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Article

The Effect of Mandatory Audit Firm Rotation on Earnings Management and Audit Fees: Evidence from Iran

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Abstract: The present study aims to investigate the effects of mandatory requirements of audit firm rotation on earnings management among companies listed on the Tehran Stock Exchange (TSE). The study population consists of 1030 observations and 103 companies listed on the TSE during the years 2003–2012; moreover, the statistical technique used to test the hypotheses is panel data and pooled data. The results showed that the rule of mandatory audit firm rotation increased accruals-based earnings management (AEM) significantly. In addition, outcomes demonstrated that mandatory requirements of audit firm rotation did not have a significant influence on real earnings management (REM) and audit fees. Overall, our findings proved that the mandatory requirements of audit firm rotation in Iran have not been able to prevent the opportunistic actions of management at a time when they were faced with severe financial problems because of economic sanctions and auditors taking standardized systems-based auditing approaches. This research will make investors and others aware of the fact that mandatory audit firm rotation might be not effective in stopping managers wishing to manipulate the accounting figures. This paper actually suggests that when firms have financial distress, regulatory mechanisms such as audit firm rotation may not have a deterrent role. Our findings give lawmakers a stark warning that the length of an audit firm's tenure should be based on the features of the audit market structure of each country.

Keywords: mandatory audit firm rotation; accruals-based earnings management; real earnings management; audit fee; Tehran Stock Exchange



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1. Introduction

Owing to the important role that auditing has in financial statements, it has always enjoyed a high status in capital markets and accounting professions. Due to the important role of auditing, there is always a concern that the quality of the audit is so high that it cannot execute this risky role well. Globalization has been accompanied by the development and dynamism of the market as well as increasing instability among the big and famous companies. Recent financial scandals globally have also raised concerns about the ability to rely on financial statements. In addition, the pressure of financial crises in many countries has increased the demand for high-quality auditing during recent years (Zureigat 2011; Kim 2021; Escaloni and Mareque 2021; Lukason and Camacho-Miñano 2021; Lukason and Camacho-Miñano 2019). Due to terrible financial scandals of companies such as Enron and WorldCom in the United States or Pacific Electric Wire & Cable and Summit Technology in Taiwan (Chen 2016), as well companies in the European financial crisis such as Parmalat in Italy, Ahold in the Netherlands, and Gescartera & BBVA in Spain, reliance on financial

statements and audit work has been mistrustful (Pucheta-Martínez and Fuentes 2007). In the United States, to restore public confidence in financial statements, the Sarbanes-Oxley Act was passed which forced the circulation of audit partners and also emphasized the need for more research on the issue of compulsory circulation of audit firms (Chi 2011). To improve an auditor's independence, the European Commission also introduced a Green Paper incorporating a suggestion of obligatory audit firm rotation (Cicovic and Dhanoa 2016). Special attention has been paid to auditors' rotation to maintain the independence of auditors since auditors' independence is an important issue in building the reliability of the audit report. It is predictable that if the circulation of audit firms is mandatory, auditors' independence increases (Daniels and Booker 2011). Undoubtedly, the compulsory circulation of audit firms has always been one of the potential ways to improve the quality of the audit, and it has attracted more attention during recent years due to bolstering of the role of auditors in capital markets (Harris 2012).

The lack of robust institutional mechanisms for timely identification of the causes of audit firms' failure in some markets has led to government policy being adopted in a way that audit firm rotation as a mandatory law is considered (Narayanaswamy and Raghunandan 2019). A few countries, such as India, Singapore, South Korea, Italy, and Brazil, have legal requirements for the rotation of audit firms within a given timeframe. For example, Italy has had mandatory audit firm rotation for the largest listed firms since 1975 and all listed firms since 1980. Until 2010, the auditor was to be hired for a three-year term with the option of two more three-year terms, i.e., a maximum of nine years. Between 2006 and 2010, the South Korean government officially announced that all listed companies must have an audit rotation every six years, too. Furthermore, in India, the Companies Act 2013 mandates audit firm rotation after a maximum of two five-year terms if the audit firm is a partnership and after one five-year term if the audit firm is a proprietorship. There should be no common partners in the outgoing and incoming audit firms. Appointments will be for a fixed five-year term (Narayanaswamy and Raghunandan 2019). Similarly, in Iran, laws have been enacted to make audit rotation mandatory. In Iran, according to the requirements of the Securities and Exchange Organization that were announced in July 2007, companies listed on the TSE are not allowed to use a specific independent auditor for a maximum of four consecutive years. After completing the four-year period, they are required to change their independent auditor. What is worth mentioning is that although it has been more than a decade since the first mandatory requirement of audit firms' rotation in Iran took place, no internal research has been conducted on the effects of these requirements on the audit market. Another important point is that almost from 2007 onward, Iran has faced various economic sanctions; hence, most Iranian firms have had financial distress. In such an economic situation, the question arises as to whether the compulsory audit firm rotation can improve the auditing quality so that managers have fewer opportunities to commit financial fraud. Does this law in the Iran setting have a deterrent role and reduce audit risk, or do executives, because of the financial pressures on the company, manipulate the financial statements to mask the poor financial performance? We are going to investigate if the legal requirements of the audit firms' rotation on the TSE have been able to reduce earnings management activities and audit risk. Otherwise, are there other reasons in the Iranian audit market that will not make this law effective? Finding the answer to all of these questions is the primary focus of this research, which can have a beautiful outlook for researchers.

This article has many different practical implications for financial statement readers. Our outcomes will show them that, before analyzing the effects of a new law on audit quality, particular attention must be paid to the quality of the audit market infrastructure and the economic conditions of each country's capital market. In other words, the results of this investigation will correctly state that the financial position of companies in some of the distressed markets creates conditions that increase management incentives for financial fraud, which can seriously threaten the health and independence of auditors. Now, if the auditing market in emerging economies, including Iran, does not meet the required quality

standards, the probability of lowering the quality of financial information and auditing risk can be significantly more. The study of this paper will also be excellent for lawmakers of capital markets as the results will indicate that before the implementation of various mechanisms to improve the quality of auditing, the economic infrastructure of the market needs to be thoroughly analyzed to determine whether the benefits of the mandatory audit firm rotation's implementation outweigh its costs.

The rest of this study is organized as follows: the next part frames the study into a theoretical framework, hypotheses development, and literature. Section 3 indicates the research design and outlines, where data and the sample selection procedure are investigated. Section 4 then presents the main results and implications drawn from statistical analyses. Finally, Section 5 provides the conclusion.

2. Literature Review and Hypotheses Development

Auditors are being blamed for recent financial scandals globally, although the management of the company is responsible for the preparation of financial statements. The public opinion is that the lack of independence and the poor quality of auditing has led to financial scandals like Enron and WorldCom (Li 2007). Hence, the law of compulsory rotation of auditors and the limitation of their period of tenure was approved in some countries; an example of which is the Sarbanes-Oxley Act of July 2002 (Chi 2011). In Iran, the legal requirements of the Tehran Stock Exchange to change the auditor of the companies is obviously due to the concern of capital market players about the independence and quality of the audit and so on. According to the regulations of the Securities and Exchange Organization (SEO) on 30 July 2007, firms listed on the TSE are allowed to use a specific independent auditor for a maximum of four consecutive years. After completing the four years, they are required to change their independent auditor. On the other hand, the audit profession claims that there is no evidence that the auditor's independence is diminishing, and the consequences of such restrictive laws are increasing costs for clients and investors. Since auditors are considered as controlling factors for the client's profit management, their controlling influence on earnings management will be undermined by compromising their independence (Levitt 1998).

According to agency theory, due to the separation of management from ownership, managers tend to pursue their self-interest and do not care about shareholders' wealth maximization, which results in increasing information asymmetry between them (Jensen and Meckling 1976; Salehi et al. 2017, 2018b). According to agency theory, auditing is also a service that will not be excluded from the cost-benefit principle (Tarighi et al. 2022b). Certainly, in such a situation, there is a need for a trusted external third party to confirm the accuracy of financial information. From the point of view of agency theory, independent auditing is one of the important mechanisms of corporate governance that significantly helps shareholders to monitor management's activities (Tarighi et al. 2022b). Auditors are perceived to be the agents of the principals, to provide reasonable assurance that the financial statements of the company do not contain material misstatements (Arens et al. 2016). Independent auditors actually can reduce information asymmetry if their independence is not compromised by the clients. One cannot ignore the key role of knowledge of the client's business operations and the working relationship between the client's management and audit firm in audit quality (Corbella et al. 2015). In this regard, in the financial literature, there are two views on the rotation of auditors, each of which has its fans.

