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Abnormal Audit Profits or Costs and Factors Affecting Audit Fees

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Abstract Audit fees are considered important issues for the client and the auditors and a critical component of corporate governance in business environment. Abnormal audit profits or costs can signal underlying issues in audit quality, auditor independence, or financial health of the audited entity. Understanding the factors that affect audit fees is essential for stakeholders to ensure transparency and assurance in financial reporting. Effective communication between auditors and clients is crucial in addressing these issues and ensuring accurate and reliable audit outcomes. The present study examined the relationship between abnormal audit profits or costs and factors influencing audit fees. The research sample comprised 139 companies (695 firm-years) listed on the Tehran Stock Exchange (TSE) during 2016–2020. This period was selected due to significant regulatory changes and economic events that impacted audit practices and fee structures. A multiple regression model was employed to test the research hypotheses. The results showed that abnormal audit profits or costs significantly affect audit quality, Type I audit error, and audit report lag. On the other hand, abnormal audit profits or costs hurt Type II audit errors. The findings suggested that higher audit fees in Iran are more likely to represent the actual costs of conducting audits rather than excess profits. Consequently, higher audit fees lead to increased audit production costs (APC) and improved audit quality.

Keywords: *Abnormal audit profits or costs, Audit fees, Audit quality, Audit errors, Audit report lag*

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1. Introduction

The audit profession's survival and prosperity depend on an appropriate and timely response to social expectations. The audit profession can meet society's needs by taking on more responsibilities, expanding its role, or improving public education about the audit's role and limitations. Furthermore, auditors must take on more responsibilities as users' informational needs grow (Kumari & Ajward, 2023). Effective communication between auditors and stakeholders is essential to address these evolving expectations and ensure transparency. Additionally, leveraging technology can enhance the efficiency and accuracy of audit processes. In recent years, significant changes in the business and the regulatory environment

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of audits in many countries have been observed. These changes, combined with the global economic crisis of the early 1990s, caused a massive rise in competition in the audit market. In the Iranian Association of Certified Public Accountants (IACPA) in 2001, the Iranian audit market experienced a considerable increase in the number of audit firms authorized to provide audit services in the private sector (Rajabalizadeh, 2023).

Therefore, pricing audit services or determining audit fees is of primary importance. Researchers such as Simunic (1980), Doogar et al. (2015), Hribar et al. (2014), and Choi et al. (2010) have shown interest in pricing audit services, and numerous studies have been conducted on this topic. The primary purpose of these studies is to identify factors affecting audit fees since they benefit auditors and auditees; auditees can reduce their costs by negotiating and discounting the audit fee and controlling these factors within their organization, and auditors can appropriately price their services.

Simunic (1980) proposed the first audit fee estimation model. Following Simunic (1980), Doogar et al. (2015) presented a model for calculating the audit fee residuals (APC). Abnormal audit profits or costs (hereafter APC) are extensively used in accounting research. Generally, APC is the error term from audit fee models (audit fee residuals) (Doogar et al., 2015; Yuan et al., 2025). Some researchers (e.g., Choi et al., 2010; Doogar et al., 2015; Hribar et al., 2014) view APC as a combination of auditor rents and noise (i.e., abnormal profits). In contrast, the other view is that audit fee residuals combine unobserved audit production costs and noise (DeAngelo, 1981; Simunic, 1980). The time and workforce required for conducting an audit affect the estimation of audit fees. Several factors affect the time needed to complete an audit engagement. The time required to complete an audit engagement is affected by several factors. To determine audit fees, first, their determinants should be identified, and then, the extent to which they affect the importance and complexity of audit procedures should be measured.

As a result, APC depends on the various factors investigated in this study by presenting a model. Audit quality is one factor that influences audit fees. Higher audit quality signifies the longer hours the auditor has spent on auditing (Asthana & Boone, 2012). In other words, increased fees indicate improved audit quality. Audit hours are one of the determinants of audit fees.

High audit quality denotes that the auditor can meet the users' expectations to a degree because the users of financial statements seek the highest audit quality. Building on existing literature regarding audit quality and its determinants and studies exploring the link between audit quality and audit fees, this research aims to investigate the relationship between APC and audit quality. Additionally, the study examines the connection between abnormal audit fees and audit errors, grounded in the theoretical framework discussed. Furthermore, based on prior research findings, it seeks to determine whether there is a significant relationship between abnormal audit fees and audit report lag. Drawing upon the aforementioned theoretical framework, the hypotheses proposed in this study are as follows:

- Hypothesis 1: A significant relationship exists between abnormal audit profits or costs and audit quality.
- Hypothesis 2: A significant relationship exists between abnormal audit profits or costs and Type I audit error.
- Hypothesis 3: A significant relationship exists between abnormal audit profits or costs and Type II audit error.
- Hypothesis 4: A significant relationship exists between abnormal audit profits, costs, and audit report lag.

2. Theoretical Framework

2.1. Abnormal Audit Fees and Audit Quality

In the auditing literature, many researchers have investigated abnormal audit fees (e.g., Jafaripour et al., 2025). Some scholars (e.g., Choi et al., 2010) view abnormal audit fees as a combination of noise and auditor rents (i.e., abnormal profits), while others (e.g., Hribar et al., 2014) consider them a combination of unobserved audit production costs and noise. Abnormal fees may threaten an auditor's independence; as a result, there may be a negative correlation between abnormal audit fees and auditor independence.

In contrast, abnormal audit fees may indicate the auditor's excessive efforts or the auditor's assessment of (unobserved) audit risk characteristics (Francis, 2011; Hribar et al., 2014). Cost-centric interpretation suggests regulatory abstention because the market drives auditors to spend more effort on auditees with low-quality financial reports, because they must spend longer hours gathering information. If it costs auditors a lot to obtain more information, they may issue audit reports of lower quality (Hribar et al., 2014).

