IJAAF; Vol. 10, No. 2, Spring 2026, Serial 35

Ferdowsi University of Mashhad

Iranian Journal of
Accounting, Auditing & Finance

Quarterly

RESEARCH ARTICLE

Audit Fees under Dual Earnings Management: The Moderating Role of Accruals in the REM-Audit Fee Nexus

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How to cite this article:
Jalali, S. H. , Hemmati, H. , Faraji, O. and Jabbari, H. (2026). Audit Fees under Dual Earnings Management: The Moderating Role of Accruals in the REM-Audit Fee Nexus. Iranian Journal of Accounting, Auditing and Finance, 10(2), 171-195. doi: 10.22067/ijaaf.2026.47628.1595
https://ijaaf.um.ac.ir/article_47628.html

ARTICLE INFO

Article History
Received: 2024-07-11
Accepted: 2025-11-03
Published online: 2026-04-12

Keywords:
Accrual Earnings Management, Audit Fees, Dual Earnings Management, Real Earnings Management, Moderating Role

Abstract

As financial reporting becomes increasingly complex, both real earnings management (REM) and accrual-based earnings management (AEM) pose challenges for auditors in risk assessment and fee determination. While prior studies have examined these strategies in isolation, scant attention has been paid to their concurrent use, dual earnings management, particularly in audit pricing. Existing literature lacks analyses of the REM–AEM interaction within moderating frameworks, leaving unclear how AEM intensity moderates the REM–audit fee relationship. This gap impedes understanding of audit pricing in information-asymmetric settings and may lead to suboptimal audit judgments. To address this gap, this study investigated how AEM moderates the relationship between REM and audit fees. The study offered three novelties. First, it is the first in the domestic literature to examine the REM–AEM interaction. Second, it treated AEM as a moderator, revealing how auditors respond to compounded informational risk. Third, it provided evidence from the Iranian capital market, offering a practical framework for audit risk assessment in low-transparency environments. Using data from 72 firms listed on the Tehran Stock Exchange (2013–2025), results indicated a positive and significant relationship between REM and audit fees. A negative and significant interaction between REM and AEM emerges only when AEM is measured by the Kothari model. Results showed that using both strategies simultaneously affects auditors' risk perceptions and weakens REM's direct impact on audit fees. The study contributed to audit pricing theory by bridging behavioral and signaling perspectives, and presents practical implications for auditors as well as regulators and standard-setters.

https://doi.org/10.22067/ijaaf.2026.47628.1595

NUMBER OF REFERENCES
46

NUMBER OF FIGURES
0

NUMBER OF TABLES
10

Homepage: https://ijaaf.um.ac.ir
E-Issn: 2717-4131
P-Issn: 2588-6142

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1. Introduction

The link between earnings management and audit fees is a mainstay of accounting research for decades, with the relationship having received considerable attention within the literature (Ashbaugh et al., 2003; Frankel et al., 2002; Schroeder, 2002). As per ReferenceSchipper (1989), earnings management refers to a purposeful intervention in the financial reporting process, with the intent of obtaining some predetermined target earnings. Such intervention can take the form of income-increasing, -decreasing, or -smoothing behaviors. Earnings management would be a general term, but it can be categorized into two types, namely accrual-based earnings management (AEM) and real earnings management (REM), where AEM refers to the manipulation of accounting accruals and estimates, while REM is related to operational actions (Choi et al., 2022). When both are used concurrently, the practice is known as dual earnings management. Accumbent complexity in the process of auditing could skew the risk assessment, coupled with the authenticity of reporting by auditors.

AEM and REM both impact audit pricing directly, as they increase perceived audit risk and complexity. AEM, in particular, raises the audit fees due to higher accounting estimation risk and potential misstatement, whereas REM increases the audit fees owing to operational and business risk, which requires more extensive audit effort. Thus, the interplay of these two strategies can lead to substantial changes in auditors' risk assessments and pricing decisions. Evidence from previous studies also indicates that both accrual-based and REM have the potential to lower the quality of financial reporting and affect auditors' readers about subsequent risk (Sun et al., 2014). Such factors together create informational asymmetry in the context of earnings management that increases audit risk (Choi et al., 2024; Kim and Park, 2014; Krishnan et al., 2013; Kyriakou, 2025), which could increase audit fees. Thus, for practitioners and regulatory entities alike, it is essential to develop a more in-depth knowledge regarding the impact of different forms of earnings management on audit fees.

The link between REM and AEM, the two most common kinds of earnings management, and audit pricing has received less research than the relationship between earnings management and audit fees. The majority of previous research has examined these management techniques independently, without considering their interplay or relative impact on audit fee structures. For instance, different studies have looked at how REM or AEM affect audit fees separately (Almarayeh et al., 2020; Azad et al., 2023; Choi et al., 2022; Egbunike et al., 2023; Emadoddini and Saeedi, 2019; Hussien et al., 2024; Sitanggang et al., 2020), but there is not much information regarding how auditors react when both methods are used at once. Due to this lack of clarity, auditors may have a more difficult time doing risk assessments and estimating audit effort accurately.

Specifically, there has been a dearth of studies that employ moderating frameworks to conduct interactive analyses between REM and AEM, which is the root cause of the current knowledge gap. Put simply, the impact of AEM intensity on the correlation between REM and audit fees is still not well understood. As a result, auditors may make less-than-ideal decisions due to a lack of understanding of audit pricing mechanisms in information-asymmetric settings.

The study seeks to fill this gap by examining the moderating role of discretionary accruals as a proxy for AEM on post-audit fees. In particular, it investigates whether discretionary accruals weaken or strengthen the relationship between REM and audit pricing. Utilizing a quantitative approach and an empirical modeling based methodology, the study investigates the collective effect of these two managerial behaviours on audit fee setting. The analysis focuses on the case where firms dual engage in REM and AEM, which forces their auditors to update (or better) adjust for potentially contradictory information provided by managers.

The novelty of this study lies in three key dimensions. This study is, to the best of the author's

knowledge, the first in domestic literature that systematically ponders the interactive role of REM and AEM in contrast with previous literature, where literature has mostly treated them separately. Second, it provides a fresh view for auditors' reactions to the increased informational risk by suggesting AEM as a moderating variable. Third, by presenting empirical evidence from the Iranian capital market, the study provides a practical framework for assessing audit risk and estimating audit fees in environments characterized by low financial transparency. More broadly, all the contributions together will help develop a theoretical understanding of interactions between earnings management and audit fees.

Finally, answering this research question can provide useful insights for regulation-oriented organizations such as the Securities Exchange Organization and Audit Organization in Iran, as well as the Iranian Association of Certified Public Accountants. Insights into AEM's potential moderating role in the REM and audit fees relationship can aid in creating more focused audit pricing models, as well as aiding the identification of high-risk managerial behavior of firms that need increased scrutiny/intervention, helping enhance audit quality in the capital market.

2. Literature review and hypothesis development

2.1. Audit fees: theoretical underpinnings and core determinants

Audit fees are an important outcome variable in the audit pricing literature as they denote the economic remuneration auditors receive for bearing professional risk, allocating resources, and providing assurance over financial statements (Simunic, 1980). The seminal work of Simunic (1980) demonstrated that audit fees are primarily a function of firm size, business complexity, and inherent risk; factors that collectively drive the scope and intensity of audit effort. Subsequent research has expanded this framework by incorporating agency conflicts, information asymmetry, and managerial opportunism as key determinants of audit pricing (Abbott et al., 2006; Sohn, 2011). From the perspective of agency theory (Meckling and Jensen, 1976), external audits serve as a governance mechanism to align managerial behavior with shareholder interests. When managers engage in opportunistic actions, such as earnings manipulation, to mask poor performance or secure private benefits, auditors respond by intensifying procedures, increasing testing, and demanding higher compensation for elevated litigation and reputational risk (Greiner et al., 2017). Simultaneously, the theory of information asymmetry (Scott 2015) suggests that managers suffering from superior private information leads to uncertainty related to decisions made by outside stakeholders. In these circumstances, auditors serve as intermediaries between providers and users of information; the fees they charge increase with the incompleteness or opacity of financial reporting. Thus, this theory helps to guide our studies on how particular earning management forms (AEM & REM) affect audit fees. Both approaches represent managerial efforts to manage reported earnings; however, they differ significantly in terms of implementation, salience, and perceived risk, which reflects back into divergent, and possibly interrelated, effects on audit pricing.