The advocates of the audit firm's rotation believe that if auditors are forced to change, they will be able to resist the pressure of corporate executives. The long-term working relationship between the auditor and the client creates a tendency to attract the attention of the client, a situation that undermines the auditors' independence and neutrality. In keeping with this notion, various studies have shown that auditors' judgments are influenced by long-term relationships between the auditor and the client (Bates et al. 1982; Copley and Doucet 1993; Vanstraelen 2000; Corbella et al. 2015; Cicovic and Dhanoa 2016). Moreover,

to compensate for the initial costs incurred by auditors in the early years of their activity for a new client, they have a strong tendency to retain their clients (Davis et al. 2002). In this regard, Hamilton et al. (2005) in Australia proved that audit partner changes most likely reflecting partner rotation are linked to lower signed unexpected accruals and that for Big 5 clients this relation is driven by less significant positive unexpected accruals following partner changes. Carey and Simnett (2006), using data from Australia, investigated the connection between audit partner tenure and audit quality. They concluded that when the audit tenure is more than seven years, obligatory audit partner rotation negatively affects audit quality. In Malaysia, Bamahros and Hussin (2015) found that longer audit firm tenure reduces earnings management. Moreover, Wahab et al. (2007), and Ameer and Rahman (2009) figured out that Minority Shareholder Watchdog Group (MSWG) activism could provide minority shareholders and institutional investors with resourceful solutions to reduce information asymmetries and improve corporate financial performance. In an emerging market called Korea, Kim and Yi (2006) inferred that the amount of discretionary accruals is lower in firms with mandatory auditor changes compared to firms with voluntary ones. In addition, Chung (2004) suggested that the level of optional accruals will be reduced as a result of the change of auditor. He actually believed that any restrictions on the relationship between the auditor and the client will improve the auditing quality. Alhadab and Clacher (2018) found that high-quality audit firms had been able to reduce the level of real and accrual-based earnings management among UK IPOs firms. Chi and Huang (2005) in Taiwan inferred that a new audit partner increases the audit quality. Gates et al. (2007) proved that even in an environment of strong controls for corporate governance, audit firm rotation incrementally influenced individuals' confidence in financial statements. In short, all the above-mentioned investigations testify that the existence of audit firm rotation is a good idea for reducing financial misreporting.

The usefulness of the mandatory auditor rotation law has so far been studied in many countries, and the results have not yet proved that the advantages of applying this law outweigh its disadvantages (Cameran et al. 2015). Davis et al. (2002) surveyed the relationship between the length of auditor tenure and the extent of corporate earnings management using a sample of 855 companies over the period 1981 to 1998. They saw a positive association between audit tenure and absolute discretionary accruals and a negative relation between audit tenure and absolute analyst forecast errors. Their outcomes also witnessed a significant negative relationship between auditor tenure and signed discretionary accruals. Likewise, Johnson et al. (2002) observed that relative to medium audit-firm tenures of four to eight years and short audit-firm tenures of two to three years are connected with lower-quality financial reports. In contrast, there is no evidence of reduced financial-reporting quality for longer audit-firm tenures of nine or more years. In the Iran market, Karami et al. (2011) showed that as auditor tenure increases, the reporting flexibility in management using discretionary accruals rises. They saw a significant negative relationship that is consistent with the view that management uses reporting flexibility to reduce reported earnings. Choi and Doogar (2005) think that with the increase in an auditor's tenure, auditors' willingness to issue a going concern opinion decreases.

Using a sample of 3621 Australian firm years between 1998 and 2003, Fargher et al. (2008) indicated that when a new audit partner is from a different audit firm to the outgoing partner (audit firm rotation), client directors' accounting discretion surges in those early years. Myers et al. (2003) realized that higher earnings quality is associated with longer auditor tenure. Similarly, Ghosh and Moon (2005) believed that investors and information intermediaries perceive auditor tenure as improving audit quality. Geiger and Raghunandan (2002) found that there is an inverse relationship between auditor tenure and audit reporting failures. In another similar study, Carcello and Nagy (2004) carried out research entitled "audit firm tenure and fraudulent financial reporting" in the USA market. They understood that the existence of mandatory audit firm rotation could have adverse effects on audit quality since their results showed fraudulent financial reporting is more likely to happen in the first three years of the auditor-client working relationship. In general,

the results of Geiger and Raghunandan (2002), Johnson et al. (2002), Myers et al. (2003), Carcello and Nagy (2004), and Ghosh and Moon (2005) did not support the idea of audit firm rotation in the USA context. According to research conducted in the Chinese market, Firth et al. (2012) recognized that companies with compulsory audit partner circulation are connected with a meaningfully greater probability of a modified audit opinion than no-rotation companies. Finally, based on a new study among UK companies, El Guindy and Basuony (2018) concluded that there is a negative relationship between audit firm tenure and earnings management. However, in Turkey, Can (2019) figured out that mandatory audit firm rotation was not linked to the earnings management via discretionary accruals and real activities manipulations.

Certainly, the effectiveness of this mechanism in emerging markets such as Iran cannot be commented on. Suppose that if the auditor's mandatory rotation mechanism in the Iranian market is not thoughtful, can one expect proper feedback? It should be highlighted that the main purpose of Iran's strategy of mandatory audit firm rotation after four years is to reduce auditors' motivations for rising long-term working relationships with their clients so that their independence will be better. Via the mandatory change in the auditors, there will be a decrease in the cost of equity capital because investors believe that compulsory audit firm rotation provides an atmosphere for qualified audits by improving auditor independence (Kim et al. 2019). According to Azizkhani et al. (2018), this policy was implemented by Iran's SEO to increase audit market competition and provide opportunities for small audit firms to gain clients. Since intense competition weakens auditors' revenue, in such awful conditions, audit firms are expected to mainly hire junior accounting students (Azizkhani et al. 2018). In addition, due to the intense competition of auditors as well as lowering the level of auditors' income, investments in audit technologies and experienced senior workforce has not been thought of as an economical tool by audit firms, which leads to the neglect of appropriate audit planning (Azizkhani et al. 2018). The audit firms that do have a risk analysis in their audit planning, often take standardized systems-based auditing approaches (Griffiths 2016). As before mentioned, owing to severe economic sanctions against Iran during recent years, Iranian corporate executives have a lot of incentive to manipulate financial reports so that they can show a better picture of their financial performance (Salehi et al. 2018b; Tarighi et al. 2022a, 2022b). Further, a lot of research has shown that when audit quality is high, the potential of earnings management by opportunistic managers will be reduced remarkably (Alzoubi 2018; Alhadab and Clacher 2018). Salehi et al. (2018b) found a negative link between the bigger audit firms and discretionary accruals; further, the relationship between abnormal accruals and GCO in firms audited by high-quality audit firms is higher than other firms because they believed that the existence of such an association is owing to not only auditor conservatism but also financially distressed firms in Iran.

Therefore, we expect that a manager tending to manipulate financial reports is likely to identify the auditor's foreseeable methods because Iranian audit firms often adopt systems-based auditing approaches since there is an intensive atmosphere of price-based competition of the Iranian audit market and auditors have to employ inexperienced staff and repetitive audit tests that should be economical in terms of revenue. It is likely that during this four-year tenure period, audit firms with their own predictable systems-based auditing approach in the Iranian market will make managers manage profits more. It is also important to recall this key point that various research in the Iranian market has shown that the risk of litigation against independent auditors is very low (Mahmudi 2010; Bagherpour et al. 2014). As stated by Article 154 of Iran's Trade Law, when auditors cause losses to clients and third parties, the losses incurred by their negligence must be compensated although there are no publicly reported cases of prosecution of auditors for negligence (Azizkhani et al. 2018). In short, when the level of litigation risk against the auditing profession in Iran is not significant, auditors can be expected to have fewer motivations for maintaining their independence or audit quality. In keeping with the research literature mentioned, we expect the first and second hypotheses of this research to be as follows:

Hypothesis 1 (H1). *The mandatory requirements of auditor's rotation lead to higher accruals-based earnings management.*

Hypothesis 2 (H2). *The mandatory requirements of auditor's rotation lead to higher real earnings management.*

Opponents of the compulsory rotation of audit firms believe that for many reasons, such as unfamiliarity with the new client and the need for a broader review of the work process of the new client (to maintain the quality of the audit work), audit firms should spend more time and cost in the first years of the audit. On the other hand, because the compulsory circulation of auditors creates a situation in which the auditor will lose their clients after a certain time, they must compete with other auditors and therefore have more flexibility to acquire new clients (Hassas Yeganeh et al. 2016). Given that typically the work time spent on auditing is considered as the basis for the determination of audit fees, if the circulation of audit firms and the existence of an appropriate audit committee are mandatory, the amount of the audit fee will increase. Research on Nigerian gas and oil companies has shown that when the amount of the audit fee increases, one can expect to have a better-quality audit process (Okegbe et al. 2019). Evidence from a developing country called Indonesia shows that audit quality improves when the audit firm's tenure period increases (Rahmina and Agoes 2014). Moreover, Kwon et al. (2014) showed that the compulsory circulation of the audit firms has no significant effect on the quality of the audit in South Korea. They also found that after the mandatory circulation rules of the auditing firms in Korea, audit fees have increased significantly. Since 2004 in China, the law has required firms to rotate signing audit partners of audit reports every five years; hence, Bandyopadhyay et al. (2014) evaluated the impact of mandatory audit partner rotation (MPR) on audit quality. They realized that audit quality improved in the three years immediately following a client firm's MPR between 2004 and 2011 for Chinese publicly listed firms. Nevertheless, mandatory audit partner rotation (MPR) was not able to recover audit quality in jurisdictions where legal conventions are more developed. Bratten et al. (2019) saw a positive and strong connection between audit firm tenure and financial reporting quality among more complex banks, too.