In recent decades, Accruals-based Performance Measures (APC) have become prevalent as an alternative to auditor rents. Remarkable research, such as Srinidhi and Gul (2007), finds no systematic relationship between APC (a measure of earnings quality) and earnings quality. Hope and Langli (2010) found no correlation between high APC (positive) and auditors' tendency to issue going-concern opinions for Norwegian firms. Choi et al. (2010) indicate a direct relationship between upbeat APC and higher abnormal accruals (lower financial reporting quality). Furthermore, Hribar et al. (2014) suggest that APC indicates the extra efforts of the auditor or the risk premium charged by the auditor when the auditee has low-quality accounting. Ball et al. (2012) argue that a high APC reflects the auditee's greater demand for verifying its financial statements and suggest that voluntary disclosures by auditees with more significant fee residuals are of greater accuracy and reliability to investors. Generally, research using private data reports various nonpublic determinants of audit labor usage, like the number of client business locations, the number of audit reports issued, and the auditors' perceived business risk. These determinants reveal the audit fee drivers that researchers did not observe and were omitted from the estimation model (Ball et al., 2012).

Kinney Jr. and Libby (2000) suggest a relationship between abnormal fees and attempted bribes. They argue that favorable abnormal audit fees are negatively related to audit quality. That is, when actual audit fees are higher than regular audit fees, audit quality is lower since favorable abnormal audit fees may motivate the auditor to bow to pressure from the auditee and compromise on audit quality. However, the relationship between opposing abnormal audit fees and audit quality is insignificant or ambiguous because auditors do not have many incentives to impair audit quality.

2.2. Abnormal Fees and Audit Errors

External auditors play a vital role in assessing financial statements and assuring the users of financial statements, especially investors. They consider audit risk when planning and conducting an audit of financial statements. Audit risk arises when the auditor expresses an inappropriate opinion regarding materially misstated financial statements. Audit risk consists of four components: the risks of material misstatement, inherent risk, control risk, and detection risk (Yilu et al., 2017). Auditors should design and perform appropriate risk assessment procedures to identify and assess the risks of material misstatement and restrict audit risk to an acceptable level. Identifying factors affecting audit risk is of primary importance in controlling audit risk.

Audit quality is a key factor in managing audit risk. High-quality audits can significantly reduce audit risk, enhancing the auditor's ability to detect and report misstatements in the auditee's financial statements. The auditor is concerned only with the risks likely to impact financial statements; that is, the auditor gathers appropriate audit evidence to obtain reasonable assurance that financial statements taken as a whole, in all material respects, are by accounting standards. The auditor always encounters some errors, which are classified into two types: Alpha risk (incorrect rejection), which arises when a sample supports the conclusion that there is a risk of material misstatement when there is no material misstatement; this type of risk can negatively affect audit efficiency. Beta risk (incorrect acceptance) occurs when a sample supports the conclusion that there is no material misstatement, but this is not the case. This risk impacts audit effectiveness and is more important than the first type of audit risk.

Auditors may express an inappropriate opinion if they fail to detect material misstatements in financial statements, whether due to fraud or error. Therefore, financial restatements can undermine the credibility of auditors (Hassas Yeganeh & Gholamzadeh Ladari, 2012; Kordestani et al., 2010). Suppose the prior period's financial statements undergo restatement and the auditor does not modify the audit report. In that case, the second type of audit error (the risk of incorrect acceptance) may occur. Various factors influence the occurrence of Type I and Type II audit errors, but the auditor's role is

undeniable. For example, if the auditor does not spend enough time on an audit, the risk that material misstatements in financial statements are not detected will increase and lead to the restatement of financial statements; that is, the risk of incorrect acceptance occurs (Mohammad Rezaei et al., 2018; Noravesh et al., 2017).

There are two conflicting views on the effect of auditor tenure on audit errors and, thus, audit quality. One view is that the long auditor-client relationship can negatively affect auditor independence, leading to an increase in audit errors. The other view is that long tenure increases the auditor's firm-specific knowledge, reducing financial restatements and audit errors (Ghosh & Moon, 2005). Stanley and DeZoort (2007) find that longer auditor tenure minimizes the likelihood of financial statements being restated. Choi et al. (2010) examine the effect of auditor characteristics on the auditor's opinion and suggest that auditor experience and industry expertise reduce the error in the auditor's opinion.

2.3. Abnormal Audit Fees and Audit Report Lag

One of the most important qualitative characteristics of financial information is the timeliness of the information. Timeliness involves the accessibility and availability of information at the expected time. If information is not available when expected, it will lose its usefulness to users for decision-making (Carslaw & Kaplan, 1991). Financial reporting literature closely relates the delay in presenting financial statements and audit report lag, discussing financial reporting timeliness alongside audit report timeliness. The relevance and usefulness of financial reports decline if they are not timely (FASB, 1980). Moreover, the timeliness of financial reporting is essential for a capital market's good performance (Afify, 2009). Previous studies demonstrate that timeliness adds value to financial information content (Blankley et al., 2014; Schwartz & Soo, 1996). According to Samaha and Khlif (2017), managerial characteristics play an essential role in the timely disclosure of financial information. Information timeliness has a noticeable effect on stock prices; companies that announce their earnings earlier are likely to have higher stock returns (Chambers & Penman, 1984; Givoly & Palmon, 1982; Kross & Schroeder, 1984).

Two groups generally divide the factors affecting financial reporting delays. One group includes firm-specific characteristics, and the other group comprises auditory characteristics. Firm-specific characteristics include financial leverage, good and bad news, profitability, cash earnings per share (cash EPS), firm size, fiscal year-end, complexity, and corporate governance. AL-Shwiyat (2013) demonstrates a connection between financial leverage and financial reporting timeliness. Another factor affecting audit report lag is good and bad news; large companies announce good news more quickly than bad news (Cullinan et al., 2012). Furthermore, there is a negative association between delayed financial statements and firm size since larger firms are more likely to have strong internal controls, resulting in the timely completion of the audit process (Carslaw & Kaplan, 1991).