2.2. AEM and its impact on audit fees

AEM essentially refers to the manipulation of accounting accruals, estimates or discretionary judgment available within the flexibility allowed by the relevant accounting standards (Jones, 1991). Although such practices may be technically in accordance with regulations, they can mask the economic reality and signal potential underlying financial distress or opportunism (Healy and Wahlen, 1999). According to signaling theory (Spence, 1978), abnormal accruals act as negative signals that make it harder to see through the finances and make auditors more skeptical. Empirically, AEM has been consistently linked to higher audit fees. Abbott et al. (2006) found that the direction

of accrual manipulation is critical, such that income-increasing AEM in high-litigation environments elicits meaningful fee premia. In a study based in the UK, Alhadab (2018) suggested that although good quality auditors place strong constraints on AEM, it still can be constraining as the existence of abnormal accruals without any evidence about the direction raises audit fees reflecting auditors' risk-averse behaviour. Working with data up to October 2023, Yu (2020) demonstrated that non-specialized auditors have a unique sensitivity toward AEM; they charge bigger fees when the industry is not their speciality, decreasing reliance on skills in this area and increasing uncertainty, which justifies paying increased fees for eliminating those risks. More recently, Choi et al. whereas "big bath" accounting is a form of aggressive AEM during restructuring (2024), which has been associated with substantial risk to the audit process and potential future restatement, leading to significantly higher audit fees due to that informational as well as re-statement risk. Similarly, Hussien et al. (2024) reported that in Jordan, the engagement of high-quality auditors mitigates AEM, but only when institutional oversight is strong. This implies that in weak governance settings, AEM remains a potent driver of audit pricing. In the case of Iran, Darogheh Hazrati and Pahlevan (2013) were among the first to document a positive association between earnings management (mainly AEM) and audit fees. Emadoddini and Saeedi (2019) confirmed the relationship and revealed that the rise in abnormal audit fees is positively correlated with both AEM and REM. Khoshkar et al. (2019) noted that poorer earnings quality, commonly proxied by AEM, corresponds with fee increases as the auditor's forward-looking risk assessment. Together, these studies are evidence that AEM is not just a technical accounting choice; it is also a strategic signal that auditors perceive as greater reporting risk and something for which they should be compensated at higher rates.

2.3. REM and its distinct risk profile

REM is based on real operational decisions, unlike AEM, and includes reducing research and development or ad spend, overproducing inventory to reduce costs per unit or selling with abnormal discount (Roychowdhury, 2006). Since these actions influence cash flows and economic substance, REM is often considered to be more expensive and potentially harmful for long-term firm value (Cohen et al., 2010). Moreover, REM is ineluctably more difficult to detect as it overlaps with legitimate business choices and thus heightens audit risk (Choi et al., 2018). Early empirical evidence that REM increases audit costs, even after controlling for AEM, is provided by Sohn (2011), who concludes that auditors regard it as an independent risk. Greiner et al. 2017 framed "business risk" as the driver of REM and not bucketing it purely as an accounting issue, arguing that auditors would adjust their fees to reflect concerns over future solvability or operational sustainability. Choi et al. (2018) reinforced this view, showing that REM exerts an incremental effect on audit fees beyond AEM, particularly in firms with weak governance. A more nuanced view was provided by Sitanggang et al. (2020), who recorded mixed effects of REM components. They found that audit fees went up when discretionary spending went abnormally low, but audit fees went down when operating cash flows went abnormally high, which could be because of the impression of liquidity strength. This illustrates why REM measures need to be disaggregated when evaluating audit risk. In emerging markets, the REM–audit fee link is even more pronounced. Egbunike et al. (2023) studied Nigerian firms and found a negative relationship between residual audit fees and real earnings smoothing, interpreting this as evidence of intensified auditor oversight that suppresses opportunistic behavior. The indirect positive link between EM and audit fees was verified by Kyriakou (2025) in a cross-country analysis during economic crises. This association was mediated by heightened audit risk, particularly for REM, which tends to soar during downturns. There is strong evidence within Iran to back this up. Abbaszadeh et al. (2017) used R&D cuts as a proxy for REM and found a significant positive link with audit fees, consistent with the notion that operational manipulation raises red flags.

Moradi et al. (2019) provided evidence that REM leads to a rise in audit fees of TSE firms and claim that this is due to low transparency and weak monitoring mechanisms. Research in this area has shown that auditors can identify and charge for this kind of manipulation; for example, Emadoddini and Saeedi (2019) found that REM and AEM independently predict abnormal audit fees, and Azad et al. (2023) found a negative association between abnormal fees and smoother operating cash flows and production costs, which may indicate REM. Taken together, these results highlight REM as a key factor influencing audit pricing, especially in contexts where information is scarce, such as Iran.

2.4. The concurrent use of REM and AEM: Dual earnings management and audit risk complexity

An emerging body of literature acknowledges that firms do not typically exclusively employ one strategy of earnings management. Instead, managers often resort to a practice termed dual earnings management (the joint utilization of REM and AEM) that would allow them to satisfy earnings targets while at the same time reducing detection risk (Cohen and Zarowin, 2010). This practice further exacerbates informational asymmetry and creates complex risk profiles that traditional audit models cannot capture. Conceptually, the interaction of REM and AEM components may be one of substitution or distraction rather than being additive. Signaling theory suggests that salient AEM may dominate auditors' attention, causing them to underweight subtler operational red flags (REM), suggesting that when confronted with multiple risk indicators, practitioners tend to prioritize those that are more salient or familiar, typically accrual-based measures, while paying less attention to real activities, which remains underexplored. While Choi et al. (2018) did note that REM and AEM had additive effects, they failed to account for potential moderating effects. Although there may be interdependencies between the two methodologies, Sohn (2011) and Greiner et al. (2017) handled them separately. Not even newer studies, such as Choi et al. (2022), which found auditors respond more to REM than AEM, did not consider the effect of one on pricing the other. The gap is sharper still in Iran. Although research by groups like Emadoddini and Saeedi (2019) and Moradi et al. (2019) has shown that REM and AEM each have their own effects, no studies have attempted to model the interaction between the two. Most studies have been conducted within the country use linear regression models that disregard possible non-linearities or moderation in favor of additive effects (Darogheh Hazrati and Pahlevan, 2013; Khoshkar et al., 2019). Even Azad et al. (2023), whose focus was not on how AEM would act to condition auditors' responses, nor indeed did they define the REM proxies they were themselves considering. For instance, Alavi Tabari and Haji Moradkhani (2015) and Haiderpoor and Jafari (2016) examined the audit pricing factors determining in Iran; however, they paid considerable attention to market structure or liquidity but ignored features that vary depending on earnings management. Analyzing risk committees, Kordsholi and Pajoohi (2024) found no significant effect on audit fees or reporting quality and demonstrated that attention to managerial behavior is needed. Is the fee response dampened by auditors' distraction caused by high AEM, or does it become even more pronounced? Given the potential for auditor independence restrictions, restricted transparency, and concentrated ownership in Iran to worsen cognitive biases and risk mispricing, this is an important question to ask.

The following section synthesizes the reviewed literature and outlines the hypotheses that form the basis of our empirical investigation.

2.5. Hypothesis development

Based on the theoretical and empirical foundations discussed earlier, we are now ready to make our guesses about how REM, AEM, and audit fees are related. We begin by suggesting that audit fees are positively correlated with REM, and then we postulate that AEM acts as an attention-diverting

signal to mitigate this correlation.

2.5.1. Direct effect: REM and Audit Fees

The likelihood of future financial trouble is increased because REM affects operational efficiency and puts substantial economic costs on enterprises (Roychowdhury, 2006; Cohen et al., 2010). Beyond simple financial manipulation, REM poses a risk to businesses. Greiner et al. (2017) noted that auditors see REM as a sign of aggressive management behavior that could threaten the company's long-term sustainability, which makes them increase charge premiums and conduct more rigorous testing. If there is little external oversight, market players may have a harder time spotting operational manipulations (Moradi et al., 2019). A large body of empirical research backs up this position. Auditors should consider REM as a separate risk factor, as Sohn (2011) discovered that it raises audit fees regardless of whether AEM is controlled for or not. In a similar vein, Choi et al. (2018) showed that REM affects audit pricing incrementally, especially in poorly governed environments. Findings from the Iranian studies by Emadoddini and Saeedi (2019) and Abbaszadeh et al. (2017) corroborate the positive correlation between audit fees and REM proxies, such as unusual reductions in research and development spending or increases in output, suggesting that auditors pay closer attention to unusual business practices. As a result, auditors should factor REM into their fee structures, in line with agency theory and the risk-based audit model. Therefore, we propose:

H1: REM is positively associated with audit fees.