Among 266 publicly listed Australian firms, Ball et al. (2015) witnessed a negative association between the length of tenure between the lead audit partner and client firm management (person-to-person relations) and audit quality. In opposition, they observed a positive connection between audit firm engagement by the client (firm-to-firm relations) and audit quality. Based on evidence from the Italian context, Cameran et al. (2015) demonstrated that the quality of audited earnings is lower in the early first three years of rotation, relative to later years of auditor tenure, because rotation is costly and earnings quality improves with longer auditor tenure. One interpretation of this result is that mandatory rotation cannot be an efficient mechanism in Italy. In another study, Corbella et al. (2015) surveyed if higher audit fees are connected with audit firm rotation in Italy. Their findings suggested that, following audit firm rotation, the total amount of fees paid to the auditor was lower for firms audited by big auditors and unchanged for firms audited by a less well known auditor. Using a sample of 104 Chilean listed firms over seven years, Mahenthiran et al. (2020) show that a short audit partner tenure leads to the auditor not developing client-specific knowledge. Accordingly, mandatory audit partner rotation can strengthen auditor independence. To restore public trust in the auditing profession, the European Commission recently improved the audit market. According to a study conducted in Germany, Quick and Schmidt (2018) did not find a positive impact of the regulatory measures taken by the European Commission such as audit firm rotation on perceptions of auditor independence and audit quality. In the India setting, Narayanaswamy and Raghunandan (2019) concluded that mandatory audit firm rotation does not affect audit quality, audit costs, and audit market concentration. In the Iran market, Hassas Yeganeh et al. (2016) concluded that mandatory audit firm rotation (MAFR) has

caused a significant increase in audit fees. In other words, when the rotation of audit firms is mandatory, auditors need to perform longer audit hours to assess existing risks better and gain sufficient knowledge of their new client’s work environment, which in turn can increase the fees charged by independent auditors. Thus, based on the points mentioned in the research background, we anticipate the third hypothesis of this paper to be as follows:

Hypothesis 3 (H3). *The mandatory requirements of auditor’s rotation lead to higher audit fees.*

3. Research and Methodology

Because the results can be used in the decision-making process, this study is an applied study. The study population consists of 1030 observations and 103 companies listed on the TSE during the years 2003–2012. Based on econometric science, the unit root test is often used for investigating the real and stationary rates of all variables. After that, the variance inflation factor (VIF) is implied to identify the severity of multicollinearity in a regression analysis. A Student’s *t*-test is also used in this research. In the first phase, we utilize the F-Limer (Chow) test to find whether the model is fitted to the ordinary least squares (OLS) or panel data method. Following this, in the case of confirming the use of the panel data method, the Hausman test is used to determine whether panel data with fixed effects should be used or panel data with random effects. Finally, Durbin-Watson and Breusch-Godfrey tests are used to study the issue of serial autocorrelation among residuals.

3.1. Study Sample

The target population included all manufacturing firms listed on the TSE, during the period 2003 to 2012. Common features were considered for selecting the research sample. First of all, the type of company activity must be productive and therefore investment companies, leasing, credit, and financial institutions and banks are not included in the sample because of their different natures. These firms have quite different natures in terms of reporting on the TSE; therefore, such firms cannot be surveyed (Salehi et al. 2017, 2018b). Secondly, according to the research time, the firm should be listed on the TSE before the year 2003 and its name has not to be removed from the companies mentioned by the end of 2012. The activity of the selected firms also must not be stopped and their financial period from 2003 to 2012 must not be changed. As a result, taking account of the above conditions, a sample size of 103 firms on TSE has been selected.

3.2. Research Models

It should be noted that earnings management is categorized by two different groups namely accruals-based earnings management (AEM) and real earnings management (REM) (Schipper 1989; Chen 2016). In the first research model, discretionary accruals (DA) as a dependent variable is estimated using discretionary accruals following the modified Jones model (Jones 1991). Undoubtedly, this model is recognized to be the best of the best in the field of detecting earnings management among challenging models (Bartov et al. 2002; Yuan 2015; Chen 2016). In this model, we use a regression model to look at the impact of mandatory audit firm rotation on accruals-based earnings management.

$$DA_{it} = \beta_0 + \beta_1 \text{ Audit-Firm Rotation}_{it} + \beta_2 \text{ SIZE}_{it} + \beta_3 \text{ LEV}_{it} + \beta_4 \text{ BIG1}_{it} + \beta_5 \text{ CFO}_{it} + \beta_6 \text{ LOSS}_{it} + \beta_7 \text{ ROA}_{it} + \beta_8 \text{ MB}_{it} + \beta_9 \text{ SG}_{it} + \beta_{10} \text{ AGE}_{it} + \varepsilon_{it}. \text{ (Model 1)} \tag{1}$$

DA as a dependent variable equals the discretionary accruals calculated using the modified Jones model (Can 2019; Dao et al. 2019; Tarighi et al. 2022c). Hence, the modified Jones model is defined as follows:

$$DA_{it} = TAC_{it}/A_{it} - 1 = \beta_1 (1/A_{it} - 1) + \beta_2 (\Delta REV_{it}/A_{it} - 1) + \beta_3 (PPE_{it}/A_{it} - 1) + \varepsilon_{it}. \tag{2}$$

where TAC is total accruals; $A_{it}-1$ is beginning total asset for firm *i* in year *t*; ΔREV_{it} : change in revenue from year *t*-1 to years ($REV_t - REV_{t-1}$); PPE_{it} : gross property, plant,

and equipment in the year (Yuan 2015). Similar to the study of Narayanaswamy and Raghunandan (2019), we used discretionary accruals (DA) to measure audit quality. Audit firm rotation is defined as an independent variable (Ruiz-Barbadillo et al. 2009; Kighir 2013; Cicovic and Dhanoa 2016; Can 2019). In fact, this indicator variable equals one if the duration of the working relationship between the audit firm and the client is four years or less and zero otherwise. Moreover, the majority of these control variables have been selected consistent with previous studies, because preceding research shows that they affect the probability of fraudulent financial reporting. Firm size describes the natural logarithm of the total assets of the company, and LEV is measured via total liabilities divided by total assets (Ruiz-Barbadillo et al. 2009; Kighir 2013; Corbella et al. 2015; Cicovic and Dhanoa 2016; Salehi et al. 2018a; Bratten et al. 2019; Dao et al. 2019; Moradi et al. 2021). BIG1 equals one if the firm’s auditor is big and otherwise zero (Salehi et al. 2018a). CFO shows the ratio of cash flows from operation to lagged total assets; LOSS equals one if the firm has reported a loss and zero otherwise (Ruiz-Barbadillo et al. 2009; Kighir 2013; Corbella et al. 2015; Cicovic and Dhanoa 2016; Azizkhani et al. 2018; Salehi et al. 2018a; Dao et al. 2019). Return on assets (ROA) is evaluated by net income divided by average total assets (Dao et al. 2019; Arniati et al. 2019; Zimon et al. 2021); besides, the market to book ratio (MB) indicates total market capitalization to book value of equity (Corbella et al. 2015; Azizkhani et al. 2018; Salehi et al. 2018a). SG shows the company’s sales growth, and finally, the AGE variable specifies the number of years the firm has been listed on the exchange (Ruiz-Barbadillo et al. 2009; Kighir 2013; Cicovic and Dhanoa 2016; Azizkhani et al. 2018; Salehi et al. 2018a, 2018b; Bratten et al. 2019; Dao et al. 2019; Moradi et al. 2021; Tarighi et al. 2022c).