Based on prior research, audit fees are one of the factors affecting audit report lag. Griffin and Lont (2011) found significant relationships between audit fees and audit report lag, audit report type, client size, and the number of business segments. For example, higher audit fees are more likely to be associated with an unqualified audit report (Banimahd et al., 2012). Furthermore, firm size and audit fees considerably affect audit report lag (Kennedy et al., 2012), and they find that audit firm industry specialization exhibits a significant positive impact on audit fees and a substantial adverse effect on audit report time lag (Yeboah et al., 2023). Large audit firms present audit reports more quickly, and excessive audit fees lead to audit report timeliness. According to Lee et al. (2007), audit report lag negatively correlates with fees paid for non-audit services. Still, it is not significantly related to auditor selection continuity or excessive audit fees. Also, different non-audit fees do not have the same effects on report lag and provide partial support for the implied hierarchy of the Commission (Lai, 2023).

Doogar et al. (2015) present a model for calculating APC, and they find that APC mainly reflects unobserved audit production costs and noise. Therefore, a more thorough investigation of fee residuals can lead to a more accurate calculation of audit fees, affecting audit quality. Audit fees affect liquidity, audit committee independence, audit report lag, and the status of the audit firm, which are all affected by audit fees (Saleh & Ragab, 2023). Auditor specialization, auditor experience, and board independence positively and significantly affected audit quality (Rijal et al., 2023).

Given the prior literature on audit quality and its contributing factors and previous studies on the association between audit quality and audit fees, the present study investigates whether there is a relationship between APC and audit quality.

3. Methodology

3.1. Research Population and Sample

Companies listed on the TSE were included in the research population. The research sample included companies listed on the TSE from the beginning of 2016 until the end of 2020 and met the following conditions: To construct our sample for the paper's hypotheses, we began with all firm-year observations on the Codal database. We then excluded observations with non-calendar fiscal year-end, changes in their fiscal year during the research period (388 firm-year observations), and observations with missing or insufficient variable data (218 firm-year observations). We also excluded firms operating in the banking industry and financial and investment institutions (115 firm-year observations) to test the research hypotheses. This left us with a primary sample of 695 firm-year observations.

This period was selected due to significant regulatory changes and economic events that impacted audit practices and fee structures; in 2015 (effected in audit fees from 2016), the Iranian Association of Certified Public Accountants (IACPA), for the first time, enforced the Regulation of Audit Services Fees (RASF) (audit pricing based on the budget of each project and by taking into account the overhead costs of the audit firm) for its members (Yari et al., 2022). Following the concerns about lowballing in the audit market, in 2021, the IACPA made this regulation stricter.

3.2. Research Models

In this study, first, APC was calculated using Models 1 and 2. Then, the computed values of APC were used to test the research hypotheses. Models 3-6 examined the relationships between the independent variable and other dependent variables, including Type I audit error, Type II audit error, audit quality, and audit report lag. In Model 1, by including the variable *NEW* (i.e., change in audit firm), which equals one if there was a change in audit firm, and zero otherwise, the value of $\boldsymbol{\varepsilon_{it}}$ was calculated. Considering Model 1, we could calculate APC. Error terms created in Model 1 were APC, and Model 2 tested the persistence of APC. Models 3-6 investigated whether fee residuals (APC) were linked to audit quality, audit errors, and audit report lag.

Model 1: Calculating APC using the audit fee model

$$\begin{aligned}\mathrm{Ln(Afee_{it})} = {} & \mathrm{b_0} + \mathrm{b_1 NEW} + \mathrm{b_2 Loss_{it}} + \mathrm{b_3 ROA_{it}} + \mathrm{b_4 LEV_{it}} + \mathrm{b_5 InvRec_{it}} + \mathrm{b_6 Employees_{it}} \\ & + \mathrm{b_7 Nsegments_{it}} + \mathrm{b_8 NewFin_{it}} + \mathrm{b_9 GCO_{it}} + \mathrm{b_{10} ICWeak_{it}} + \mathrm{b_{11} Delay_{it}} \\ & + \mathrm{b_{12} AFiler_{it}} + \mathrm{b_{.13}\ Size_{it}} + \mathrm{Year\ Indicators} + \mathrm{Industry\ Indicators} + \varepsilon_{it}\end{aligned}$$

Model 2: examining the persistence of APC

$$\begin{aligned}\mathrm{Ln(Afee_{it})} = {} & \mathrm{b_0} + \mathrm{b_1 LRFeePos_{it}} + \mathrm{b_2 LRFeeNeg_{it}} + \mathrm{b_3 Loss_{it}} + \mathrm{b_4 ROA_{it}} + \mathrm{b_5 LEV_{it}} \\ & + \mathrm{b_6 InvRec_{it}} + \mathrm{b_7 Employees_{it}} + \mathrm{b_8 Nsegments_{it}} + \mathrm{b_9 NewFin_{it}} + \mathrm{b_{10} GCO_{it}} \\ & + \mathrm{b_{11} ICWeak_{it}} + \mathrm{b_{12} Delay_{it}} + \mathrm{b_{13} AFiler_{it}} + \mathrm{b_{.14}\ Size_{it}} + \mathrm{Year\ Indicators} \\ & + \mathrm{Industry\ Indicators} + \varepsilon_{it}\end{aligned}$$

Model 3: Examining the effect of APC on Type I audit error

$$\begin{aligned}\mathrm{IER} = {} & \mathrm{b_0} + \mathrm{b_1 Apc_{it}} + \mathrm{b_2 Loss_{it}} + \mathrm{b_3 ROA_{it}} + \mathrm{b_4 LEV_{it}} + \mathrm{b_5 InvRec_{it}} + \mathrm{b_6 Employees_{it}} \\ & + \mathrm{b_7 Nsegments_{it}} + \mathrm{b_8 NewFin_{it}} + \mathrm{b_9 GCO_{it}} + \mathrm{b_{10} ICWeak_{it}} + \mathrm{b_{.11}\ Size_{it}} \\ & + \mathrm{b_{12} NEW} + \mathrm{b_{13} AFiler_{it}} + \mathrm{Year\ Indicators} + \mathrm{Industry\ Indicators} + \varepsilon_{it}\end{aligned}$$