2.5.2. Moderating effect of AEM

Although REM and AEM both increase audit risk, their detectability and prominence are different. Accrual error monitoring (AEM) provides a visual signal for auditors since it is quantitative, standardized, and integrated directly in financial statements (Abbott et al., 2006). On the other hand, REM is more difficult to separate since it is embedded in actual operational actions that frequently imitate valid business strategies (Choi et al., 2018). The notion of signals (Spence, 1978) states that auditors' attentional resources are monopolized by the dominant signal, which is AEM when it is pronounced. Due to time and mental limitations, auditors may put off operational studies that call for a more in-depth understanding of the business in favor of examining accrual abnormalities, for which detection mechanisms are already in place (Sohn, 2011; Yu, 2020). We explain how auditors prioritize competing risk signals by extending signaling theory, which helps to comprehend the moderating role of AEM. The auditors' interpretation and prioritization of the two earnings management strategies as competing risk signals is transformed by the stronger and more noticeable signal that AEM gives within this framework compared to REM. The empirical evidence backs up this method of prioritization: auditors pay greater attention to anomalies based on accruals and may pay less attention to the subtler signals linked with REM (Sohn, 2011; Yu, 2020). Consequently, when AEM is pronounced, it absorbs a disproportionate share of auditors' cognitive attention, reducing the incremental influence of REM on audit assessments and fee pricing. This mechanism provides the theoretical bridge that explains why AEM moderates the REM–audit fee relationship. This attentional bias implies that high levels of AEM may inadvertently mask or dilute the perceived severity of concurrent REM activities. This mechanism finds indirect support in recent literature. Similarly, Sitanggang et al. (2020) note that auditors' attention is conditional on the larger earnings management environment, since they see diverse fee reactions to various REM components. If auditors in Iran are too busy looking for anomalies in accruals to notice operational smoothing, then it stands to reason that smoother cash flow patterns, which could be an indication of REM, would be associated with reduced abnormal fees (Azadeh et al., 2023). Because of this theoretical uncertainty and the fact that previous research has not agreed on which way AEM acts as a moderator, we provide

a non-directional hypothesis:

H2: AEM moderates the relationship between REM and audit fees.

This hypothesis advances audit pricing theory by integrating insights from behavioral decision-making into traditional risk models, offering a more realistic account of how auditors process multiple, concurrent risk signals in practice.

3. Research methodology

This applied, correlational study employs an ex post facto design, utilizing historical data. The study hypotheses are tested using panel regression models, which are a quantitative methodology. Statistical techniques were carried out in Stata (version 14), following initial data preprocessing in Excel. The theoretical framework was built through library research and documentary analysis. Sources for the data included audited financial accounts and official databases such as Rahavard Novin, the Statistical Center of Iran, Codal, and the Tehran Stock Exchange. The study population consists of companies that have been listed on the Tehran Stock Exchange from 2013 to 2025. These companies were chosen based on certain criteria: (1) they have been listed continuously since 2013; (2) they are not involved in financial, insurance, or banking activities; (3) their fiscal year ends in Esfand (March) and has not changed throughout the study period; (4) there must be at least eight firms per industry for effective cross-sectional earnings management estimation, in accordance with Banimahd et al. (2022) and Hajiha and Chenari Bouket (2016), and (5) information about audit fees must be publicly available (Banimahd et al. (2022) and Hajiha and Chenari Bouket (2016)). The research period (2013–2025) is reported in Gregorian years corresponding to the Iranian fiscal years 1391–1402 (2012-2023). Each fiscal year spans parts of two Gregorian years. Considering the study period and the aforementioned restrictions, the total number of observations is 864 firm-years. The data screening process is presented in Table 1.

Table 1. Final sample selection steps

Description	Number of Firms	Number of Observations
Total listed Companies by the end of 2025	460	5520
Subtracted: Companies not listed since 2013	(34)	(408)
Subtracted: Companies delisted from 2013 to 2025	(74)	(888)
Subtracted: Specialized investment, insurance, and bank companies	(73)	(876)
Subtracted: Companies with a fiscal year not end in Esfand	(76)	(912)
Subtracted: Companies that changed their fiscal year	(25)	(300)
Subtracted: Industries with fewer than eight companies	(35)	(420)
Subtracted: Companies with unavailable data or not disclosing audit fees	(71)	(852)
Remaining	72	864

3.1. Data analysis method and testing of classical regression assumptions

A multivariate panel regression was used to test the hypotheses put forth, and a series of diagnostic checks was performed to ensure compliance with classical regression assumptions. Variance inflation factor (VIF) values were all below ten, suggesting the absence of serious multicollinearity. Indeed, the panel structure of our dataset and the inclusion of industry and year controls led us to expect that heteroscedasticity and autocorrelation were present. To address both issues simultaneously, the models were estimated using ordinary least squares with robust standard errors (vce(robust)). To mitigate potential distortions from non-normality and outliers, variables were log-transformed, standardized, or trimmed as appropriate. The large sample size, in conjunction with the central limit

theorem, helped minimize the impact of residual non-normality (Aflatooni, 2018). To control for cross-sectional heterogeneity, industry-specific structural variables were incorporated into the models. Instead of employing year fixed effects, annual inflation rates were used to capture temporal variation. By embedding these control variables directly into the model structure, the fixed effects of industry and time were effectively absorbed, rendering tests such as the F-Limer (for panel suitability) and Hausman (for model specification) unnecessary.

3.2. Research models

Model for testing the hypotheses

To test the research hypotheses, this study adopts the empirical framework proposed by Greiner et al. (2017), along with extended model specifications tailored to the Iranian research context by Mohammadrezaei and Faraji (2019). Model (1) is used to test the main relationship between REM and audit fees (H1), while Model (2) tests the moderating role of AEM in the REM–audit fee relationship (H2).

Model (1)

$$LNAUDIT\ FEES_{i,t} = \beta_0 + \beta_1 REM_{i,t} + \beta_2 AEM_{i,t} + \beta_3 LNASSETS_{i,t} + \beta_4 \mathrm{INVRECV}_{i,t} + \beta_5 LEV_{i,t} + \beta_6 EBIT_{i,t} + \beta_7 LOSS_{i,t} + \beta_8 AUDITOR\ CHANGE_{i,t} + \beta_9 SUBS_{i,t} + \beta_{10} FRA_{i,t} + \beta_{11} LNDELAY_{i,t} + \beta_{12} LNAGE_{i,t} + \beta_{13} DISTRESS_{i,t} + \beta_{14} CEO\ CHANGES_{i,t} + \beta_{15} AUDIT\ OPINION_{i,t} + \beta_{16} \mathrm{INFLATION}_{i,t} + \beta_{17} \mathrm{DPS}_{i,t} + \beta_{18} \mathrm{AQPNum}_{i,t} + \beta_{19} \mathrm{FCF}_{i,t} + \beta_{20} \mathrm{INS}_{i,t} + \beta_{21} \mathrm{CONOWN}_{i,t} + \beta_{22} \sum IndustryDum_{i,t} + \varepsilon_{i,t}$$

Model (2)

$$LNAUDIT\ FEES_{i,t} = \beta_0 + \beta_1 REM_{i,t} + \beta_2 AEM_{i,t} + \beta_3 (REM * AEM)_{i,t} + \beta_4 LNASSETS_{i,t} + \beta_5 \mathrm{INVRECV}_{i,t} + \beta_6 LEV_{i,t} + \beta_7 EBIT_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 AUDITOR\ CHANGE_{i,t} + \beta_{10} SUBS_{i,t} + \beta_{11} FRA_{i,t} + \beta_{12} LNDELAY_{i,t} + \beta_{13} LNAGE_{i,t} + \beta_{14} DISTRESS_{i,t} + \beta_{15} CEO\ CHANGES_{i,t} + \beta_{16} AUDIT\ OPINION_{i,t} + \beta_{17} \mathrm{INFLATION}_{i,t} + \beta_{18} \mathrm{DPS}_{i,t} + \beta_{19} \mathrm{AQPNum}_{i,t} + \beta_{20} \mathrm{FCF}_{i,t} + \beta_{21} \mathrm{INS}_{i,t} + \beta_{22} \mathrm{CONOWN}_{i,t} + \beta_{23} \sum INDUSTRY\ DUM_{i,t} + \varepsilon_{i,t}$$

3.3. Measurement of variables

3.2.1. Dependent variable

The dependent variable captures the outcome of interest in this study, audit pricing, as determined by external auditors.

LNAUDIT FEES = The natural logarithm of audit fees, which is extracted from the notes to the financial statements of the companies.

3.2.2. Independent variable

The primary independent variable reflects the extent to which firms engage in operational manipulation to manage reported earnings.

REM = REM index for the current year, calculated using the Roychowdhury (2006) model as detailed in Models 3, 4, and 5. To calculate the integrated REM measure, following Cohen and Zarowin (2010) and Zang (2012), the residuals of Models 3, 4, and 5 are summed together. Following their suggestion for simplicity in interpreting the resulting measure, the residuals in Models 3 and 5

are multiplied by -1. The higher this measure for a company, the higher the level of REM.

Primary REM Measurement Models (Roychowdhury, 2006):

Operating Cash Flow Model

Model (3)

$$\frac{CFO_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{SALES_t}{A_{t-1}} + \beta_3 \frac{\Delta SALES_t}{A_{t-1}} + \varepsilon$$

Cost of Goods Sold Model

Model (4)

$$\frac{CGS_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{SALES_t}{A_{t-1}} + \beta_3 \frac{\Delta SALES_t}{A_{t-1}} + \beta_4 \frac{\Delta SALES_{t-1}}{A_{t-1}} + \varepsilon$$

Discretionary Expenses Model

Model (5)

$$\frac{DISE_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{SALES_t}{A_{t-1}} + \varepsilon$$

Where:

CFO = Current year operating cash flow.

1/At−1= Used as a scaling factor to homogenize the model.