Even though accrual-based earnings management comprises GAAP choices (Tarighi et al. 2022c), real earnings management includes real activities manipulation (Cohen and Zarowin 2010; Chi et al. 2011; Hsu et al. 2013; Chen 2016). In the second model, we are going to know if mandatory audit firm rotation affects real earnings management (REM) in an emerging market called Iran. Thus, to reach this goal, the second model is designed as follows:

$$REM_{it} = \beta_0 + \beta_1 \text{ Audit-Firm Rotation}_{it} + \beta_2 \text{ SIZE}_{it} + \beta_3 \text{ LEV}_{it} + \beta_4 \text{ BIG1}_{it} + \beta_5 \text{ CFO}_{it} + \beta_6 \text{ LOSS}_{it} + \beta_7 \text{ ROA}_{it} + \beta_8 \text{ MB}_{it} + \beta_9 \text{ SG}_{it} + \beta_{10} \text{ AGE}_{it} + \varepsilon_{it}. \text{ (Model 2)} \tag{3}$$

REM is defined as another dependent variable. In this study, we measure profits manipulation from real activities using abnormal operational cash flows. Firstly, our regression of cash flows from operations on sales and change in sales through the model below is estimated for each firm.

$$CFO_{it}/TA_{it-1} = \beta_1 (1/TA_{it-1}) + \beta_2 (\text{Sales}_{it}/TA_{it-1}) + \beta_3 (\Delta\text{Sales}_{it}/TA_{it-1}) + \varepsilon \tag{4}$$

where CFO is cash flows from operation, and TA shows total assets at the beginning of the year. Sales and ΔSales show information about total sales and the change in sales, respectively. To identify abnormal operating cash flows, actual operating cash flows should be deducted from the normal operating cash flow level. The normal level of operating cash flow is estimated using regression coefficients of the previous relationship. Thirdly, the level of abnormal discretionary expenses can be defined as a linear function of sales of the same year. However, the use of sales of the same year in the regression equation will lead to a poor estimate of the normal level of the discretionary expenses since with increased sales, reported profits also increases. For example, an increase in sales by the company reduces unexpectedly the remainder of the deduction. To overcome this problem, discretionary expenses (the sum of advertising, R&D, and selling and administrative expenses) are estimated as a function of sales in the previous year. Following prior studies such as Roychowdhury (2006), Young et al. (2012), and Chen (2016), the normal level of discretionary expenses (DEXP) for companies is as follows:

$$DEXP/TA_{it-1} = \beta_1 (1/TA_{it-1}) + \beta_2 (\text{Sales}_{it}/TA_{it-1}) + \varepsilon t \tag{5}$$

Then, to calculate abnormal discretionary expenses (ABN-DEXP), actual discretionary expenses must be deducted from the normal level of discretionary expenses (Zimon et al. 2021). The normal level of the discretionary expenses is estimated using the regression coefficients of the previous relationship.

The purpose of the third research model is to investigate the effect of mandatory audit firm rotation on audit fees. Our dependent variable is the audit fee, which equals the natural logarithm of the total audit fee of the external auditor (Tarighi et al. 2022b). Henceforth, we established the third model of this research in the following way:

$$\text{Audit Fee}_{it} = \beta_0 + \beta_1 \text{ Audit-Firm Rotation}_{it} + \beta_2 \text{ SIZE}_{it} + \beta_3 \text{ LEV}_{it} + \beta_4 \text{ BIG1}_{it} + \beta_5 \text{ CFO}_{it} + \beta_6 \text{ LOSS}_{it} + \beta_7 \text{ ROA}_{it} + \beta_8 \text{ MB}_{it} + \beta_9 \text{ SG}_{it} + \beta_{10} \text{ AGE}_{it} + \varepsilon_{it} \text{ (Model 3)} \quad (6)$$

4. Results

4.1. Descriptive Statistics

Descriptive statistics are used to describe the basic features of the data in a study. To evaluate the data, the descriptive statistics including minimum, maximum, mean, median, and standard deviation are calculated and presented in the table below.

According to the results of Table 1, it can be seen that the highest amount of audit fees is 3.962, while the lowest is 1.919, which indicates that the difference between the audit fees received by the auditors in Iran is very high (Salehi et al. 2018b). In addition, the outcomes show that the average length of the working relationship between the auditor and the client has been over two years (2.46). For that reason, audit quality might have deteriorated and managers' motivation for financial fraud due to pressures from economic sanctions are likely to be increased concerning different significant factors such as traditional audit systems, lack of use of advanced technologies in audit firms, the intense price-based competition among auditors, and absence of experienced senior workforce (Azizkhani et al. 2018). Approximately one quarter of Iranian companies were audited by a big audit firm, and nearly 75% of the audit market is available to small audit firms, which is another sign of a drop in audit quality. Less than a tenth of Iranian companies reported losses at the end of their fiscal year, too. In addition, with respect to firm characteristics, on average, the size of sample firms is 5.958 (asset), with an average of 0.588 leverage (Lev) and an average of 0.146 operating cash flow scaled by lagged total assets (CFO). Around 0.08% of sample firms have a loss in the current year. On average, return on total assets (ROA), market-to-book ratio (MB), sales growth rate (SG), and listed year (Age) are 0.711, 2.665, 0.302, and 14.894 in turn. Each company, with an average of 15 years of experience in the stock market, is expected to hire an auditor that has been under its strategies.

Table 1. Descriptive statistics of quantitative variables.

Variable Name	Mean	S.D.	Maximum	Minimum
AEM	−0.045	0.288	4.582	−3.921
REM	0.002	0.147	0.497	−0.559
AUDIT FEE	2.816	0.324	3.962	1.919
SIZE	5.958	0.572	7.821	4.380
LEV	0.588	0.194	1.567	0.096
CFO	0.146	0.140	0.651	−0.301
ROA	0.711	5.298	121.114	−10.503
MB	2.665	1.894	14.666	0.007
SG	0.302	2.284	47.473	−0.999
AGE	14.894	7.516	49	5

Table 1. Cont.

Variable Name	Mean	S.D.	Maximum	Minimum
Descriptive statistics of qualitative variables				
	Status	Description	Frequency	Percentage
AUDITOR ROTATION	1	If the client-auditor relationship is four years or less	722	0.70
	0	If the client-auditor relationship is more than four years	308	0.30
BIG1	1	If a firm is audited by the auditing organization	279	0.27
	0	If a firm is not audited by the auditing organization	751	0.73
LOSS	1	If a firm has reported a loss	93	0.09
	0	If a firm has not reported a loss	937	0.91

Source: Own research.

4.2. Unit Root Test

In statistics, a unit root test tests whether a time series variable is non-stationary and possesses a unit root. The null hypothesis (H0) is generally defined as the presence of a unit root and the alternative hypothesis is stationary. Hence, we use both methods of augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) in this study, which have often been recognized among the most standard unit root tests (Zimon et al. 2021; Moradi et al. 2021; Tarighi et al. 2022a, 2022b, 2022c). The results of the unit root test are shown in Table 2.

Table 2. The results of the unit root test.

Variable	Augmented Dickey-Fuller (ADF)		Phillips-Perron (PP)	
	Statistic	p-Value	Statistic	p-Value
AEM	553.624	0.000 ***	16.016-	0.000 ***
REM	368.748	0.000 ***	6.891-	0.000 ***
AUDIT FEE	266.927	0.002 ***	-6.246	0.002 ***
AUDITOR ROTATION	362.515	0.000 ***	-6.589	0.000 ***
SIZE	374.250	0.000 ***	-5.811	0.000 ***
LEV	285.924	0.005 ***	-8.105	0.034 *
BIG1	26.9575	0.019 **	-7.756	0.039 *
CFO	338.800	0.000 ***	-4.589	0.000 ***
LOSS	26.5136	0.008 ***	-5.076	0.040 *
ROA	514.389	0.000 ***	10.703	0.000 ***
MB	324.444	0.000 ***	-3.219	0.000 ***
SG	767.507	0.001 ***	-36.938	0.000 ***
AGE	422.375	0.000 ***	-4.516	0.000 ***

Source: own research. Confidence level (**): 98%. Confidence level (*): 95%. Confidence level: 99% (***).

Building on the results of the unit root test, since the amount of *p*-value for all variables is less than 0.05%, we conclude that our research variables are stationary, which results in efficient regression and very accurate results. Therefore, we can suggest that all the variables of the paper are real and stationary and the use of OLS regression or panel data is not obstructed.

4.3. Multicollinearity Diagnostics

Multicollinearity is a phenomenon in which one predictor variable in multiple regression models can be linearly predicted from the others with a substantial degree of accuracy. In statistics, the variance inflation factor (VIF) evaluates the severity of multicollinearity in a regression analysis (Salehi et al. 2018b; Zimon et al. 2021; Tarighi et al. 2022a, 2022b).

As for the VIF, if the VIF of the estimated model coefficients is less than 10, there would be no linearity problem (Moradi et al. 2021; Zimon et al. 2021; Tarighi et al. 2022c). Based on Table 3, this value is less than 10 for all research models, which means that there is no linearity concerning the research hypotheses.

Table 3. Collinearity diagnostics test.