Model 4: Examining the effect of APC on Type II audit error

$$\begin{aligned} IIER = {} & b_0 + b_1 Apc_{it} + b_2 Loss_{it} + b_3 ROA_{it} + b_4 LEV_{it} + b_5 InvRec_{it} + b_6 Employees_{it} \\ & + b_7 Nsegments_{it} + b_8 NewFin_{it} + b_9 GCO_{it} + b_{10} ICWeak_{it} + b_{\cdot 11} Size_{it} \\ & + b_{12} NEW + b_{13} AFiler_{it} + Year\ Indicators + Industry\ Indicators + \varepsilon_{it} \end{aligned}$$

Model 5: examining the effect of APC on audit quality

$$\begin{aligned} AQ = {} & b_0 + b_1 Apc_{it} + b_2 Loss_{it} + b_3 ROA_{it} + b_4 LEV_{it} + b_5 InvRec_{it} + b_6 Employees_{it} \\ & + b_7 Nsegments_{it} + b_8 NewFin_{it} + b_9 GCO_{it} + b_{10} ICWeak_{it} + b_{\cdot 11} Size_{it} \\ & + b_{12} NEW + b_{13} AFiler_{it} + Year\ Indicators + Industry\ Indicators + \varepsilon_{it} \end{aligned}$$

Model 6: Examining the effect of APC on audit report lag

$$\begin{aligned} DELAY = {} & b_0 + b_1 Apc_{it} + b_2 Loss_{it} + b_3 ROA_{it} + b_4 LEV_{it} + b_5 InvRec_{it} + b_6 Employees_{it} \\ & + b_7 Nsegments_{it} + b_8 NewFin_{it} + b_9 GCO_{it} + b_{10} ICWeak_{it} + b_{\cdot 11} Size_{it} \\ & + b_{12} NEW + b_{13} AFiler_{it} + Year\ Indicators + Industry\ Indicators + \varepsilon_{it} \end{aligned}$$

3.3. Research Variables Measurement

3.3.1. Dependent Variables

Ln(Afee): Audit fees equal the natural logarithm of the total audit fees paid to the auditor.

AQ: Audit quality is measured using three variables, namely audit firm size, audit firm ranking, and the number of partners. By performing the Exploratory Factor Analysis (EFA), these three variables are combined into one variable.

IER: A Type 1 audit error occurs if the audit report for a given fiscal year is not unqualified and the financial statements are not restated in the subsequent period (i.e., annual adjustments are not identified), resulting in IER equaling 1 and 0 otherwise.

IIER: If the auditor issues an unqualified report for a given fiscal year and the financial statements are restated in the subsequent period (i.e., annual adjustments are identified), a Type II audit error has occurred, and *IIER* equals 1, and 0 otherwise.

Delay: Audit report lag is the number of days between the client's fiscal year-end and the date of the auditor's report.

3.3.2. Independent Variable

This study's independent variable is APC. This variable is obtained by running the first model and equals the error term from the audit fee model. In the second model, the persistence of APC is examined. Models 3-6 determine if the absolute value of APC and the other dependent variables, including audit quality, audit errors, and audit report lag, are significantly related.

3.3.3. Control Variables

SIZE: Firm size is measured by the natural logarithm of total sales.

Loss: If a firm makes a loss in a given fiscal year, it equals 1; otherwise, it equals 0.

ROA: The return rate of the firm's assets, calculated by dividing its net income by its total assets.

LEV: Financial leverage, also called debt ratio, is equal to the ratio of total debts to total assets.

InvRec: Proxies for the audit process complexity by calculating the ratio of the sum of inventory and accounts receivable to total assets.

Employees: The number of the client's employees.

Nsegments: Equals the number of the client's business segments.

NewFin: If a firm issues new shares in a given year, it equals 1, and 0 otherwise.

GCO: A firm with a going concern opinion equals 1, and 0 is otherwise. According to Article 141 of Iran's Commercial Code, if a firm has accumulated losses equal to or exceeding 50 percent of its share capital, it is bankrupt and no longer a going concern.

ICW: It takes the value of 1 if an internal control weakness is disclosed in a firm's audit report and zero otherwise.

After: It equals one if the market value of a firm's shares has increased by 50% compared to the previous year and zero otherwise.

INDUSTRY: It represents the dummy variable of industry and controls for industry effects.

YEAR: It represents the dummy variable of the year and controls for the effects of changes over time.

4. Results

4.1. Descriptive Statistics for Research Variables

As shown in Table 1, the mean for audit fees (*LnAfee*), audit quality (*AQ*), Type I audit error (*IER*), Type II audit error (*IIER*), and audit report lag (*DELAY*) equals 7.604, 0.848, 0.089, 0.430, and 4.237, respectively. The mean for the independent variable, i.e., *APC*, is nearly 0.62.

Table 1
Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
AFILER	0.269	0.000	1.000	0.000	0.444	1.038	2.072
APC	0.616	0.452	4.651	0.000	0.629	2.072	9.684
AQ	0.848	0.627	3.533	0.000	0.576	2.081	8.108
BIG1	0.298	0.000	1.000	0.000	0.457	0.882	1.778
DEALY	4.237	4.276	4.983	2.890	0.388	-0.4535	2.430
GCO	0.026	0.000	1.000	0.000	0.159	5.947	36.376
HHI_ASI	0.110	0.000	1.000	0.000	0.263	2.642	8.688
IC_WEAK	0.312	0.000	1.000	0.000	0.463	0.811	1.658
IER	0.089	0.000	1.000	0.000	0.286	2.868	9.229
IIER	0.430	0.000	1.000	0.000	0.495	0.281	1.079
IMPLOYEES	1020	387	21854	0.000	2498	5.848	41.049
INDUSTRY01	0.140	0.000	1.000	0.000	0.347	2.067	5.274
INDUSTRY02	0.046	0.000	1.000	0.000	0.211	4.287	19.382
INDUSTRY03	0.164	0.000	1.000	0.000	0.370	1.8142	4.291
INDUSTRY04	0.226	0.000	1.000	0.000	0.418	1.306	2.706
INDUSTRY05	0.125	0.000	1.000	0.000	0.330	2.267	6.142
INDUSTRY06	0.125	0.000	1.000	0.000	0.330	2.267	6.142
INDUSTRY07	0.109	0.0000	1.000	0.000	0.312	2.503	7.265
INDUSTRY08	0.01	0.000	1.000	0.000	0.124	7.811	62.015
INDUSTRY09	0.031	0.000	1.000	0.000	0.174	5.388	30.032
INVREC	0.501	0.494	0.969	0.037	0.198	0.029	2.190
LEV	0.611	0.604	4.002	0.090	0.263	3.554	41.55
LNAFEES	7.604	7.092	14.390	3.245	1.861	1.512	5.460
LOSS	0.132	0.000	1.000	0.000	0.339	2.163	5.682
LRFEE	0.398	0.000	1.000	0.000	0.489	0.414	1.172
NESTEGAME	1.883	0.000	79.000	0.000	5.925	8.196	91.472
NEW	0.346	0.000	1.000	0.000	0.476	0.645	1.417
NEWFIN	0.250	0.000	1.000	0.000	0.433	1.154	2.333