SALES = Total sales revenue for the current year.

ΔSALES = Change in sales revenue from the current year compared to the previous year.

CGS = Cost of goods sold for the current year.

ΔSALES (t-1) = Change in sales revenue from the previous year compared to two years ago.

DISE = General, distribution, and selling expenses for the current year.

To calculate the integrated measure of REM, following Cohen and Zarowin (2010) and Zang (2012), the residuals of Models 3, 4, and 5 are summed.

Alternative Approach to Measuring REM

To evaluate the robustness of the main findings, this study employed the discretionary expenses model as specified by Cohen and Zarowin (2010). This model extends the original framework introduced by Roychowdhury (2006). Cohen and Zarowin (2010) highlighted a limitation of the original model, noting that when managers artificially boost sales in a given year, the resulting residuals from the discretionary expense estimation may appear insignificant, thereby masking REM behavior. To overcome this limitation, they proposed incorporating lagged sales into the model, allowing discretionary expenses to be estimated as a function of prior-year sales rather than contemporaneous figures. Following their suggestion for simplicity in interpreting the resulting measure, the residuals in Models 6 and 8 are multiplied by -1. The higher this measure for a company, the higher the level of REM. This alternative specification is used solely for robustness testing and does not replace the primary REM measurement presented earlier. In line with this adjustment, we implemented the revised model to conduct robustness tests and determine whether our primary results hold under an alternative specification of REM. The second method for estimating REM includes the following models:

Operating Cash Flow Model

Model (6)

$$\frac{CFO_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{SALES_t}{A_{t-1}} + \beta_3 \frac{\Delta SALES_t}{A_{t-1}} + \varepsilon$$

Cost of Goods Sold Model

Model (7)

$$\frac{CGS_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{SALES_t}{A_{t-1}} + \beta_3 \frac{\Delta SALES_t}{A_{t-1}} + \beta_4 \frac{\Delta SALES_{t-1}}{A_{t-1}} + \varepsilon$$

Discretionary Expenses Model

Model (8)

$$\frac{DISE_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{SALES_{t-1}}{A_{t-1}} + \varepsilon$$

This model is similar to REM Models (3), (4), and (5), with the difference that in Model (8), sales changes are lagged by one period (i.e., the previous year's sales).

3.2.3. Control variables

Following prior audit pricing literature, a set of control variables is included to account for firm-specific characteristics, governance attributes, and macroeconomic conditions that may influence audit fees.

AEM = The AEM index for the current year, derived through the following models.

In the main analysis, AEM is measured using the Kothari et al. (2005) model; the Jones, Modified Jones, and Kasznik models are employed only in robustness tests to assess the sensitivity of the results to alternative AEM specifications.

All AEM measures retain their original sign to preserve directional information about earnings management.

AEM Models

Jones (*1991*) Model:

$$\frac{TACC_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{\Delta REV_t}{A_{t-1}} + \beta_3 \frac{PPE_t}{A_{t-1}} + \varepsilon$$

Model (9)

Where:

TACC = Total accruals (discretionary accruals).

1/At−1= Used as a scaling factor to homogenize the model.

ΔREV = Change in total revenue for the current year compared to the previous year.

PPE = Property, plant, and equipment.

ε = Model error term, indicating AEM.

To scale the variables, all variables are divided by total assets at the beginning of the period.

Data Arrangement for Residuals Calculation

To compute the residuals for the models, the data should be segmented by industry and year with a cross-sectional structure. Additionally, there must be at least eight companies in each industry.

Modified Jones Model (*Dechow et al., 1995*):

$$\frac{TACC_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{\Delta REV_t - \Delta REC_t}{A_{t-1}} + \beta_3 \frac{PPE_t}{A_{t-1}} + \varepsilon$$

Model (10)

Where:

ΔREC = Change in accounts receivable from the current year compared to the previous year. The remaining variables are the same as in the Jones model.

Kasznik (*1999*) Model:

$$\frac{TACC_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{\Delta REV_t - \Delta REC_t}{A_{t-1}} + \beta_3 \frac{PPE_t}{A_{t-1}} + \beta_4 + \frac{\Delta CFO_t}{A_{t-1}} + \varepsilon$$

Model (11)

Where:

ΔCFO = Change in operating cash flow from the current year compared to the previous year. The remaining variables are the same as in the modified Jones model.

Kothari et al. (*2005*) Model:

$$\frac{TACC_t}{A_{t-1}} = \beta_0 + \beta_1 + \frac{1}{A_{t-1}} + \beta_2 \frac{\Delta REV_t - \Delta REC_t}{A_{t-1}} + \beta_3 \frac{PPE_t}{A_{t-1}} + \beta_4 + ROA_t + \varepsilon$$

Model (12)

Where:

ROA = Return on assets, calculated as net income divided by total assets. The remaining variables are the same as in the Kasznik model.

LNASSETS = The natural logarithm of total assets, representing company size.

INVRECV = The ratio of accounts receivable and inventory to total assets.

LEV = The ratio of total liabilities to total assets.

EBIT = The ratio of earnings before interest and taxes to total assets.

LOSS = A binary variable that takes the value of 1 if the company reported a loss in the current year and 0 otherwise.

AUDITOR CHANGE = A binary variable that takes the value of 1 if the company changed its auditor, and 0 otherwise.

SUBS = A binary variable indicating company complexity, taking the value of 1 if the company has subsidiaries and 0 otherwise (Greiner et al., 2017; Mohammadrezaei and Faraji, 2019).

FRA = First-tier auditors, with a value of 1 if the auditing firm is a first-tier institution trusted by the Securities and Exchange Organization, and 0 otherwise (Mohammadrezaei and Faraji, 2019).

LNDELAY = Audit report delay, calculated as the natural logarithm of the number of days between the end of the fiscal year and the audit report date (Greiner et al., 2017).

LNAGE = The natural logarithm of the company's age, calculated from the founding year to the reporting period (Mohammadrezaei and Faraji, 2019).

DISTRESS = A binary variable indicating bankruptcy, with a value of 1 if the company is bankrupt and 0 if it is not. This indicator is derived using the Z-Score model (Zmijewski, 1984) as follows:

$$Z = -4.3 - 4.5(ROA) + 5.7(FINL) + 0.004(LIQ)$$

Model (13)

Where:

Z = Bankruptcy probability. If $Z < 0.5$, the company is considered non-bankrupt, and if $Z > 0.5$, the company is considered bankrupt.

ROA = Return on assets (net income divided by total assets).

FINL = Total liabilities to total assets ratio.

LIQ = Current assets to current liabilities ratio (current ratio).

AUDIT OPINION = The audit opinion, with a value of 1 if the auditor provides an adverse opinion and 0 otherwise.

CEO CHANGES = A binary variable indicating CEO change, with a value of 1 if the CEO changed, and 0 otherwise.

INFLATION = The annual inflation rate, extracted from the website of the Statistical Center of Iran.

DPS = The amount of dividends paid by the company, standardized by share price.

AQPNum = The number of qualified opinion paragraphs in the auditor's report. (Bani Mahd et al., 2014).

FCF = Free cash flow, calculated as the difference between operating cash flow and net investment in fixed assets. This variable is standardized by total assets.

INS = The percentage of institutional shareholders, derived from the notes accompanying the companies' financial statements.

CONOWN = Ownership concentration, defined as shareholders owning more than 50% of the company's shares. This information is extracted from the notes to the companies' audited financial statements.

INDUSTRYDUM = Industry control variable.

3.3. Moderator variable

To test the core theoretical proposition regarding dual earnings management, we include a moderating variable that captures the interaction between real and accrual-based strategies.

REM × AEM = The interaction between REM and AEM, moderating the relationship between REM and audit fees.

4. Findings and discussion

4.1. Descriptive statistics

Table 2 presents the descriptive statistics of the study variables, summarizing key measures of central tendency, dispersion, and distributional shape, including the mean, median, standard deviation, skewness, and kurtosis.

Tables 2 and 3 present the descriptive statistics for the main variables used in the analysis. The mean value of the natural logarithm of audit fees is 6.949 (median = 6.870), with a standard deviation of 0.908, suggesting moderate dispersion across firms. Both REM and AEM exhibit mean values close to zero, consistent with their residual-based estimation methods. Among the control variables, firm size has an average logarithmic value of 14.032, while inventories and receivables comprise 49.6% of total assets, reflecting substantial investment in working capital. The average leverage ratio is 58.5%, and EBIT accounts for 14.6% of total assets, implying a recovery period of approximately seven years. The mean value of audit delay is 4.267 (logarithmic days), and the average firm age is 3.537. Dividend payout and free cash flow are relatively low, with mean values of 0.076 and 0.079, respectively. On average, firms receive 1.39 audit qualification paragraphs, and institutional investors hold 74.3% of outstanding shares. Ownership concentration averages 53.8%, while the annual inflation rate across the study period averages 25.9%, reflecting substantial macroeconomic volatility. Regarding binary variables, 48.0% of firms receive modified audit opinions, and 68.9% are audited by first-tier audit firms. Additionally, 11.8% of firms report negative earnings, 23.0% operate subsidiaries, 4.9% are classified as financially distressed, 23.2% change their external auditor annually, and 31.6% experience CEO turnover.