Variable	Collinearity Statistics	
	VIF	Tolerance
AUDITOR ROTATION	1.085	0.922
SIZE	1.062	0.941
LEV	1.255	0.797
BIG1	1.119	0.894
CFO	1.264	0.791
LOSS	1.090	0.918
ROA	1.035	0.966
MB	1.171	0.854
SG	1.028	0.973
AGE	1.023	0.977

Source: own research.

4.3.1. F-Limer (Chow) and Hausman Tests (Model 1)

In the initial step of econometrics, the F-Limer test is used for the sake of identifying whether the model is fitted to the ordinary least squares (OLS) or panel data method. The null hypothesis displays that there is no difference between the estimated coefficients for an individual cross-section and the estimated coefficient for individual mass. This implies that there is no necessity to estimate the model using the panel data (Salehi et al. 2018b; Tarighi et al. 2022a). After confirming the use of the panel data method, the Hausman test is used to decide whether panel data with fixed effects should be used or panel data with random effects (Tarighi et al. 2022a, 2022b). This test is formed based on the presence or absence of a correlation between the error of the regression and independent variables (Tarighi et al. 2022c). The random-effects model will be applied if such a relationship exists, and if it does not, the fixed effects model will be used. The statistic of the test will have a chi-square distribution with $k-1$ degrees of freedom if the calculated chi-square statistic is greater than the critical value. This means that the p -value of the test is less than 5%, and in this case, the null hypothesis is not accepted, and the fixed effects model is superior to the random-effects model.

As previously mentioned, the mandatory requirements of audit firm rotation in Iran were implemented in July 2007. Thus, between 2003 and 2007 (a five-year period) is considered as before the period of mandatory audit-firm rotation. In addition, from 2008 to 2012 is introduced as the time after compulsory requirements of audit firm rotation. The outcomes of Chow (F-limer) and Hausman tests in relation to the first model are shown in Table 4.

Based on the result of the Chow test, since the probability value of H_0 is more than 0.05, the ordinary least squares method is accepted for the before-requirements period, while panel data is acceptable in the post-requirements period due to the p -value of H_0 being less than five percent. In addition, after confirming the use of the panel data method for the period after legal requirements, the results of the Hausman test indicate that as the p -value of H_0 for the first model is 0.000 and less than 0.05, the first research model for the post-requirements period will be a model with fixed effects.

Table 4. F-limer and Hausman tests.

Time Period	Chow Test	Statistic	p-Value	Result
Before mandatory requirements (2003–2007)	Period F Period Chi-square	0.3332 1.0386	0.801 0.791	Pooled model (OLS) is acceptable
After mandatory requirements (2008–2012)	Period F Period Chi-square	3.6114 11.1207	0.0134 0.0111	Panel data is acceptable
Time Period	Hausman Test	Statistic	p-value	Result
After mandatory requirements (2008–2012)	Chi-Sq. Statistic	77.527	0.000	Fixed effects model is appropriate

4.3.2. Student’s T-Test of Model 1

The *t*-test is any statistical hypothesis test in which the test statistic follows a Student’s *t*-distribution under the null hypothesis. A *t*-test is most commonly applied when the test statistic would follow a normal distribution if the value of a scaling term in the test statistic was known. When the scaling term is unknown and is replaced by an estimate based on the data, the test statistics (under certain conditions) follow a Student’s *t*-distribution. The first assumption of the regression model is that the mean of the errors is zero. To determine this, a single-sample comparison test (T-Student) is used. In this test, the null hypothesis (H0) indicates no significant difference, whereas hypothesis one (H1) indicates a significant difference. Thus, the outputs of the Student’s *t*-test of the first model is demonstrated in Table 5.

Table 5. The results of the Student’s *t*-test.

Time Period	T-Statistics	p-Value	Result
(2003–2007)	5.21×10^{-18}	1.000	Errors average are close to zero
(2008–2012)	1.59×10^{-20}	1.000	Errors average are close to zero

In the statistics, if the model error has a significant difference with zero, the model specification should be reviewed. According to the results of the above table, a non-significant difference indicates that the mean of the model error sentence has no significant difference from zero and the first condition of the regression model is established.

4.3.3. Results of Model 1

The first model investigates the impact of mandatory requirements of audit firm rotation on accruals-based earnings management among Iranian firms. Hence, the results of parameter estimation for the first model are shown in Table 6.

What stands out from Table 6 is that the model is valid and trustworthy, and our model is quite a good fit. One of the most important assumptions in regression is that error sentences should not be correlated significantly (Zimon et al. 2021). Serial autocorrelation occurs when errors are correlated with each other. In statistics, Durbin-Watson and Breusch-Godfrey tests can be commonly used to examine the issue of serial autocorrelation among residuals (Savin and White 1977; Moradi et al. 2020). Building on the research literature, although Durbin-Watson can be employed to analyze the low level of serial autocorrelation (Lag 1) in residuals, the Breusch-Godfrey test is regarded to identify higher levels of serial autocorrelation (Lag 2) (Moradi et al. 2020). In general, since the figure of the Durbin-Watson test in this study is between 1.5 and 2.5, we can conclude that the error terms do not have serial autocorrelation (Lag 1). In addition, thanks to the *p*-value of more than 5% in the Breusch-Godfrey test, there is no problem with the serial autocorrelation (Lag 2) in the residuals.

Table 6. The results of the first model.

Variable	Before Mandatory Requirements (2003–2007)		After Mandatory Requirements (2008–2012)	
	Coefficient	p-Value	Coefficient	p-Value
C	0.1804	0.4359	−0.1153	0.2213
AUDITOR ROTATION	0.0025	0.8621	0.0122	0.0425 *
SIZE	0.0020	0.9491	0.0241	0.0597
LEV	−0.4017	0.0002 ***	−0.1490	0.0001 ***
BIG1	0.1185	0.0032 ***	−0.0162	0.3390
CFO	−1.0513	0.0000 ***	−0.7201	0.0002 ***
LOSS	−0.0702	0.3328	−0.0117	0.6481
ROA	−0.0041	0.8365	−0.0012	0.2096
MB	0.0379	0.0178 **	0.0287	0.0000 ***
SG	−0.0238	0.0001 ***	0.0745	0.0004 ***
AGE	0.0512	0.5111	−0.0267	0.4158

Model (2003–2007): F-statistic: 14.001, Prob F-statistic: 0.001, R-squared: 0.611, Durbin-Watson state: 1.97, Breusch-Godfrey test: 0.083, Model (2008–2012): F-statistic: 17.815, Prob F-statistic: 0.000, R-squared: 0.632, Durbin-Watson state: 1.83, Breusch-Godfrey test: 0.059. Confidence level (**): 98%. Confidence level (*): 95%. Confidence level 99% (***).

Our findings show that mandatory requirements of audit firm rotation deteriorate accruals-based earnings management significantly, which is inconsistent with the purpose of the agency theory. This means that the overall findings are consistent with the notion that mandatory auditors’ rotation is associated with enhanced accounting manipulation. Not only was this law in Iran not able to stop the opportunistic actions of management at a time when there were severe financial problems due to the economic sanctions, but this legal requirement provided more opportunities for executives wishing to manipulate the accounting figures. The reason for this result is quite clear, as was said before. Iran’s economic conditions are such that most executives are thirsty for managing profits (Salehi et al. 2018b; Tarighi et al. 2022a, 2022b). In this respect, a manipulative director is most unconstrained when the audit methods are more foreseeable in Iran’s audit market. Consequently, it is interpreted that misstated financial reports are less likely in the early years of audit firm tenure (Azizkhani et al. 2018). When the statutory audit period is four consecutive years, it can be logically expected that the likelihood of engaging in earnings management is more in the long years of audit firm tenure. Looking at the control variables, we also understand that cash flows from operation (CFO), financial leverage (LEV), and return on assets (ROA) have a negative effect on AEM for before and after mandatory requirements. However, although the sales growth rate of a firm (SG) in the period before mandatory requirements has an adverse effect on AEM, the results are quite the reverse in the years after the legal requirements.

4.3.4. F-Limer (Chow) Test (Model 2)

The outcomes of the Chow test concerning the second research model are shown in Table 7.

Table 7. F-limer test.

Time Period	Chow Test	Statistic	p-Value	Result
Before mandatory requirements (2003–2007)	Period F	0.3332	0.801	OLS model is acceptable
	Chi-square	1.0386	0.791	
After mandatory requirements (2008–2012)	Period F	3.6114	0.0134	OLS model is acceptable
	Chi-square	11.1207	0.0111	

The most important point about Table 7 is that because the results of the F-limer (Chow) test showed that the common effect model (pooled pattern) is appropriate for both the preceding and subsequent periods of mandatory requirements, there is no need to carry out the Hausman test.

4.3.5. Student’s T-Test of Model 2

The results of the comparison of the mean of error sentences for the second research model are shown in Table 8.

Table 8. The results of the Student’s *t*-test.