NUMBER_OF_ PARTNERS	5.877	4.000	22.000	2.000	4.265	2.428	8.324
ROA	0.091	0.103	2.618	-12.273	0.583	-15.655	306.09
SIZE	14.039	13.888	19.374	8.504	1.544	0.543	4.211
YEAR	1393	1393.	1396.	1391	1.708	-6.91	1.731

4.2. Inferential Statistics

4.2.1. The First and Second Models Testing

APC is calculated using Model 1. The variable *NEW* in Model 1 equals one if a sample firm switches its auditor and zero otherwise. The error term in this model (ε_{it}) is APC. If the audit market is competitive, the coefficient on NEW will be negative, suggesting that auditors may charge lower audit fees.

Table 2
The Results of Model 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AFILER	0.022683	0.040800	0.555947	0.5784
DEALY	-0.136647	0.013986	-9.770582	0.0000
GCO	-0.062912	0.120363	-0.522690	0.6014
IC_WEAK	-0.102218	0.060479	-1.690141	0.0915
IMPLOYEES	0.000321	1.21E-05	26.62017	0.0000
INDUSTRY01	-0.405777	0.135474	-2.995240	0.0028
INDUSTRY02	0.256541	0.277247	0.925317	0.3551
INDUSTRY03	-0.352703	0.125250	-2.815987	0.0050
INDUSTRY04	-0.416103	0.115778	-3.593983	0.0003
INDUSTRY05	-0.090215	0.152473	-0.591679	0.5543
INDUSTRY06	0.180379	0.116323	1.550675	0.1215
INDUSTRY07	0.097713	0.171806	0.568737	0.5697
INDUSTRY08	0.068263	0.278670	0.244960	0.8066
INVREC	-0.642977	0.083780	-7.674551	0.0000
LEV	0.110994	0.054287	2.044571	0.0413
LOSS	-0.073929	0.043219	-1.710584	0.0876
NESTEGAME	0.002099	0.008643	0.242834	0.8082
NEW	-0.103225	0.040675	-2.537797	0.0114
NEWFIN	-0.027592	0.025335	-1.089093	0.2765
ROA	-0.023282	0.069809	-0.333507	0.7389
SIZE	0.370278	0.004486	82.54036	0.0000
YEAR	0.102583	0.010160	10.09661	0.0000
C	-139.8881	14.15131	-9.885168	0.0000
R-squared	0.727279	Mean dependent var	13.70072	
Adjusted R-squared	0.718324	S.D. dependent var	10.54994	
S.E. of regression	1.366854	Sum squared resid	1251.755	
F-statistic	81.21469	Durbin-Watson stat	1.602955	
Prob(F-statistic)	0.000000			

The calculated Prob for Model 1 is less than 0.1, suggesting the overall significance of the model; that is, all the factors included in the model are significantly related to audit fees. As a result, fee residuals (i.e., APC) are also significantly associated with audit fees. Model 2 examines the persistence of the APC obtained from Model 1.

Table 3
The Results of Model 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AFILER	0.026704	0.018139	1.472215	0.1414
DEALY	-0.210377	0.020868	-10.08141	0.0000
GCO	0.167440	0.090878	1.842470	0.0658
IC_WEAK	-0.103868	0.052452	-1.980246	0.0481
IMPLOYEES	0.000304	1.23E-05	24.63980	0.0000
INDUSTRY01	-0.737735	0.033913	-21.75347	0.0000
INDUSTRY02	-0.274327	0.056374	-4.866226	0.0000
INDUSTRY03	-0.935581	0.031296	-29.89424	0.0000
INDUSTRY04	-0.844131	0.055769	-15.13633	0.0000
INDUSTRY05	-0.471396	0.050050	-9.418502	0.0000
INDUSTRY06	-0.314172	0.064246	-4.890129	0.0000
INDUSTRY07	-0.168557	0.056649	-2.975462	0.0030
INDUSTRY08	-0.553163	0.169701	-3.259640	0.0012
INVREC	-0.571822	0.081613	-7.006522	0.0000
LEV	0.372818	0.091622	4.069076	0.0001
LOSS	0.028262	0.060611	0.466277	0.6412
LRFEE	2.140520	0.055865	38.31613	0.0000
NESTEGAME	-0.018398	0.006669	-2.758615	0.0060
NEW	-0.085777	0.021309	-4.025458	0.0001
NEWFIN	-0.082425	0.014401	-5.723423	0.0000
ROA	-0.053730	0.011801	-4.553180	0.0000
SIZE	0.358819	0.007934	45.22529	0.0000
YEAR	0.097018	0.011646	8.330377	0.0000
C	-132.1739	16.22939	-8.144105	0.0000
R-squared	0.907603	Mean dependent var		12.03817
Adjusted R-squared	0.904426	S.D. dependent var		8.010603
S.E. of regression	0.890221	Sum squared resid		530.1786
F-statistic	285.7159	Durbin-Watson stat		2.007877
Prob(F-statistic)	0.000000			

As the obtained Prob is less than 0.1, APC is significantly related to audit fees. As indicated in Table 3, since the Durbin-Watson statistic has a value of 2, there is no autocorrelation in the sample. After calculating APC, its absolute values are used to test hypotheses 1 to 4.