Table 2. Descriptive statistics of continuous variables

Symbol	Mean	Median	Maximum	Minimum	Standard deviation	Skewness	Kurtosis
LNAUDIT FEES	6.949	6.870	8.730	5.440	0.908	0.235	2.263
REMCFO	0.000	0.004	0.302	-0.396	0.092	-0.6747	2.559
REMCGS	0.000	0.000	0.335	-0.563	0.083	-0.195	3.152
REMDISE	0.000	0.000	0.088	-0.077	0.024	0.163	2.465
REM1	0.000	0.004	0.662	-0.795	0.156	-0.878	3.011
REM2	0.000	0.004	0.654	-0.807	0.156	-0.912	2.045
AEM_{JONES}	0.000	-0.001	0.318	-0.265	0.078	0.357	2.892
$AEM_{MODIFIED}$ JONES	0.000	0.000	0.336	-0.316	0.082	0.251	3.193
$AEM_{KASZNIK}$	0.000	0.000	0.311	-0.281	0.063	0.195	2.991
$AEM_{KOTHARI}$	0.000	0.000	0.335	-0.324	0.063	0.058	2.456
LNASSETS	14.032	13.920	16.650	11.870	1.246	0.306	2.499
INVRECV	0.496	0.500	0.820	0.130	0.208	-0.136	2.937
LEV	0.585	0.620	0.920	0.170	0.202	-0.351	2.383
EBIT*	0.146	0.120	0.460	-0.080	0.144	0.611	2.686
LNDELAY	4.267	4.330	4.740	3.580	0.364	-0.404	2.866
LNAGE	3.537	3.625	4.090	2.710	0.430	-0.476	2.976
DPS**	0.076	0.060	0.230	0.000	0.076	0.609	2.061
AQPNum	1.390	0.000	15.000	0.000	2.060	0.089	2.815
FCF*	0.079	0.070	0.320	-0.120	0.113	0.372	2.642
INS	0.743	0.780	0.950	0.230	0.186	-0.213	3.003
CONOWN	0.538	0.520	0.880	0.170	0.187	0.017	2.562
INFLATION	0.259	0.276	0.458	0.070	0.129	0.061	3.361

* It has been scaled by total assets.
** It has been scaled by stock price.

Table 3. Descriptive statistics of discrete variables

Symbol	Frequency		Percentage	
	1	0	1	0
AUDIT OPINION	415	449	48.030	51.970
FRA	595	269	68.870	31.130
LOSS	102	762	11.810	88.190
AUDITOR CHANGE	200	664	23.150	76.850
SUBS	199	665	23.030	76.970
DISTRESS	822	42	95.140	4.860
CEO CHANGES	591	273	68.400	31.600

Although formal normality tests such as the Jarque–Bera test were not conducted, this omission is methodologically justified given the large sample size (N = 864). According to the Central Limit Theorem, the sampling distribution of regression estimators approaches normality as sample size increases, even when the underlying variables exhibit non-normality (Aflatooni, 2018). This justifies the use of parametric inference without requiring strict normality of the raw variables.

In addition, Table 2 reports skewness and kurtosis values to assess the distributional shape and normality of the variables. The results showed that most variables exhibit moderate skewness and kurtosis values, generally within acceptable statistical ranges, suggesting that the data are approximately normally distributed. Given the large sample size and the use of robust standard errors, the analytical framework remains both statistically valid and methodologically robust.

4.2. Hypothesis testing results

4.2.1. Hypothesis one test result

Table 4 presents the regression results testing Hypothesis 1, which examines the positive association between REM and audit fees.

Table 4. Regression results for the relationship between REM and audit fees (dependent variable: audit fees)

Symbol	Coefficient	t-Statistic
REM1	0.580**	3.240
$AEM_{KOTHARI}$	0.517**	2.580
LNASSETS	0.605**	20.630
INVRECV	0.360*	2.430
LEV	0.240	1.200
EBIT	0.854**	2.950
LOSS	0.152*	1.780
AUDITOR CHANGE	-0.110*	-1.850
SUBS	-0.080	-0.800
FRA	0.224**	3.780
LNDELAY	0.253**	2.680
LNAGE	0.381**	5.220
DISTRESS	0.053	0.380
CEO CHANGES	-0.068	-1.150
AUDIT OPINION	-0.003	-0.020
INFLATION	-0.364	-1.160
DPS	-2.144**	-5.280
AQPNum	-0.103**	-3.880
FCF	0.263	0.560
INS	0.486**	2.300
CONOWN	-0.193	-1.330
C	-2.634**	-4.880
IND	Controlled	
F-statistic	68.341	
Significance of the F-statistic	0.000	
R-squared	0.630	
Number of Observations	864	

** Significant at the 95% confidence level, * significant at the 90% confidence level

As shown in Table 4, REM exhibits a positive and statistically significant effect on audit fees (coefficient = 0.580; t = 3.24), indicating that auditors charge higher fees when firms engage more in REM activities, consistent with the notion that REM increases audit risk and effort. AEM, measured here as discretionary accruals, also positively influences audit fees (coefficient = 0.517; t = 2.58), supporting its direct role in increasing audit complexity and cost. Firm size (LNASSETS), a key control variable, shows a strong positive association with audit fees (coefficient = 0.605; t = 20.63), reflecting the increased audit scope and resources required for larger firms. The ratio of inventory and receivables to total assets (INVRECV) is positively related to audit fees (coefficient = 0.360; t = 2.43), likely due to the higher inherent risk in verifying these assets. Leverage (LEV) has a positive but not statistically significant effect (coefficient = 0.240; t = 1.20), while the EBIT ratio (EBIT) is positively and significantly associated with audit fees (coefficient = 0.854; t = 2.95), suggesting that more profitable firms might incur higher audit costs. Loss presence (LOSS) also shows a positive and marginally significant impact (coefficient = 0.152; t = 1.78). Auditor change (CHANGE) is negatively and significantly related to audit fees (coefficient = –0.110; t = –1.85), indicating that a recent auditor switch might reduce fees, possibly due to introductory pricing or reduced risk assessments. Other controls, such as first-rank auditor status (FRA), audit report delay (LNDELAY), and firm age (LNAGE), show positive and significant coefficients, reaffirming their role in increasing audit fees. In contrast, dividend per share (DPS) and the number of qualified opinion paragraphs (AQPNum) negatively and significantly affect audit fees, possibly reflecting less perceived audit risk or negotiation pressure on fees. Variables such as subsidiary presence (SUBS), financial distress (DISTRESS), CEO changes, audit opinion, inflation, free cash flow, and ownership concentration do not exhibit statistically significant relationships. The model explains a substantial portion of the

variation in audit fees, with an R-squared of 0.630. The overall model fit is strong, supported by a highly significant F-statistic of 68.341 ($p < 0.001$), confirming the robustness and reliability of the findings.

4.2.2. Hypothesis two test result

The second hypothesis of this study investigates whether AEM moderates the relationship between REM and audit fees. Table 5 reports the regression results for the corresponding model used to test this interaction effect.

Table 5. Regression results for the moderating effect of AEM on the REM–audit fee relationship (dependent variable: audit fees)

Symbol	Coefficient	t-Statistic
REM1	0.572**	3.100
$AEM_{KOTHARI}$	0.308**	2.850
Interaction	-2.640**	-2.820
LNASSETS	0.508**	22.820
INVRECV	0.241*	1.850
LEV	0.264	1.620
EBIT	0.802**	2.840
LOSS	0.154*	1.840
AUDITOR CHANGE	-0.095*	-1.920
SUBS	-0.074	-1.030
FRA	0.207**	4.410
LNDELAY	0.217**	2.630
LNAGE	0.346**	6.170
DISTRESS	0.042	0.350
CEO CHANGES	-0.052	-1.100
AUDIT OPINION	-0.007	-0.090
INFLATION	-0.301	-1.270
DPS	-2.113**	-6.050
AQPNum	-0.098**	-3.810
FCF	0.286	1.040
INS	0.474**	3.180
CONOWN	-0.189	-1.400
C	-2.570**	-4.850
IND	Controlled	
F-statistic	47.400	
Significance of the F-statistic	0.000	
R-squared	0.616	
Number of Observations	864	

** Significant at the 95% confidence level, * significant at the 90% confidence level

As shown in Table 5, the interaction term between REM and AEM, denoted as $REM \times AEM_{KOTHARI}$, is negative and statistically significant at the 95% confidence level (coefficient = –2.640; t = –2.82). This finding indicates that higher levels of AEM weaken the positive association between REM and audit fees, thereby supporting the hypothesis that AEM moderates this relationship. A marginal effect analysis further confirms this moderating pattern. When AEM is at one standard deviation below its mean, the marginal effect of REM on audit fees remains strongly positive and significant. However, as AEM increases to one standard deviation above its mean, this marginal effect diminishes substantially and may become statistically insignificant. This pattern suggests that at high levels of accrual manipulation, auditors focus less on real activity deviations, consistent with a dampening (rather than amplifying) moderation mechanism. Moreover, the coefficient on REM is positive and significant (coefficient = 0.572; $p < 0.05$), suggesting that auditors increase their fees in response to heightened REM activity, consistent with the view that REM increases audit risk. AEM, as measured by the Kothari model, also exhibits a positive and statistically

significant effect on audit fees (coefficient = 0.308), confirming its direct role in driving increases in audit costs. Among the control variables, firm size, EBIT, firm age, and the presence of a first-tier auditor are all positively associated with audit fees, aligning with prior literature that links these factors to increased audit effort and complexity. In contrast, dividend per share and the number of audit qualification paragraphs show negative and significant relationships with audit fees, potentially reflecting reduced audit risk or downward pressure on audit pricing. The model's explanatory power is robust, as indicated by an R-squared value of 0.616. The F-statistic of 47.400 ($p < 0.001$) further confirms the model's overall significance and reliability.