Time Period	T-Statistics	<i>p</i> -Value	Result
(2003–2007)	-1.30×10^{-17}	1.000	Errors average are close to zero
(2008–2012)	-4.09×10^{-18}	1.000	Errors average are close to zero

The non-significance of the *t*-statistic indicates that the error mean of the second model is not significantly different from zero and the first condition of the regression model is met.

4.3.6. Results of Model 2

The second model aims to study the impact of mandatory requirements of audit firm rotation on real earnings management among Iranian firms. Therefore, the results of this model are shown in Table 9.

Table 9. The results of the second model.

Variable	Before Mandatory Requirements (2003–2007)		After Mandatory Requirements (2008–2012)	
	Coefficient	<i>p</i> -Value	Coefficient	<i>p</i> -Value
C	−0.2867	0.0000 ***	−0.3189	0.0000 ***
AUDITOR ROTATION	−0.0038	0.0497 *	−0.0031	0.1607
SIZE	0.0359	0.0000 ***	0.0351	0.0001 ***
LEV	−0.0669	0.0000 ***	−0.0664	0.0000 ***
BIG1	−0.0094	0.0854	0.0008	0.8909
CFO	0.9729	0.0003 ***	0.9198	0.0180 **
LOSS	−0.0027	0.7795	−0.0105	0.2668
ROA	−0.0002	0.9173	-8.70×10^{-5}	0.8074
MB	0.0002	0.9097	0.0013	0.2665
SG	−0.0012	0.0954	−0.0335	0.0000 ***
AGE	−0.0064	0.5475	−0.0033	0.7835

Model (2003–2007): F-statistic: 278.795 Prob F-statistic: 0.000, R-squared: 0.769, Durbin-Watson state: 2.07, Breusch-Godfrey test: 0.116, Model (2008–2012): F-statistic: 316.693, Prob F-statistic: 0.000, R-squared: 0.784, Durbin-Watson state: 1.97, Breusch-Godfrey test: 0.093. Confidence level (**): 98%. Confidence level (*): 95%. Confidence level 99% (***).

Regarding the second hypothesis, we found that obligatory requirements of audit firm rotations were not able to affect real earnings management in the Iran context. In other words, the existence of this rule by Iranian governmental authorities is not an efficient mechanism to stop earnings management.

4.3.7. F-Limer (Chow) and Hausman Tests (Model 3)

The results of Chow and Hausman tests about the latest research model are presented in Table 10.

Table 10. F-limer and Hausman tests.

Time Period	Chow Test	Statistic	p-Value	Result
Before mandatory requirements (2003–2007)	Period F	5.7550	0.0007	Panel data is acceptable
	Period Chi-square	17.5845	0.0005	
After mandatory requirements (2008–2012)	Period F	3.4146	0.0175	Panel data is acceptable
	Period Chi-square	10.5224	0.0146	
Time Period	Hausman Test	Statistic	p-Value	Result
Before mandatory requirements (2003–2007)	Chi-Sq. Statistic	0.000	1.000	Random Effects Model is appropriate
After mandatory requirements (2008–2012)	Chi-Sq. Statistic	0.000	1.000	Random Effects Model is appropriate

The results show that the panel data pattern is superior to the common effect pattern (OLS model) for both periods. After confirming the use of the panel data pattern, this study using the Hausman test proves that owing to the *p*-value of H0 being one and more than 0.05, panel data with random effects is more suitable for both time periods.

4.3.8. Student’s *T*-Test of Model 3

The outcomes of the Student’s *t*-test for the last research model are demonstrated in Table 11.

Table 11. The results of the Student’s *t*-test.

Time Period	T-Statistics	p-Value	Result
(2003–2007)	3.48×10^{-6}	1.000	Errors average are close to zero
(2008–2012)	-2.09×10^{-16}	1.000	Errors average are close to zero

As with previous models of this study, the result clearly shows that the error mean of the third model does not differ significantly from zero.

4.3.9. Results of Model 3

The target of the third model is exploring the influence of mandatory requirements of audit firm rotation on audit fees charged by external auditors. Consequently, the results related to this model are shown in Table 12.

As regards the results obtained from Table 12, it can be said that mandatory requirements of audit firm rotation did not have a significant influence on audit fees. To put it another way, the existence of this mandatory law from Iran’s SEO was not effective in reducing agency problems. In addition, the results also show that larger companies have paid more audit fees.

Table 12. The results of the third model.

Variable	Before Mandatory Requirements (2003–2007)		After Mandatory Requirements (2008–2012)	
	Coefficient	p-Value	Coefficient	p-Value
C	1.0844	0.0000 ***	1.5347	0.0000 ***
AUDITOR ROTATION	−0.0234	0.0230 *	0.0033	0.7673
SIZE	0.2707	0.0000 ***	0.2073	0.0168 **
LEV	−0.1226	0.1065	−0.0210	0.7623
BIG1	0.0373	0.1895	0.0077	0.8070
CFO	−0.0825	0.4082	−0.0428	0.6762
LOSS	0.0301	0.5586	−0.0377	0.4315
ROA	0.0074	0.6073	0.0010	0.5449
MB	0.0118	0.2011	0.0048	0.4352
SG	0.0006	0.8597	−0.0594	0.1150
AGE	0.0826	0.1369	0.0773	0.2046

Model (2003–2007): F-statistic: 17.239, Prob F-statistic: 0.000, R-squared: 0.518, Durbin-Watson state: 1.75, Breusch-Godfrey test: 0.091, Model (2008–2012): F-statistic: 14.754, Prob F-statistic: 0.002, R-squared: 0.540, Durbin-Watson state: 1.54, Breusch-Godfrey test: 0.061. Confidence level (**): 98%. Confidence level (*): 95%. Confidence level 99% (***).

5. Conclusions

The purpose of the paper was to determine if compulsory requirements of audit firm circulation could affect earnings management and audit fees in a market facing financial problems due to pressures from economic sanctions. The results displayed that the rule of mandatory audit firm rotation increased accruals-based earnings management significantly. In addition, the outcomes demonstrated that mandatory requirements of audit firm rotation did not have a significant influence on real earnings management and audit fees. Overall, our findings proved that the mandatory requirements of audit firm rotation in Iran were not able to prevent the opportunistic actions of management at a time when they were faced with severe financial problems because of economic sanctions. Achieving such results in this study is not far from the reality of the Iranian market. Lawmakers actually seem to have not paid much attention to Iran’s audit market infrastructure and nature. It is argued that many factors such as less willingness to train and oversight of auditors, lack of a bonus and punishment system for audit quality, and weak financial condition of audit firms can result in moderately low levels of auditor objectivity or audit quality (Azizkhani et al. 2018). The presence of such features in the infrastructure of the Iranian audit market has led to a lack of risk-based audits; as a result, managers will have more opportunities to take fraudulent activities when the predictability of incumbent auditors’ programs is easy for executives. According to this key point, when the change in auditors takes place in the early years, it can be expected that the audit is least predictable and Iranian managers are more constrained to manipulate financial reports. The average working relationship between an auditor and a client in Iran is over two years, which has led many of the audit methods for managers to be foreseeable and managers have more courage to commit financial fraud. It should be noted that the results of our study actually are consistent with Geiger and Raghunandan (2002), Johnson et al. (2002), Myers et al. (2003), Carcello and Nagy (2004), Ghosh and Moon (2005), and Azizkhani et al. (2018), whereas they are not similar to the studies of Hamilton et al. (2005), Carey and Simnett (2006), Chi and Huang (2005), Gates et al. (2007), and Alhadab and Clacher (2018).

Without any exaggeration, this research will make investors and others aware of the fact that mandatory audit firm rotation might be not effective in reducing the financial misreporting and the agency problems in emerging markets, particularly those markets struggling with financial sanctions like Iran. This paper shows that when firms have financial distress and the audit is very predictable, many regulatory mechanisms such as audit firm rotation after several years do not have a deterrent role. In fact, the findings of

this study give lawmakers a serious warning that the length of an audit firm's tenure should be based on the characteristics of the audit market structure of each country. Otherwise, it may act as a sharp double-edged sword and have very bad consequences for a market.