4.2.2. Third Model Testing

The following model tests the first hypothesis. It examines the relationship between the absolute value of the APC obtained from the previous models and Type I audit error.

Hypothesis 1: A significant relationship exists between abnormal audit profits or costs and Type I audit error (IER).

$$IER = b_0 + b_1 Apc_{it} + b_2 Loss_{it} + b_3 ROA_{it} + b_4 LEV_{it} + b_5 InvRec_{it} + b_6 Employees_{it} + b_7 Nsegments_{it} + b_8 NewFin_{it} + b_9 GCO_{it} + b_{10} ICWeak_{it} + b_{11} Size_{it} + b_{12} NEW + b_{13} AFiler_{it} + Year\ Indicators + Industry\ Indicators +$$

Table 4
The Results of Model 3 (Absolute Values)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AFILER	-0.001596	0.002819	-0.566306	0.5714
APC	0.003337	0.001388	2.405212	0.0165
GCO	-0.006586	0.003879	-1.697685	0.0901
IC_WEAK	-6.26E-05	0.002078	-0.030133	0.9760
IMPLOYEES	-7.94E-07	4.53E-07	-1.751109	0.0804

INDUSTRY01	0.003591	0.001942	1.848920	0.0650
INDUSTRY02	-0.003618	0.001511	-2.395331	0.0169
INDUSTRY03	0.006144	0.003282	1.871980	0.0617
INDUSTRY04	0.005393	0.002434	2.215876	0.0271
INDUSTRY05	-5.26E-05	0.001376	-0.038243	0.9695
INDUSTRY06	-0.001327	0.001488	-0.891788	0.3729
INDUSTRY07	0.031418	0.011201	2.804880	0.0052
INDUSTRY08	-0.002177	0.009871	-0.220498	0.8256
INVREC	-0.018660	0.008847	-2.109197	0.0353
LEV	0.024206	0.011795	2.052151	0.0406
LOSS	-0.003280	0.004029	-0.814059	0.4159
NESTEGAME	-6.90E-06	7.40E-05	-0.093231	0.9258
NEW	-0.004324	0.001247	-3.468552	0.0006
NEWFIN	0.001295	0.001410	0.918123	0.3589
ROA	0.001224	0.000468	2.617646	0.0091
SIZE	-0.002536	0.000746	-3.400889	0.0007
YEAR	0.002547	0.000547	4.658257	0.0000
C	-3.514074	0.751612	-4.675381	0.0000
R-squared	0.33481	Mean dependent var		0.057389
Adjusted R-squared	0.222995	S.D. dependent var		0.180733
S.E. of regression	0.191363	Sum squared resid		21.78871
F-statistic	85.369593	Durbin-Watson stat		1.715743
Prob(F-statistic)	0.000000			

According to Table 4, the results of the first hypothesis testing show a significant and positive relationship between APC and Type I audit error (IER); in other words, higher APC leads to increased Type I audit error (IER).

4.2.3. The Fourth Model Testing

Hypothesis 2: A significant relationship exists between abnormal audit profits or costs and Type II audit error ($IIER$).

$$IIER = b_0 + b_1 Apc_{it} + b_2 Loss_{it} + b_3 ROA_{it} + b_4 LEV_{it} + b_5 InvRec_{it} + b_6 Employees_{it} + b_7 Nsegments_{it} + b_8 NewFin_{it} + b_9 GCO_{it} + b_{10} ICWeak_{it} + b_{11} Size_{it} + b_{12} NEW + b_{13} AFiler_{it} + Year\ Indicators + Industry\ Indicators + \varepsilon_{it}$$

Table 5
The Results of Model 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AFILER	0.043856	0.019707	2.225419	0.0264
APC	-0.142669	0.035566	-4.011359	0.0001
GCO	-0.088422	0.060621	-1.458603	0.1451
IC_WEAK	-0.100155	0.022819	-4.389170	0.0000
IMPLOYEES	-9.52E-06	7.65E-06	-1.244661	0.2137
INDUSTRY01	-0.135921	0.075543	-1.799243	0.0724
INDUSTRY02	-0.156393	0.127357	-1.227991	0.2199
INDUSTRY03	-0.252125	0.079781	-3.160202	0.0016
INDUSTRY04	-0.210243	0.042499	-4.946980	0.0000
INDUSTRY05	-0.252050	0.098122	-2.568736	0.0104
INDUSTRY06	-0.105951	0.055558	-1.907030	0.0569
INDUSTRY07	-0.458373	0.059270	-7.733623	0.0000
INDUSTRY08	-0.197873	0.134986	-1.465877	0.1431

INVREC	-0.183063	0.103055	-1.776368	0.0761
LEV	-0.110386	0.045447	-2.428876	0.0154
LOSS	-0.094788	0.042388	-2.236211	0.0256
NESTEGAME	0.001880	0.002638	0.712927	0.4761
NEW	0.130329	0.032141	4.054971	0.0001
NEWFIN	-0.003789	0.012157	-0.311663	0.7554
ROA	0.025384	0.024614	1.031287	0.3028
SIZE	-0.003185	0.013161	-0.242044	0.8088
YEAR	0.064775	0.027372	2.366450	0.0182
C	-89.37190	38.17561	-2.341073	0.0195
R-squared	0.250984	Mean dependent var		0.410510
Adjusted R-squared	0.228129	S.D. dependent var		0.492649
S.E. of regression	0.464814	Sum squared resid		155.7733
F-statistic	10.98165	Durbin-Watson stat		2.322603
Prob(F-statistic)	0.000000			

The results of the second hypothesis test show a significant and negative relationship between APC and Type II audit errors. Higher APC leads to reduced Type II audit errors (Table 5). Based on the findings for the first and second hypotheses, our study finds a positive relationship between abnormal audit profits (APC) and Type I errors but a negative relationship with Type II errors. This can be understood through the lens of audit risk and auditor behavior. Type I errors occur when an auditor incorrectly concludes that there is a material misstatement in the financial statements when there is none. The positive relationship between APC and Type I errors suggests that higher abnormal audit profits may lead auditors to be more conservative, possibly due to increased scrutiny and the desire to avoid litigation or reputational damage. This conservatism can result in more frequent Type I errors, as auditors may overstate issues to ensure they are not missing any potential misstatements.

