator to increase audit efforts to limit earnings management, particularly in accrual-based accounting, and thus audit fees have no effect on earnings management. However, audit fees have the potential to limit genuine activities due to managers' shift to accrual manipulation and problems practice of earnings management via real activities.

Furthermore, Table 4 indicates that models 1 and 2 have similar findings for the audit firm size (B4), which means that audit firm size (B4) is successful in restricting accrual earnings management (AEM) and real earnings management (REM) in Jordanian companies. Thus, Hypotheses 2 and 4 are rejected. Therefore, these results can be explained by the plans that the government has developed in order to create a safe investment environment and create a legal environment that helps the auditor to carry out his duties with full transparency and integrity. So, auditors are motivated to determine earnings management behaviour (accruals-based and real-activities).

Considering the findings of Hypotheses 1, 2, 3, and 4, it is possible to conclude that audit quality attributes (audit fees and audit firm size) do influence the level of earnings management practiced by Jordanian firms. This achievement can be credited to the Jordanian institutional and economic context that the government has created, which encourages auditors to perform high-quality audits.

The findings in Table 4 reflect control variables indicating that the coefficient of firm size (FSIZE) has an insignificant effect on accrual earnings management (AEM) while having a positive effect on real earnings management (REM). Secondly, the findings show that financial leverage has a negative effect on AEM and is insignificant on REM.

Conclusions

The current study aimed to shed new light on how audit quality can limit earnings management in a developing country, Jordan, whose cultural, economic, and institutional context is very different from other countries. To achieve the objective of the current study, this study examined whether attributes of the audit quality (i.e. audit fees and audit firm size) have an influence on discretionary accruals and real activities, as proxies of earnings management, for the industrial and service sector listed on the ASE during the period 2012–2021.

The findings suggest that audit fees and audit firm size significantly affect earnings management. Furthermore, audit fees have a positive influence on accrual earnings management and a negative effect on real earnings management. Therefore, the findings of this study present new evidence regarding the impact of the level of audit fees on earnings management. Concerning audit firm size (B4), the findings showed that the B4 has a negative effect on accrual and real earnings management (AEM and REM). These findings support the authors' expectation that audit firm size (B4) affects earnings management negatively.

The findings of the current study corroborate the agency theory's view of auditing's role in limiting earnings management activities. As a result, this study adds to the ongoing debate and controversy about the role of audit quality in limiting earnings management. Therefore, the findings of the current study can be helpful for regulators and auditing standards-setters in Jordan and other countries with similar institutional settings, as they imply that recent regulatory reforms in Jordan have begun to be effective in limiting earnings management practices.

Finally, the current study adds new empirical evidence to the Jordanian literature. Furthermore, as far as the authors are aware, this is the first study to look into the effect of audit quality in limiting profits management through discretionary accrual and real activities. Furthermore, various proxies for audit quality, such as industry specialist auditors or tenure, are hampered in Jordanian enterprises due to a lack of information and varied reporting formats. As a result, just two variables (audit fees and audit firm size) were considered in this investigation.

As a result, if such data become more readily available, the relationship between audit quality and earnings management in Jordan should be explored further in future studies. Furthermore, using different audit

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DOI: https://doi.org/10.62754/joe.v3i5.3977

quality proxies could be a possible option for future research. In addition, other corporate governance structures, such as the board of directors and audit committees, should be considered by future researchers in constraining earnings management in Jordan.

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Journal of Ecohumanism
2024
Volume: 3, No: 5, pp. 1336 – 1351
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i5.3977

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