Readability of auditor reports: does audit market competition matter? Empirical evidence from Iran

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Abstract

Purpose – While existing research explores the impact of audit market competition on audit fees and audit quality, there is limited investigation into how competition in the audit market influences auditors' writing style. This study examines the relationship between audit market competition and the readability of audit reports in Iran, where competition is particularly intense, especially among private audit firms.

Design/methodology/approach – The sample comprises 1,050 firm-year observations in Iran from 2012 to 2018. Readability measures, including the *Fog* index, Flesch-Reading-Ease (*FRE*) and Simple Measure of Gobbledygook (*SMOG*), are employed to assess the readability of auditors' reports. The Herfindahl–Hirschman Index (HHI) is utilized to measure audit market competition, with lower index values indicating higher auditor competition. The concentration measure is multiplied by −1 to obtain the competition measure (*AudComp*). Alternative readability measures, such as the Flesch–Kincaid (*FK*) and Automated Readability Index (*ARI*) are used in additional robustness tests. Data on textual features of audit reports, auditor characteristics and other control variables are manually collected from annual reports of firms listed on the Tehran Stock Exchange (TSE).

Findings – The regression analysis results indicate a significant and positive association between audit market competition and audit report readability. Furthermore, a stronger positive and significant association is observed among private audit firms, where competition is more intense compared to state audit firms. These findings remain robust when using alternative readability measures and other sensitivity checks. Additional analysis reveals that the positive effect of competition on audit report readability is more pronounced in situations where the auditor remains unchanged and the audit market size is small.

Originality/value – This paper expands the existing literature by examining the impact of audit market competition on audit report readability. It focuses on a unique audit market (Iran), where competition among audit firms is more intense than in developed countries due to the liberalization of the Iranian audit market in 2001 and the establishment of numerous private audit firms.

Keywords Audit market competition, Audit reports readability, Fog index, Emerging markets

Paper type Research paper

1. Introduction

Readability, an indicator of financial reporting quality (Biddle *et al.*, 2009), is compromised by verbosity and overly technical writing, resulting in reading difficulties due to length and content

JEL Classification — M41, M42

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complexity. The Statement of Financial Accounting Concepts (SFAC) posits that accounting information "cannot be useful to decision-makers who cannot understand it, even though it may otherwise be relevant to a decision and be reliable." For financial disclosures to be understandable, they must be readable. Research on readability highlights the significance of the non-numerical aspect of corporate reporting—the textual-linguistic component—and its impact on investor decisions (Asay *et al.*, 2017), financial analysts (Lehavy *et al.*, 2011) and informational efficiency (Hesarzadeh and Rajabalizadeh, 2019). However, existing studies on readability have not thoroughly examined the textual features of audit reports as another source of financial information within corporate reporting (Pound, 1981; Smith, 2019; Fakhfakh, 2016; Zeng *et al.*, 2021). Readability serves as a measure of financial information quality by examining the performance of written information and the effectiveness of financial communication instruments from a linguistic perspective (Fakhfakh, 2016). Evidence suggests that more informative and firm-specific audit reports may signify substantial audit effort or auditors' commitment to quality audits. In this context, Zeng *et al.* (2021) analyzed the wording of audit reports, demonstrating that disclosure characteristics such as specificity, similarity, readability and length indicate auditors' concerns regarding clients' earnings quality, audit effort and the propensity to issue modified opinions.