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References

- Alhadab, Mohammad, and Iain Clacher. 2018. The impact of audit quality on real and accrual earnings management around IPOs. *The British Accounting Review* 50: 442–61. [\[CrossRef\]](#)
- Alzoubi, Ebraheem Saleem Salem. 2018. Audit quality, debt financing, and earnings management: Evidence from Jordan. *Journal of International Accounting, Auditing and Taxation* 30: 69–84. [\[CrossRef\]](#)
- Ameer, Rashid, and Rashidah Abdul Rahman. 2009. The Impact of Minority Shareholder Watchdog Group Activism on the Performance of Targeted Firms in Malaysia. *Asian Academy of Management Journal of Accounting & Finance* 5: 67–92.
- Arens, Alvin A., Randal J. Elder, Mark S. Beasley, and Chris E. Hogan. 2016. *Auditing and Assurance Services*. Upper Saddle River: Pearson Education, ISBN 0134067118/9780134067117.
- Arniati, Tutik, Dyah Aruning Puspita, Aminul Amin, and Kashan Pirzada. 2019. The implementation of good corporate governance model and auditor independence in earnings' quality improvement. *Entrepreneurship and Sustainability Issues* 7: 188. [\[CrossRef\]](#)
- Azizkhani, Masoud, Reza Daghani, and Greg Shailer. 2018. Audit firm tenure and audit quality in a constrained market. *The International Journal of Accounting* 53: 167–82. [\[CrossRef\]](#)
- Bagherpour, Mohammad A., Gary S. Monroe, and Greg Shailer. 2014. Government and managerial influence on auditor switching under partial privatization. *Journal of Accounting and Public Policy* 33: 372–90. [\[CrossRef\]](#)
- Ball, Fiona, Jonathan Tyler, and Peter Wells. 2015. Is audit quality impacted by auditor relationships? *Journal of Contemporary Accounting & Economics* 11: 166–81. [\[CrossRef\]](#)
- Bamahros, Hasan Mohammed, and Wan Nordin Wan Hussin. 2015. Non-audit services, audit firm tenure and earnings management in Malaysia. *Asian Academy of Management Journal of Accounting and Finance* 11: 145–68.
- Bandyopadhyay, Sati P., Changling Chen, and Yingmin Yu. 2014. Mandatory audit partner rotation, audit market concentration, and audit quality: Evidence from China. *Advances in Accounting* 30: 18–31. [\[CrossRef\]](#)
- Bartov, Eli, Dan Givoly, and Carla Hayn. 2002. The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics* 33: 173–204. [\[CrossRef\]](#)
- Bates, Homer L., Robert W. Ingram, and Philip MJ Reckers. 1982. Auditor-client affiliation: The impact on "materiality". *Journal of Accountancy (pre-1986)* 153: 60.
- Bratten, Brian, Monika Causholli, and Thomas C. Omer. 2019. Audit firm tenure, bank complexity, and financial reporting quality. *Contemporary Accounting Research* 36: 295–325. [\[CrossRef\]](#)
- Cameran, Mara, Jere R. Francis, Antonio Marra, and Angela Pettinicchio. 2015. Are there adverse consequences of mandatory auditor rotation? Evidence from the Italian experience. *Auditing: A Journal of Practice & Theory* 34: 1–24. [\[CrossRef\]](#)
- Can, Gokberk. 2019. The Impact of Auditor Qualifications on Earnings Management of Companies Listed on the Borsa Istanbul Industrial Index. *Business and Economics Research Journal* 10: 373–90. [\[CrossRef\]](#)
- Carcello, Joseph V., and Albert L. Nagy. 2004. Audit firm tenure and fraudulent financial reporting. *Auditing: A Journal of Practice & Theory* 23: 55–69. [\[CrossRef\]](#)
- Carey, Peter, and Roger Simnett. 2006. Audit partner tenure and audit quality. *The Accounting Review* 81: 653–76. [\[CrossRef\]](#)
- Chen, Chieh-Shuo. 2016. The effect of mandatory disclosure requirements and disclosure types of auditor fees on earnings management: Evidence from Taiwan. *Asia Pacific Management Review* 21: 181–95. [\[CrossRef\]](#)
- Chi, Wuchun. 2011. An overlooked effect of mandatory audit-firm rotation on investigation strategies. *OR Spectrum* 33: 265–85. [\[CrossRef\]](#)
- Chi, Wuchun, and Huichi Huang. 2005. Discretionary accruals, audit-firm tenure and audit-partner tenure: Empirical evidence from Taiwan. *Journal of Contemporary Accounting & Economics* 1: 65–92. [\[CrossRef\]](#)
- Chi, Wuchun, Ling Lei Lisic, and Mikhail Pevzner. 2011. Is enhanced audit quality associated with greater real earnings management? *Accounting Horizons* 25: 315–35. [\[CrossRef\]](#)

- Choi, J. H., and R. Doogar. 2005. *Auditor Tenure and Audit Quality: Evidence from Goingconcern Qualifications Issued during 1996–2001*. Working Paper. Hong Kong: Hong Kong University of Science and Technology, University of Illinois at Urbana-Champaign.
- Chung, Hyeesoo Hyun. 2004. *Selective Mandatory Auditor Rotation and Audit Quality: An Empirical Investigation of Auditor Designation Policy in Korea*. West Lafayette: Purdue University.
- Cicovic, Tatjana, and Samandeeep Dhanoa. 2016. Audit firm Rotation: Could the Concept Enhance an Auditor's Independence? Master's thesis, Department of Business Studies, Uppsala University, Uppsala, Switzerland.
- Cohen, Daniel A., and Paul Zarowin. 2010. Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics* 50: 2–19. [\[CrossRef\]](#)
- Copley, Paul A., and Mary S. Doucet. 1993. Auditor tenure, fixed fee contracts, and the supply of substandard single audits. *Public Budgeting & Finance* 13: 23–35. [\[CrossRef\]](#)
- Corbella, Silvano, Cristina Florio, Giorgio Gotti, and Stacy A. Mastroli. 2015. Audit firm rotation, audit fees and audit quality: The experience of Italian public companies. *Journal of International Accounting, Auditing and Taxation* 25: 46–66. [\[CrossRef\]](#)
- Daniels, Bobbie W., and Quinton Booker. 2011. The effects of audit firm rotation on perceived auditor independence and audit quality. *Research in Accounting Regulation* 23: 78–82. [\[CrossRef\]](#)
- Dao, Mai, Hongkang Xu, and Long Liu. 2019. Impact of the disclosure of audit engagement partners on audit quality: Evidence from the USA. *International Journal of Auditing* 23: 112–24. [\[CrossRef\]](#)
- Davis, Larry R., Billy Soo, and Greg Trompeter. 2002. *Auditor Tenure, Auditor Independence and Earnings Management*. Documento de trabalho. Boston: Boston College.
- El Guindy, Medhat N., and Mohamed AK Basuony. 2018. Audit firm tenure and earnings management: The impact of changing accounting standards in UK firms. *The Journal of Developing Areas* 52: 167–81. [\[CrossRef\]](#)
- Escaloni, Susana, and Mercedes Mareque. 2021. Audit Report Lag. Differential Analysis between Spanish SMEs and Non-SMEs. *Sustainability* 13: 12830. [\[CrossRef\]](#)
- Fargher, Neil, Ho-Young Lee, and Vivek Mande. 2008. The effect of audit partner tenure on client managers' accounting discretion. *Managerial Auditing Journal* 23: 161–86. [\[CrossRef\]](#)
- Firth, Michael, Oliver M. Rui, and Xi Wu. 2012. How do various forms of auditor rotation affect audit quality? Evidence from China. *The International Journal of Accounting* 47: 109–38. [\[CrossRef\]](#)
- Gates, Sandra K., D. Jordan Lowe, and Philip MJ Reckers. 2007. Restoring public confidence in capital markets through auditor rotation. *Managerial Auditing Journal* 22: 5–17. [\[CrossRef\]](#)
- Geiger, Marshall A., and Kannan Raghunandan. 2002. Auditor tenure and audit reporting failures. *Auditing: A Journal of Practice & Theory* 21: 67–78. [\[CrossRef\]](#)
- Ghosh, Aloke, and Doocheol Moon. 2005. Auditor tenure and perceptions of audit quality. *The Accounting Review* 80: 585–612. [\[CrossRef\]](#)
- Griffiths, Phil. 2016. *Risk-Based Auditing*. London: Routledge. [\[CrossRef\]](#)
- Hamilton, Jane, Caitlin Ruddock, Donald J. Stokes, and Stephen L. Taylor. 2005. Audit partner rotation, earnings quality and earnings conservatism. *Earnings Quality and Earnings Conservatism* 42. [\[CrossRef\]](#)
- Harris, Kathleen. 2012. *Mandatory Audit Rotation: An International Investigation*. Houston: University of Houston.
- Hassas Yeganeh, Yahya, Farokh Barzideh, Mohammad Taghi Taghavifard, and Muhammad Farahmand Seyed Abadi. 2016. Investigating the impact of mandatory audit firm rotation on audit fee and audit market competition. *Accounting and Auditing Review* 23: 333–52. [\[CrossRef\]](#)
- Hsu, Y. S., H. C. Chen, and W. C. Chen. 2013. The impact of board characteristics on the choice of earnings management. *Journal of Accounting Review* 57: 1–33.
- Jensen, Michael C., and William H. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3: 305–60. [\[CrossRef\]](#)
- Johnson, Van E., Inder K. Khurana, and J. Kenneth Reynolds. 2002. Audit-firm tenure and the quality of financial reports. *Contemporary Accounting Research* 19: 637–60. [\[CrossRef\]](#)
- Jones, Jennifer J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29: 193–228. [\[CrossRef\]](#)
- Karami, Gholamreza, Ameneh Bazrafshan, and Amir Mohammadi. 2011. Auditor tenure and earnings management. *Journal of Knowledge Accounting* 2: 65–82. [\[CrossRef\]](#)
- Kighir, Apedzan Emmanuel. 2013. Mandatory audit firm rotation and auditor independence: Empirical evidence from Nigerian listed banks. *International Journal of Auditing Technology* 1: 5–17. [\[CrossRef\]](#)
- Kim, Suyon. 2021. Does Engagement Partners' Effort Affect Audit Quality? With a Focus on the Effects of Internal Control System. *Risks* 9: 225. [\[CrossRef\]](#)
- Kim, J. B., and C. H. Yi. 2006. *Does Auditor Rotation Improve Audit Quality in Emerging Markets? Korean Evidence*. Working Paper. Montreal: Concordia University and Hong Kong Polytechnic University.
- Kim, Sook Min, Seon Mi Kim, Dong Heun Lee, and Seung Weon Yoo. 2019. How investors perceive mandatory audit firm rotation in Korea. *Sustainability* 11: 1089. [\[CrossRef\]](#)
- Kwon, Soo Young, Youngdeok Lim, and Roger Simnett. 2014. The effect of mandatory audit firm rotation on audit quality and audit fees: Empirical evidence from the Korean audit market. *Auditing: A Journal of Practice & Theory* 33: 167–96. [\[CrossRef\]](#)
- Levitt Jr, Arthur. 1998. The numbers game. *The CPA Journal* 68: 14.