4.3. Robustness tests of the research hypothesis

4.3.1. First robustness test

To evaluate the robustness of the research hypothesis, a series of sensitivity analyses was performed using four alternative models for measuring AEM. In these robustness tests, REM was consistently estimated using operating cash flows, while AEM was calculated based on the Jones, Modified Jones, Kasznik, and Kothari models. The results of these analyses are summarized in Tables 6 to 10.

Table 6. Robustness test results using operating cash flows to estimate REM (dependent variable: audit fees)

Symbol	AEM_JONES	AEM_MODIFIED JONES	AEM_KASZNIK	AEM_KOTHARI
REMCFO	1.181** (3.770)	1.181** (3.840)	1.035** (3.540)	1.175** (3.670)
AEMJONES	0.671** (2.100)	-	-	-
AEMMODIFIED JONES	-	0.722** (2.400)	-	-
AEMKASZNIK	-	-	0.724** (2.140)	-
AEMKOTHARI	-	-	-	0.655* (1.710)
REMCFO*AEMJONES	-0.725 (-0.430)	-	-	-
REMCFO*AEMMODIFIED JONES	-	0.247 (0.150)	-	-
REMCFO*AEMKASZNIK	-	-	-0.528 (-0.220)	-
REMCFO*AEMKOTHARI	-	-		-2.731** (-2.390)
LNASSETS	0.507** (22.880)	0.506** (22.750)	0.506** (22.860)	0.51** (22.920)
INVRECV	0.235* (1.800)	0.237* (1.810)	0.251* (1.930)	0.228* (1.740)
LEV	0.239 (1.440)	0.242 (1.480)	0.258 (1.570)	0.291* (1.790)
EBIT	0.788** (2.750)	0.826** (2.850)	0.779** (2.730)	0.739** (2.670)
LOSS	0.141* (1.680)	0.145* (1.720)	0.149* (1.750)	0.146* (1.760)
AUDITOR CHANGE	-0.093* (-1.880)	-0.09* (-1.820)	-0.095* (-1.910)	-0.094* (-1.900)
SUBS	-0.070 (-0.980)	-0.066 (-0.920)	-0.061 (-0.860)	-0.077 (-1.080)
FRA	0.214** (4.610)	0.217** (4.660)	0.217** (4.680)	0.215** (4.610)
LNDELAY	0.226** (2.770)	0.227** (2.790)	0.228** (2.800)	0.214** (2.610)
LNAGE	0.331** (5.910)	0.326** (5.850)	0.337** (5.980)	0.336** (5.960)
DISTRESS	0.047 (0.390)	0.053 (0.440)	0.058 (0.470)	0.040 (0.330)
CEO CHANGE	-0.056 (-1.190)	-0.051 (-1.070)	-0.051 (-1.090)	-0.050 (-1.050)
AUDIT OPINION	0.001 (0.010)	-0.002 (-0.030)	0.001 (0.010)	-0.009 (-0.120)
INFLATION	-0.313 (-1.310)	-0.332 (-1.390)	-0.309 (-1.300)	-0.287 (-1.210)
DPS	-2.152** (-6.200)	-2.156** (-6.190)	-2.163** (-6.190)	-2.144** (-6.110)
AQPNum	-0.101** (-3.880)	-0.1** (-3.890)	-0.101** (-3.920)	-0.098** (-3.790)
FCF	0.379 (1.330)	0.352 (1.210)	0.436 (1.510)	0.443 (1.550)
INS	0.434** (2.910)	0.439** (2.960)	0.429** (2.860)	0.429** (2.900)
CONOWN	-0.191 (-1.420)	-0.189 (-1.400)	-0.175 (-1.290)	-0.178 (-1.310)
C	-2.518** (-4.780)	-2.52** (-4.800)	-2.568** (-4.840)	-2.535** (-4.760)
IND	Controlled	Controlled	Controlled	Controlled
F-statistic	46.610	46.600	46.980	47.860
Significance of the F-statistic	0.000	0.000	0.000	0.000
R-squared	0.616	0.617	0.616	0.616
Number of Observations	864	864	864	864

Table 7. Robustness test results using cost of goods sold to estimate REM (dependent variable: audit fees)

Symbol	AEM_JONES	AEM_MODIFIED JONES	AEM_KASZNIK	AEM_KOTHARI
REMCGS	0.881** (2.400)	0.846** (2.390)	0.789** (2.150)	0.888** (2.670)
AEMJONES	**0.019 (2.060)		-	-
AEMMODIFIED JONES	-	0.166** (2.540)	-	-
AEMKASZNIK	-	-	0.305** (2.810)	-
AEMKOTHARI	-	-	-	0.012** (2.030)
REMCGS*AEMJONES	0.357 (0.190)	-	-	-
REMCGS*AEMMODIFIED JONES	-	0.371 (0.170)	-	-
REMCGS*AEMKASZNIK	-	-	1.325 (0.680)	-
REMCGS*AEMKOTHARI	-	-		-6.798** (-2.070)
LNASSETS	0.504** (22.730)	0.504** (22.760)	0.504** (22.710)	0.507** (22.740)
INVRECV	0.281** (2.200)	0.283** (2.210)	0.287** (2.230)	0.264** (2.050)
LEV	0.215 (1.300)	0.207 (1.260)	0.203 (1.220)	0.215 (1.310)
EBIT	0.752** (2.630)	0.776** (2.700)	0.782** (2.730)	0.784** (2.760)
LOSS	0.154* (1.830)	0.152* (1.810)	0.155* (1.840)	0.163* (1.930)
AUDITOR CHANGE	-0.093* (-1.880)	-0.092* (-1.850)	-0.091* (-1.840)	-0.097* (-1.960)
SUBS	-0.049 (-0.690)	-0.048 (-0.670)	-0.044 (-0.620)	-0.065 (-0.900)
FRA	0.217** (4.650)	0.217** (4.610)	0.217** (4.630)	0.208** (4.450)
LNDELAY	0.216** (2.620)	0.216** (2.620)	0.22** (2.670)	0.217** (2.650)
LNAGE	0.34** (6.050)	0.337** (6.030)	0.339** (6.040)	0.342** (6.120)
DISTRESS	0.037 (0.300)	0.041 (0.340)	0.039 (0.320)	0.056 (0.470)
CEO CHANGES	-0.055 (-1.170)	-0.054 (-1.140)	-0.054 (-1.150)	-0.053 (-1.130)
AUDIT OPINION	0.003 (0.040)	0.002 (0.020)	0.004 (0.060)	-0.005 (-0.060)
INFLATION	-0.287 (-1.210)	-0.295 (-1.240)	-0.292 (-1.230)	-0.308 (-1.300)
DPS	-2.108** (-6.120)	-2.086** (-6.080)	-2.088** (-6.120)	-2.1** (-6.170)
AQPNum	-0.102** (-3.940)	-0.102** (-3.960)	-0.104** (-4.010)	-0.1** (-3.870)
FCF	0.144 (0.530)	0.067 (0.240)	0.071 (0.290)	0.117 (0.450)
INS	0.473** (3.140)	0.468** (3.110)	0.465** (3.080)	0.487** (3.270)
CONOWN	-0.180 (-1.330)	-0.178 (-1.330)	-0.173 (-1.290)	-0.184 (-1.380)
C	-2.487** (-4.740)	-2.476** (-4.730)	-2.493** (-4.750)	-2.538** (-4.860)
IND	Controlled	Controlled	Controlled	Controlled
F-statistic	47.270	47.330	47.290	48.180
Significance of the F-statistic	0.000	0.000	0.000	0.000
R-squared	0.613	0.614	0.614	0.616
Number of Observations	864	864	864	864

Table 8. Robustness test results using discretionary expenses to estimate REM (dependent variable: audit fees)