Although evidence indicates that audit firms in concentrated markets tend to provide the best audits, regulators and market participants have expressed concerns that audit quality may be compromised in such markets (Newton *et al.*, 2013). This paper aims to empirically address this issue by exploring the impact of competition among audit firms in Iran's local market on the readability of audit reports, a sign of audit quality that reflects the quality of services provided by auditors to their clients. Numerous studies have examined the effect of audit market concentration on audit quality, yielding mixed results (Sanders *et al.*, 1995; Willekens and Achmadi, 2003; Kallapur *et al.*, 2010; Boone *et al.*, 2012; Carson *et al.*, 2012; Numan and Willekens, 2012; Newton *et al.*, 2013; Huang *et al.*, 2016; Eshleman and Lawson, 2017). Despite the inconclusive evidence regarding the consequences of concentration and the lack of competition in audit markets, policymakers in various countries, particularly developed ones, have expressed concerns over the potential effects of concentration in audit markets over the past two decades (e.g. General Accounting Office (GAO), 2003, 2008; European Commission, 2010). The primary concern is that higher audit market concentration could threaten high-quality audits and efficient pricing (Raak *et al.*, 2020). Essentially, the worry is that concentration narrows clients' choices for audit service providers, bolsters auditors' market power and fosters complacency among auditors, leading to lower audit quality (Huang *et al.*, 2016). However, some researchers argue that audit market concentration is likely associated with higher audit quality. For instance, a higher degree of audit market concentration may reduce auditors' concerns about client loss, allowing them to focus on quality improvement (Newton *et al.*, 2013). Moreover, higher concentration could benefit clients due to economies of scale and increased auditor expertise in relevant industries (Pearson and Trompeter, 1994; Abidin *et al.*, 2010).

Building on the aforementioned arguments, this study investigates the impact of audit market competition on an aspect of audit quality, specifically, the readability of audit reports in the Iranian audit market. This market is characterized by intense competition due to the liberalization of the Iranian audit market in 2001 (MohammadRezaei and Mohd-Saleh, 2018) and a relatively weak legal environment compared to developed countries. Before 2001, the Iranian Audit Organization (IAO), a governmental audit firm, monopolized the Iranian audit market. The privatization and establishment of the Iranian Association of Certified Public Accountants (IACPA) in 2001 led to the creation of numerous private audit firms. Consequently, the IAO's unilateral monopoly was dissolved, resulting in a significant decrease in market share (to less than one-third) and heightened competition in the Iranian audit services market (Azizkhani *et al.*, 2012; MohammadRezaei and Mohd-Saleh, 2017). By December 2019, over 250 private audit firms were listed by the IACPA. Additionally, the

audit market in Iran is marked by low litigation risk, the absence of international audit firms, high ownership concentration, relatively weak monitoring mechanisms and underdeveloped corporate governance practices (Oradi *et al.*, 2020; Azizkhani *et al.*, 2018). Collectively, the intense competition in the Iranian audit market presents a valuable opportunity to directly examine the influence of audit market competition on audit report readability.

This paper analyzes a sample of 1,050 firm-year observations of Iranian firms listed on the TSE between 2012 and 2018. Following prior research (Kallapur *et al.*, 2010; Boone *et al.*, 2012), the HHI is employed to measure competition, which has been tested in previous studies of the Iranian audit market (MohammadRezaei and Mohd-Saleh, 2018). This metric captures variations in the number of audit firms in a local market and the distribution of audit clients among those firms. Following Hesarzadeh *et al.* (2020) and Li (2008), audit report readability is assessed using the *Fog* index, *FRE* and *SMOG*. Higher *Fog* index and *SMOG* levels indicate lower readability of audit reports, while the opposite is true for the *FRE* index.

Results reveal that increases in audit market competition are significantly positively correlated with audit report readability, suggesting an improvement in audit quality. To test the second hypothesis, the sample is divided into clients audited by private auditors and those audited by state audit firms to determine whether audit market competition affects both types of audit firms. The findings indicate that the relationship between competition and audit report readability is stronger among private audit firms, where competition is more intense compared to state audit firms. In sensitivity analyses, alternative measures of audit report readability, including the *FK* and *ARI* are utilized. The results for all alternative measures are consistent with the primary analyses for the first and second hypotheses. Additionally, supplementary analysis investigates the influence of auditor change and audit market size on the association between readability and audit market competition, showing that the positive effect of competition on audit report readability is more pronounced when the auditor is not changed and the audit market size is small.