- Li, Dan. 2007. *Auditor Tenure and Accounting Conservatism*. Atlanta: Georgia Institute of Technology.
- Lukason, Oliver, and María-del-Mar Camacho-Miñano. 2019. Bankruptcy Risk, Its Financial Determinants and Reporting Delays: Do Managers Have Anything to Hide? *Risks* 7: 77. [CrossRef]
- Lukason, Oliver, and María-del-Mar Camacho-Miñano. 2021. What Best Explains Reporting Delays? A SME Population Level Study of Different Factors. *Sustainability* 13: 4663. [CrossRef]
- Mahenthiran, Sakthi, Berta Silva Palavecinos, and De La Fuente-Mella. 2020. The effect of board links, audit partner tenure, and related party transactions on misstatements: Evidence from Chile. *International Journal of Financial Studies* 8: 78. [CrossRef]
- Mahmudi, M. 2010. Going concern audit report and litigation against auditor. *CPA Journal* 10: 79–87.
- Moradi, Mahdi, Mahdi Salehi, Hossein Tarighi, and Mahdi Saravani. 2020. Audit adjustments and corporate financing: Evidence from Iran. *Journal of Accounting in Emerging Economies* 10: 521–43. [CrossRef]
- Moradi, Mahdi, Andrea Appolloni, Grzegorz Zimon, Hossein Tarighi, and Maede Kamali. 2021. Macroeconomic Factors and Stock Price Crash Risk: Do Managers Withhold Bad News in the Crisis-Ridden Iran Market? *Sustainability* 13: 3688. [CrossRef]
- Myers, James N., Linda A. Myers, and Thomas C. Omer. 2003. Exploring the term of the auditor-client relationship and the quality of earnings: A case for mandatory auditor rotation? *The Accounting Review* 78: 779–99. [CrossRef]
- Narayanawamy, Ramaswami, and Kannan Raghunandan. 2019. The effect of mandatory audit firm rotation on audit quality, audit fees and audit market concentration: Evidence from India. *IIM Bangalore Research Paper*. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3360256 (accessed on 5 February 2022).
- Okegbe, Theophilus O., Jerry Okechukwu Ojimadu, Jerry Chukwuebuka Orajekwe, and Francis Chinedu Egbunike. 2019. Auditor Independence and Audit Quality: Empirical Evidence from Quoted Oil and Gas Firms in Nigeria. *Journal of Global Accounting Department of Accountancy* 6: 75–87.
- Pucheta-Martínez, Maria Consuelo, and Cristina De Fuentes. 2007. The impact of audit committee characteristics on the enhancement of the quality of financial reporting: An empirical study in the Spanish context. *Corporate Governance: An International Review* 15: 1394–412. [CrossRef]
- Quick, Reiner, and Florian Schmidt. 2018. Do audit firm rotation, auditor retention, and joint audits matter?—An experimental investigation of bank directors’ and institutional investors’ perceptions. *Journal of Accounting Literature* 41: 1–21. [CrossRef]
- Rahmina, Listya Yuniastuti, and Sukrisno Agoes. 2014. Influence of auditor independence, audit tenure, and audit fee on audit quality of members of capital market accountant forum in Indonesia. *Procedia-Social and Behavioral Sciences* 164: 324–31. [CrossRef]
- Roychowdhury, Sugata. 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics* 42: 335–70. [CrossRef]
- Ruiz-Barbadillo, Emiliano, Nieves Go’mez-Aguilar, and Nieves Carrera. 2009. Does mandatory audit firm rotation enhance auditor independence? Evidence from Spain. *Auditing: A Journal of Practice & Theory* 28: 113–35. [CrossRef]
- Salehi, Mahdi, Hossein Tarighi, and Malihe Rezaezhad. 2017. The relationship between board of directors’ structure and company ownership with corporate social responsibility disclosure: Iranian angle. *Humanomics* 33: 398–418. [CrossRef]
- Salehi, Mahdi, Hossein Tarighi, and Haydar Sahebkar. 2018a. The impact of auditor conservatism on accruals and going concern opinion: Iranian angle. *International Journal of Islamic and Middle Eastern Finance and Management* 11: 650–66. [CrossRef]
- Salehi, Mahdi, Hossein Tarighi, and Samaneh Safdari. 2018b. The relation between corporate governance mechanisms, executive compensation and audit fees: Evidence from Iran. *Management Research Review* 41: 939–67. [CrossRef]
- Savin, Nathan E., and Kenneth J. White. 1977. The Durbin-Watson test for serial correlation with extreme sample sizes or many regressors. *Econometrica: Journal of the Econometric Society* 45: 1989–96. Available online: <https://www.jstor.org/stable/1914122> (accessed on 5 February 2022). [CrossRef]
- Schipper, Katherine. 1989. Earnings management. *Accounting Horizons* 3: 91.
- Tarighi, Hossein, Andrea Appolloni, Ali Shirzad, and Abdullah Azad. 2022a. Corporate Social Responsibility Disclosure (CSRD) and Financial Distressed Risk (FDR): Does Institutional Ownership Matter? *Sustainability* 14: 742. [CrossRef]
- Tarighi, Hossein, Mahdi Salehi, Mahdi Moradi, and Grzegorz Zimon. 2022b. Social Capital, Intellectual Capital, and Audit Fee: Conflicting Evidence from Iran. *Economies* 10: 39. [CrossRef]
- Tarighi, Hossein, Zeynab N. Hosseiny, Mohammad R. Abbaszadeh, Grzegorz Zimon, and Darya Haghghat. 2022c. How Do Financial Distress Risk and Related Party Transactions Affect Financial Reporting Quality? Empirical Evidence from Iran. *Risks* 10: 46. [CrossRef]
- Vanstraelen, Ann. 2000. Impact of renewable long-term audit mandates on audit quality. *European Accounting Review* 9: 419–42. [CrossRef]
- Wahab, Effiezal A. Abdul, Janice CY How, and Peter Verhoeven. 2007. The impact of the Malaysian code on corporate governance: Compliance, institutional investors and stock performance. *Journal of Contemporary Accounting & Economics* 3: 106–29. [CrossRef]
- Young, Chaur-Shiuh, Tsai Liu-Ching, Chen Chia-Hui, and Ssu-Ting Liao. 2012. Board characteristics and real earnings management. *Tai Da Guan Li Lun Cong* 23: 363. [CrossRef]
- Yuan, Tangmei. 2015. Type of Earnings Management and Different Economic Consequences. In *International Conference on Logistics Engineering, Management and Computer Science*. Available online: <https://www.atlantis-press.com/proceedings/lemcs-15/25838411> (accessed on 5 February 2022).

- Zimon, Grzegorz, Andrea Appolloni, Hossein Tarighi, Seyedmohammadali Shahmohammadi, and Ebrahim Daneshpou. 2021. Earnings Management, Related Party Transactions and Corporate Performance: The Moderating Role of Internal Control. *Risks* 9: 146. [[CrossRef](#)]
- Zureigat, Qasim Mohammad. 2011. The effect of ownership structure on audit quality: Evidence from Jordan. *International Journal of Business and Social Science* 2: 38–46.