Symbol	AEM_JONES	AEM_MODIFIED JONES	AEM_KASZNIK	AEM_KOTHARI
REMDISE	1.412** (2.530)	1.428** (2.560)	1.387** (2.520)	1.515** (2.640)
AEMJONES	0.241** (2.800)	-	-	-
AEMMODIFIED JONES	-	0.340** (2.180)	-	-
AEMKASZNIK	-	-	0.577** (2.720)	-
AEMKOTHARI	-	-	-	0.029** (2.080)
REMDISE*AEMJONES	-7.228 (-0.660)	-	-	-
REMDISE*AEMMODIFIED JONES	-	-14.110 (-1.480)	-	-
REMDISE*AEMKASZNIK	-	-	-12.865 (-1.230)	-
REMDISE*AEMKOTHARI	-	-	-	-19.704** (-2.650)
LNASSETS	0.509** (23.020)	0.509** (23.040)	0.508** (23.040)	0.51** (23.080)
INVRECV	0.328** (2.560)	0.322** (2.510)	0.325** (2.550)	0.316** (2.490)
LEV	0.228 (1.380)	0.226 (1.390)	0.224 (1.380)	0.223 (1.380)
EBIT	0.540* (1.910)	0.564** (1.990)	0.582** (2.060)	0.486* (1.760)
LOSS	0.135 (1.600)	0.132 (1.570)	0.138 (1.620)	0.129 (1.530)
AUDITOR CHANGE	-0.1** (-2.020)	-0.099** (-2.000)	-0.1** (-2.020)	-0.1** (-2.020)
SUBS	-0.047 (-0.650)	-0.047 (-0.650)	-0.042 (-0.580)	-0.045 (-0.630)
FRA	0.225** (4.850)	0.227** (4.880)	0.223** (4.790)	0.23** (4.940)
LNDELAY	0.211** (2.570)	0.206** (2.520)	0.206** (2.520)	0.205** (2.490)
LNAGE	0.315** (5.430)	0.312** (5.410)	0.319** (5.530)	0.32** (5.520)
DISTRESS	0.050 (0.440)	0.064 (0.560)	0.072 (0.600)	0.035 (0.310)
CEO CHANGES	-0.048 (-1.010)	-0.044 (-0.940)	-0.046 (-0.980)	-0.050 (-1.060)
AUDIT OPINION	0.003 (0.040)	0.001 (0.010)	0.002 (0.020)	0.002 (0.020)
INFLATION	-0.220 (-0.930)	-0.231 (-0.970)	-0.226 (-0.950)	-0.219 (-0.930)
DPS	-2.001** (-5.880)	-2.003** (-5.870)	-2.003** (-5.880)	-2.1** (-6.170)
AQPNum	-0.107** (-4.090)	-0.106** (-4.060)	-0.107** (-4.080)	-0.105** (-4.020)
FCF	-0.042 (-0.160)	-0.074 (-0.280)	-0.042 (-0.170)	0.046 (0.180)
INS	0.389** (2.640)	0.383** (2.620)	0.382** (2.610)	0.386** (2.620)
CONOWN	-0.156 (-1.330)	-0.150 (-1.120)	-0.148 (-1.090)	-0.139 (-1.010)
C	-2.4** (-4.570)	-2.389** (-4.560)	-2.405** (-4.550)	-2.384** (-4.520)
IND	Controlled	Controlled	Controlled	Controlled
F-statistic	50.560	51.020	51.220	50.330
Significance of the F-statistic	0.000	0.000	0.000	0.000
R-squared	0.610	0.611	0.612	0.611
Number of Observations	864	864	864	864

Table 9. Robustness test results using composite REM (dependent variable: audit fees)

Symbol	AEM$_{JONES}$	AEM$_{MODIFIED\ JONES}$	AEM$_{KASZNIK}$	AEM$_{KOTHARI}$
REM1	0.554** (3.060)	0.559** (3.090)	0.521** (2.840)	0.572** (3.100)
AEMJONES	0.298** (2.050)			
AEMMODIFIED JONES		0.414** (2.440)		
AEMKASZNIK			0.482** (2.390)	
AEMKOTHARI				0.308** (2.850)
REM*AEMJONES	-0.177 (-0.170)			
REM*AEMMODIFIED JONES		0.269 (0.240)		
REM*AEMKASZNIK			0.477 (0.390)	
REM*AEMKOTHARI				-2.64** (-2.820)
LNASSETS	0.505** (22.840)	0.504** (22.750)	0.503** (22.770)	0.508** (22.820)
INVRECV	0.258** (1.990)	0.259** (2.000)	0.266** (2.050)	0.241* (1.850)
LEV	0.232 (1.400)	0.226 (1.390)	0.230 (1.400)	0.264 (1.620)
EBIT	0.797** (2.750)	0.832** (2.850)	0.816** (2.820)	0.802** (2.840)
LOSS	0.148* (1.760)	0.149* (1.780)	0.154* (1.820)	0.154* (1.840)
AUDITOR CHANGE	-0.092* (-1.850)	-0.09* (-1.810)	-0.091* (-1.830)	-0.095* (-1.920)
SUBS	-0.061 (-0.850)	-0.057 (-0.800)	-0.054 (-0.770)	-0.074 (-1.030)
FRA	0.214** (4.570)	0.215** (4.580)	0.215** (4.590)	0.207** (4.410)
LNDELAY	0.225** (2.720)	0.226** (2.740)	0.229** (2.780)	0.217** (2.630)
LNAGE	0.343** (6.120)	0.34** (6.070)	0.345** (6.130)	0.346** (6.170)
DISTRESS	0.037 (0.310)	0.041 (0.340)	0.043 (0.350)	0.042 (0.350)
CEO CHANGES	-0.057 (-1.200)	-0.054 (-1.140)	-0.055 (-1.160)	-0.052 (-1.100)
AUDIT OPINION	0.002 (0.020)	0.000 (0.000)	0.003 (0.040)	-0.007 (-0.090)
INFLATION	-0.311 (-1.300)	-0.324 (-1.360)	-0.315 (-1.320)	-0.301 (-1.270)
DPS	-2.145** (-6.190)	-2.138** (-6.160)	-2.154** (-6.210)	-2.113** (-6.050)
AQPNum	-0.10** (-3.860)	-0.101** (-3.900)	-0.102** (-3.930)	-0.098** (-3.810)
FCF	0.264 (0.940)	0.218 (0.760)	0.276 (1.010)	0.286 (1.040)
INS	0.472** (3.150)	0.473** (3.160)	0.469** (3.110)	0.474** (3.180)
CONOWN	-0.189 (-1.400)	-0.188 (-1.400)	-0.181 (-1.340)	-0.189 (-1.400)
C	-2.54** (-4.810)	-2.535** (-4.820)	-2.405** (-4.550)	-2.384** (-4.520)
IND	Controlled	Controlled	Controlled	Controlled
F-statistic	50.560	51.020	51.220	50.330
Significance of the F-statistic	0.000	0.000	0.000	0.000
R-squared	0.610	0.611	0.612	0.611
Number of Observations	864	864	864	864

Table 10. Robustness test results using the alternative REM model based on lagged sales (dependent variable: audit fees)

Symbol	AEMJONES	AEMMODIFIED JONES	AEMKASZNIK	AEMKOTHARI
REM2	0.531** (2.890)	0.534** (2.920)	0.495** (2.660)	0.548** (2.940)
AEM_JONES	0.296** (2.010)			
AEMMODIFIED JONES		0.405** (2.410)		
AEMKASZNIK			0.480** (2.390)	
AEMKOTHARI				0.295** (2.810)
REM2*AEMJONES	-0.177 (-0.180)			
REM2*AEMMODIFIED JONES		0.235 (0.210)		
REM2*AEMKASZNIK			0.494 (0.400)	
REM2*AEMKOTHARI				-2.753** (-2.860)
LNASSETS	0.505** (22.850)	0.504** (22.760)	0.504** (22.770)	0.508** (22.820)
INVRECV	0.258** (2.000)	0.260** (2.000)	0.267** (2.060)	0.241* (1.850)