Type II errors, on the other hand, occur when an auditor fails to detect a material misstatement that does exist. The negative relationship between APC and Type II errors indicates that higher abnormal audit profits are associated with fewer Type II errors. This could be because auditors with higher APC are investing more resources and effort into the audit process, thereby improving their ability to detect actual misstatements. These findings align with existing theories on audit quality and auditor behavior. For instance, the hypothesis that higher audit fees (including abnormal profits) can lead to better audit quality due to increased auditor effort and resources is supported by studies such as those by Asthana and Boone (2012). Additionally, the relationship between audit fees and audit errors is consistent with the notion that economic incentives and pressures influence auditor behavior and decision-making.

4.2.4. The Fifth Model Testing

Hypothesis 3: A significant relationship exists between abnormal audit profits or costs and audit quality (*AQ*).

$$AQ = b_0 + b_1 Apc_{it} + b_2 Loss_{it} + b_3 ROA_{it} + b_4 LEV_{it} + b_5 InvRec_{it} + b_6 Employees_{it} + b_7 Nsegments_{it} + b_8 NewFin_{it} + b_9 GCO_{it} + b_{10} ICWeak_{it} + b_{11} Size_{it} + b_{12} NEW + b_{13} AFiler_{it} + Year\ Indicators + Industry\ Indicators + \varepsilon_{it}$$

Table 6
The Results of Model 5 (Absolute Values)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AFILER	0.015909	0.019911	0.799008	0.4245
APC	0.037808	0.008896	4.250039	0.0000
GCO	0.125953	0.040141	3.137796	0.0018
IC_WEAK	-0.092845	0.020372	-4.557472	0.0000

IMPLOYEES	-3.51E-06	3.03E-06	-1.160127	0.2464
INDUSTRY01	-0.025029	0.015541	-1.610522	0.1077
INDUSTRY02	-0.135480	0.042070	-3.220352	0.0013
INDUSTRY03	-0.010234	0.022267	-0.459613	0.6459
INDUSTRY04	-0.074332	0.020435	-3.637468	0.0003
INDUSTRY05	-0.065118	0.017734	-3.671919	0.0003
INDUSTRY06	0.001183	0.020757	0.057011	0.9546
INDUSTRY07	0.069732	0.026999	2.582785	0.0100
INDUSTRY08	0.010648	0.092140	0.115561	0.9080
LEV	-0.039455	0.055211	-0.714622	0.4751
INVREC	0.033599	0.042370	0.792988	0.4280
LOSS	0.057546	0.024242	2.373803	0.0179
NESTEGAME	-0.000527	0.001790	-0.294307	0.7686
NEW	-0.039772	0.018896	-2.104725	0.0357
NEWFIN	-0.067952	0.006941	-9.790430	0.0000
ROA	-0.042131	0.032926	-1.279552	0.2011
SIZE	0.079935	0.005021	15.91933	0.0000
YEAR	0.041645	0.003343	12.45555	0.0000
C	-58.28706	4.647951	-12.54038	0.0000
R-squared	0.421446	Mean dependent var		1.423562
Adjusted R-squared	0.403817	S.D. dependent var		1.241953
S.E. of regression	0.502542	Sum squared resid		182.3398
F-statistic	23.90632	Durbin-Watson stat		1.877928
Prob(F-statistic)	0.000000			

As presented in Table 6, the results of the third hypothesis testing suggest a significant and positive relationship between APC and audit quality. In other words, the higher the APC, the higher the audit quality.

4.2.5. The Sixth Model Testing

Hypothesis 4: A significant relationship exists between abnormal audit profits or costs and audit report lag (*DELAY*).

$$DELAY = b_0 + b_1 Apc_{it} + b_2 Loss_{it} + b_3 ROA_{it} + b_4 LEV_{it} + b_5 InvRec_{it} + b_6 Employees_{it} + b_7 Nsegments_{it} + b_8 NewFin_{it} + b_9 GCO_{it} + b_{10} ICWeak_{it} + b_{.11}\, Size_{it} + b_{12} NEW + b_{13} AFiler_{it} + Year\ Indicators + Industry\ Indicators + \varepsilon_{it}$$

Table 7
The Results of Model 6 (Absolute Values)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AFILER	0.023329	0.016445	1.418627	0.1564
APC	0.030539	0.012161	2.511106	0.0123
GCO	-0.045044	0.068769	-0.655000	0.5127
IC_WEAK	0.014523	0.027347	0.531053	0.5955
IMPLOYEES	1.13E-05	4.30E-06	2.618002	0.0090
INDUSTRY01	-0.126536	0.072474	-1.745951	0.0812
INDUSTRY02	0.047098	0.055456	0.849284	0.3960
INDUSTRY03	0.000198	0.027138	0.007281	0.9942
INDUSTRY04	-0.109029	0.042429	-2.569680	0.0104
INDUSTRY05	-0.111158	0.041486	-2.679426	0.0075

INDUSTRY06	-0.016323	0.047957	-0.340371	0.7337
INDUSTRY07	-0.298956	0.039003	-7.664888	0.0000
INDUSTRY08	-0.393088	0.066852	-5.879981	0.0000
INVREC	-0.154391	0.038412	-4.019332	0.0001
LEV	-0.025869	0.013694	-1.889054	0.0593
LOSS	-0.055676	0.020143	-2.764048	0.0059
NESTEGAME	-7.02E-05	0.000783	-0.089638	0.9286
NEW	0.000690	0.026564	0.025980	0.9793
NEWFIN	0.034507	0.012671	2.723303	0.0066
ROA	0.008345	0.005237	1.593477	0.1115
SIZE	0.004831	0.010175	0.474776	0.6351
YEAR	0.019013	0.003340	5.691957	0.0000
C	-22.16216	4.651967	-4.764041	0.0000
R-squared	0.153406	Mean dependent var		5.397097
Adjusted R-squared	0.127574	S.D. dependent var		2.288450
S.E. of regression	0.380301	Sum squared resid		104.2773
F-statistic	5.938543	Durbin-Watson stat		1.686436
Prob(F-statistic)	0.000000			

As indicated in Table 7, the results of the fourth hypothesis testing suggest a positive and significant relationship between audit report lag and APC. A higher APC is linked to a longer audit report lag.