LEV	0.236 (1.420)	0.231 (1.410)	0.234 (1.420)	0.269* (1.660)
EBIT	0.793** (2.740)	0.826** (2.830)	0.811** (2.800)	0.799** (2.820)
LOSS	0.147* (1.760)	0.149* (1.770)	0.153* (1.810)	0.153* (1.840)
AUDITOR CHANGE	-0.093* (-1.880)	-0.091* (-1.830)	-0.092* (-1.850)	-0.097* (-1.950)
SUBS	-0.060 (-0.850)	-0.057 (-0.800)	-0.054 (-0.760)	-0.074 (-1.030)
FRA	0.213** (4.560)	0.214** (4.570)	0.214** (4.580)	0.206** (4.390)
LNDELAY	0.224** (2.710)	0.226** (2.730)	0.229** (2.770)	0.217** (2.630)
LNAGE	0.343** (6.110)	0.34** (6.070)	0.345** (6.120)	0.346** (6.160)
DISTRESS	0.037 (0.300)	0.040 (0.330)	0.043 (0.350)	0.041 (0.340)
CEO CHANGES	-0.056 (-1.180)	-0.053 (-1.120)	-0.054 (-1.140)	-0.051 (-1.080)
AUDIT OPINION	0.003 (0.030)	0.001 (0.010)	0.004 (0.050)	-0.005 (-0.070)
INFLATION	-0.309 (-1.290)	-0.321 (-1.340)	-0.312 (-1.310)	-0.300 (-1.260)
DPS	-2.137** (-6.170)	-2.130** (-6.130)	-2.146** (-6.180)	-2.103** (-6.010)
AQPNum	-0.101** (-3.880)	-0.101** (-3.910)	-0.102** (-3.950)	-0.099** (-3.830)
FCF	0.254 (0.940)	0.210 (0.730)	0.264 (0.960)	0.279 (1.020)
INS	0.470** (3.130)	0.470** (3.140)	0.466** (3.090)	0.471** (3.160)
CONOWN	-0.188 (-1.390)	-0.186 (-1.380)	-0.179 (-1.330)	-0.188 (-1.400)
C	-2.542** (-4.820)	-2.537** (-4.820)	-2.568** (-4.850)	-2.574** (-4.860)
IND	Controlled	Controlled	Controlled	Controlled
F-statistic	46.550	46.390	46.600	47.540
Significance of the F-statistic	0.000	0.000	0.000	0.000
R-squared	0.614	0.615	0.615	0.616
Number of Observations	864	864	864	864

Note: Each cell presents the coefficient followed by its t-statistic in parentheses.
Statistical significance is indicated as follows:
** Significant at the 95% confidence level, * significant at the 90% confidence level

Robustness tests employing five alternative specifications of REM, operating cash flow (Table 6), cost of goods sold (Table 7), discretionary expenses (Table 8), composite REM model (Table 9), and the alternative REM model based on lagged sales (Table 10), consistently reinforce the study's primary findings. Across all models, REM maintains a positive and statistically significant association with audit fees, indicating that auditors perceive it as a major risk factor that necessitates increased audit effort. Similarly, AEM, measured using the Jones, Modified Jones, Kasznik, and Kothari models, exhibits a consistently positive and significant effect on audit fees, suggesting its independent contribution to perceived audit risk and cost. Notably, a significant negative interaction between REM and AEM is observed only when AEM is measured using the Kothari model. This finding implies that AEM, when estimated with higher precision, attenuates the positive relationship between REM and audit fees. No such moderating effect emerges under the Jones-type models, emphasizing the critical role of model selection in detecting dual earnings management interactions. Among the control variables, firm size, profitability (EBIT), firm age, audit delay, affiliation with a top-tier auditor, and institutional ownership all show robust positive effects on audit fees, consistent with expectations regarding audit complexity and risk. In contrast, dividend per share, auditor change, and the number of audit qualification paragraphs are negatively associated with audit fees, possibly reflecting lower perceived risk or pricing pressure. Other variables, including CEO turnover, financial distress, free cash flow, and ownership concentration, do not exhibit a statistically significant relationship with audit fees. Collectively, these robustness checks confirm the stability of the main results and underscore the importance of model precision in dual earnings management research.

5. Discussion

This study investigated whether AEM moderates the relationship between REM and audit fees. Regarding H1, the coefficient of REM (0.580, t = 3.24) reported in Table 4 indicates a positive and statistically significant relationship between REM and audit fees. This result suggests that auditors

interpret higher levels of REM as a signal of increased audit risk, prompting additional audit effort and consequently higher fees. Firms engaging more intensively in operational manipulation thus face greater monitoring costs. This finding is consistent with the predictions of agency theory (Meckling and Jensen, 1976) and aligns with empirical evidence provided by Choi et al. (2018), Greiner et al. (2017), and Moradi et al. (2019), which collectively confirm that auditors incorporate the risk implications of REM into their pricing decisions. The interaction coefficient of –2.640 (t = –2.82) suggests that when firms simultaneously engage in both REM and AEM, commonly referred to as dual earnings management, the positive association between REM and audit fees weakens. This attenuation may result from auditors' diminished ability to isolate the primary source of reporting risk, thereby reducing the incremental effect of REM on audit pricing. This finding provides empirical support for the moderating role of AEM, which aligns with signaling theory (Spence, 1978) and posits that AEM may divert auditor attention away from operational manipulation due to its adverse informational signals. The result is consistent with prior studies by Alhadab (2018), who found that greater AEM intensity reduces auditors' sensitivity to REM, likely because accrual manipulation is perceived as a more prominent risk factor. Nevertheless, REM independently maintains a positive and statistically significant relationship with audit fees (coefficient = 0.572; t = 3.10), reinforcing the notion that auditors associate REM with elevated audit risk that necessitates increased effort and compensation. This outcome supports the predictions of agency theory (Meckling and Jensen, 1976) and aligns with the findings of Choi et al. (2018) and Greiner et al. (2017). In addition, AEM, measured using the Kothari model, demonstrates a positive and significant effect on audit fees (coefficient = 0.308), further substantiating the relevance of both signaling theory and information asymmetry theory (Scott, 2015; Spence, 1978). Manipulated accruals may serve as red flags to auditors, prompting greater scrutiny and higher audit costs. This result echoes the findings of Abbott et al. (2006) and Yu (2020), who also observed a risk premium associated with aggressive AEM. Notably, among the four accrual models employed, only the Kothari specification produced a statistically significant interaction with REM. By incorporating return on assets as a control variable, the Kothari model adjusts for performance-related distortions, yielding more accurate estimates of abnormal accruals (Kothari et al., 2005). Across all model specifications, the interaction term's t-statistic exceeded the 1.96 threshold only under the Kothari model. In contrast, the Jones, Modified Jones, and Kasznik models produced either weaker or insignificant results. While this does not imply the universal superiority of the Kothari model, the findings underscore its relatively greater explanatory power and sensitivity in detecting the interaction effects inherent in dual earnings management contexts.

From a practical perspective, the results are particularly relevant for auditors, regulators, and corporate governance bodies. Auditors are encouraged to develop more nuanced risk assessment procedures that account for the interplay between REM and AEM, especially in environments with limited transparency and high agency costs. Regulators may also consider developing guidelines that enhance disclosure related to both real and AEM activities, thereby equipping stakeholders with better tools to evaluate reporting integrity. Corporate boards and audit committees should also be vigilant in monitoring managerial decisions that might elevate informational risk and affect the reliability of financial statements.

These findings have several theoretical implications. First, they advance the current understanding of audit pricing by integrating the dual dimensions of earnings management, accrual-based and real, and highlighting their interactive effects. Unlike prior studies that analyze these constructs in isolation, this research offers a more comprehensive understanding of how simultaneous engagement in both types of earnings management influences auditors' pricing strategies. By demonstrating that the moderating effect of AEM is model-sensitive and only significant under the Kothari specification,

this study contributes to ongoing methodological discussions in the literature on earnings management and audit risk.

Although Hypothesis 2 was formulated in a non-directional form to accommodate theoretical ambiguity in the literature, the empirical evidence demonstrates that the moderating effect of AEM is negative, indicating that higher levels of accrual-based earnings management attenuate the positive relationship between REM and audit fees. This finding clarifies the direction of the moderating mechanism proposed in the theoretical framework and aligns with the behavioral perspective, suggesting that auditors' attention may shift toward accrual anomalies when both forms of earnings management coexist.

6. Conclusion

This study examined the moderating effect of AEM on the relationship between REM and audit fees. First, consistent with Hypothesis 1 and the results reported in Table 4, REM exerts a positive and statistically significant effect on audit fees ($\beta = 0.580$, $t = 3.24$), confirming that auditors independently price REM as a distinct source of audit risk. Second, in line with H2, the negative coefficient of the interaction term (–2.640) indicates that AEM weakens this positive relationship. Together, these results highlight auditors' nuanced assessment of dual earnings management, while REM heightens perceived audit risk, concurrent AEM activity partially offsets the incremental pricing effect by complicating auditors' evaluation of overall reporting risk. Using a comprehensive dataset from firms listed on the Tehran Stock Exchange and employing multiple accrual models, the results revealed that REM significantly increases audit fees, indicating that auditors are sensitive to real manipulation practices. The concurrent application of real and AEM, referred to as dual earnings management, creates multifaceted risks that complicate auditors' efforts to evaluate the credibility and transparency of financial reports. Furthermore, AEM was found to moderate this relationship, but only under the Kothari specification, highlighting the model's sensitivity to this effect. These findings extend the audit pricing literature by providing a dual-dimensional perspective on earnings management and its implications for audit risk assessment. The study also emphasizes the importance of considering interaction effects between different forms of earnings management when evaluating the determinants of audit fees. Like all empirical research, this study has limitations. First, it excludes firms without audit fee disclosures and those in specific industries, which may limit the generalizability of the results. Second, the reliance on archival data restricts the ability to capture managerial intent behind earnings management. Future research could explore alternative proxies for earnings manipulation, employ interviews or surveys to gain deeper insights, or examine other emerging markets to validate the findings across institutional contexts.

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