5. Discussion

The paper is primarily focused on calculating APC using the audit fee model, examining the persistence of APC, and investigating whether the calculated APC is related to audit errors, audit quality, and audit report lag. The first model calculates audit fees considering auditor changes. The first model's residuals are APC (the error term from the audit fee model). The second model examines the persistence of APC obtained from the first model, the audit fee model adapted from Doogar et al. (2015). The results obtained demonstrate that there is a positive and significant relationship between APC and audit fees. This is consistent with Choi et al. (2010), Hribar et al. (2014), Simunic (1980), and DeAngelo (1981), indicating that there is a positive relationship between favorable abnormal audit fees and discretionary accruals. Most of the extensive research on audit fees (e.g., Boo & Sharma, 2008; Doogar et al., 2015; Mellett et al., 2007; O'Sullivan, 2009; Seetharaman et al., 2002) focuses on identifying factors influencing audit fees and utilizes a similar statistical method (regression analysis). In business communication, transparent and effective communication between auditors and clients is crucial for understanding and negotiating audit fees.

The results of the first hypothesis testing indicate that APC is significantly and positively related to Type I audit error (IER). In contrast, the results of the second hypothesis suggest that APC has a negative and significant relationship with Type II audit error ($IIER$). Type I errors occur when auditors incorrectly identify a material misstatement, while Type II errors happen when auditors fail to detect an actual misstatement. Higher APC leads to more Type I errors due to increased auditor conservatism, possibly driven by scrutiny and the desire to avoid litigation. Conversely, higher APC results in fewer Type II errors as auditors invest more resources and effort into the audit process, improving their ability to detect actual misstatements. These findings align with existing theories that suggest higher audit fees can lead to better audit quality due to increased auditor effort and resources. Leveraging technology can further enhance the accuracy and efficiency of audits, reducing the likelihood of errors and improving overall audit quality. To the best of the authors' knowledge, there is no research on the effect of APC on audit fees; however, these results are consistent with the findings of Noravesh et al. (2017) and Mohammad Rezaei et al. (2018), which investigate audit errors and their relationship with audit fees.

The results of the third hypothesis testing indicate a positive and significant relationship between the absolute value of APC and audit quality. This finding is consistent with Ettredge et al. (2014) and inconsistent with Xinhua (2009), which states that favorable abnormal audit fees and audit quality have a negative and significant relationship because higher audit fees impair auditor independence and thus reduce audit quality. This study's results align with Desai (2012), which considers audit firm size as a measure of audit quality and finds that larger firms (higher quality) receive higher audit fees. Choi et al. (2010) state that no significant relationship exists between opposing abnormal fees and audit quality.

The significant and positive relationship between APC and audit fees suggests that the higher the audit fees in Iran, the higher the APC or audit fee residuals. Moreover, our study found a positive association between APC and audit quality because APC in Iran may mainly consist of unobserved audit production costs rather than auditor rents. Therefore, higher audit fees lead to increased APC and audit quality. This finding aligns with the theoretical perspective of APC. Research by Doogar et al. (2015) suggests that APC primarily consists of unobserved audit production costs rather than auditor rents.

The constrained nature of the Iranian audit market, characterized by intense competition among many small audit firms and government policies, creates cost pressures that can entrench low audit quality. This environment suggests that APC in Iran is more likely to represent the actual costs of conducting audits rather than excess profits or auditor rents. The theory that higher audit fees (including abnormal profits) can lead to better audit quality due to increased auditor effort and resources is supported by studies such as those by Asthana and Boone (2012) and Bhatia et al. (2015).

The results of the fourth hypothesis testing indicate a positive and significant relationship between the absolute value of APC and audit report lag. According to Mohammad Rezaei et al. (2018), the percentage of financial restatements and, thus, audit errors in Iran is very high, but audit report lag is on the decline. According to their findings, audit report lag does not show a significant relationship with Type I audit errors but exhibits a negative and significant relationship with Type II audit errors. Moreover, as Vaez and Ahmadi (2014) suggest, audit fees and audit report lag have a positive and significant relationship.

Based on these results, hypotheses 1, 2, and 4 investigate whether APC is connected to audit errors and late audit reports. The results show that APC is significantly and positively connected to Type I audit errors and late audit reports, but negatively and significantly linked to Type II audit errors.

Given the positive association between APC and audit quality and the direct relationship between the increase in fees and APC, if an audit firm accepts an audit engagement at a lower price than other competitors or its previous audit engagement, the audit firm should announce the details, such as the accurate hours of work and the number of the expert and experienced workforce, and declare that quality control policies and procedures have been followed. Anything that may tarnish the quality of the service they provide should be fully clarified. The Iranian Association of Certified Public Accountants (IACPA) and the Iranian Audit Organization can reduce the chances of auditor-client collusion by establishing a framework that controls auditor tenure and audit fees. Future research could investigate the relationship between APC and auditor industry expertise, as auditor expertise is one of the factors affecting audit fees. Therefore, audit firms should enhance their auditors' skills by providing adequate industry-specific training to improve efficiency and effectiveness and present more reliable audit reports.

Unavoidably, all studies face limitations that can affect the interpretation of the results, and the present research is no exception. As the disclosure of audit fees is voluntary, the selected sample is biased since it includes firms disclosing their fees. This study uses the systematic elimination method for sample selection, so some industries, such as financial intermediaries, are removed; thus, one should be cautious when generalizing the results to the excluded industries. Future research could examine how macroeconomic variables affect audit errors during recessions, inflation, and sanctions.

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