This study makes several significant contributions. First, it addresses a relevant research topic that has been scarcely investigated: the association between auditor competition and audit report readability as an indicator of audit quality. Given the findings of the GAO (2003, 2008), understanding the relationship between auditor competition and audit quality is crucial for regulators and audit market participants. Second, this study substantially extends recent research focusing on competition based on auditor types (for international jurisdiction, see Kallapur *et al.*, 2010; Boone *et al.*, 2012 and for local jurisdiction, i.e. see MohammadRezaei and Mohd-Saleh, 2018) by investigating a more direct and concrete measure of audit quality—audit report readability. Third, in response to Francis *et al.* (2013)'s call for continued research on the effects of audit market concentration, this paper adds to the concentration literature by providing evidence from Iran, where due to sanctions, the Big 4 and other international audit firms are not permitted to operate, and investor protection is relatively weak compared to developed countries such as the U.S. The findings offer valuable information to governments in developing countries where strong institutions have not yet been established. Moreover, if regulators aim to reduce concentration (improve competition) to enhance audit quality in the context of this paper—audit report readability—the additional analysis suggests that private auditors play a vital role in the association between competition and audit report readability as an indicator of audit quality. Overall, this study complements and extends the recent and growing debate among regulators and researchers about audit market competition and audit quality.

The remainder of the paper is organized as follows. Section 2 discusses the literature review and hypothesis development. Section 3 presents the sample and research design, and the preliminary results, sensitivity analysis and supplementary analyses are presented in Section 4. Finally, the conclusion and remarks are presented in Section 5.

2. Background and hypotheses development

2.1 Accounting and auditing environment in Iran

Iran's accounting and auditing standards are based on international standards, with the difference being that the auditing standards align precisely with International Auditing Standards (IASs), while the accounting standards have minor differences with International Financial Reporting Standards (IFRS) (Pourheidari and Abousaiedi, 2011). However, since 2011, Iran's Securities and Exchange Organization (SEO) has developed a written plan to implement IFRS in companies' financial reports admitted to the TSE. The Islamic revolution of Iran in 1979 was accompanied by nationalizing of many private companies, providing the opportunity for governmental auditors to supply audit services and resulting in the establishment of the IAO in 1987 (MohammadRezaei and Mohd-Saleh, 2017). Iran initiated the privatization of state-owned companies in 1988 to stimulate the economy, leading to a rapid increase in TSE-listed firms. Consequently, higher demand for audit services arose while the IAO had limited capacity to provide adequate and timely audit services. To cope with this problem, the Parliament passed the "Using Services of Certified Public Accountants" Act of 1993, allowing companies to utilize the services of private audit firms that were members of the IACPA. This substantially increased the number of private accounting firms in Iran [1] (Azizkhani *et al.*, 2021; Shuraki *et al.*, 2021). After this switch, the market share of the IAO decreased from 73% in 1998 to 24% in 2004, three years after the establishment of the IACPA in 2001 (Azizkhani *et al.*, 2012; Azizkhani *et al.*, 2018).

The removal of the government auditor's monopoly and licensing changes led to rapid competition growth for the supply of audit services in Iran. This is evidenced by a 100% growth in the number of audit firms engaged by companies listed on the TSE from 2000 to 2003, with a continuing exclusion of international audit firms (Bagherpour *et al.*, 2014). By December 2015, 267 private audit firms were listed as members of the IACPA (MohammadRezaei *et al.*, 2016). The emergence of large audit firms was not observed during the development of private-sector audit firms. As a result, there has been continuously intense competition among small private audit firms for the available clients in this market structure. To monitor auditor independence in the Iranian market continuously, the SEO and the IACPA established the "Auditing and Financial Reporting" office. This office is responsible for registering "SEO's Trusted Auditors" and monitoring the audit reports of listed companies (SEO, 2005). Deficiencies in the audit reports of listed companies identified by this office are referred to the IACPA Audit Inspection office for further investigation and disciplinary action (Azizkhani *et al.*, 2018).

2.2 Audit market competition and audit quality

The audit report has consistently been a focus for regulators and scholars, as it reinforces the reliability of financial information and has important implications for users of financial reports. Most prior research on audit reports has focused on two main areas: (1) the informational content of audit reports and (2) users' reaction to the information communicated by the auditor (Mock *et al.*, 2013). As a language feature, readability can be determined by the disclosed narrative quality (Lo *et al.*, 2017). However, there is limited empirical evidence on audit reports' readability determinants. Abdelfattah and Elamer (2020) find that female audit partners provide less readable audit reports. Smith (2019) reports that key audit matters disclosures have improved the readability of audit reports in the UK market. Fakhfakh (2016) shows that standardized forms of modified audit reports are not entirely understandable to financial statement users. Given the critical role of readability in evaluating and understanding textual narratives and making optimal decisions (Hesarzadeh and Rajabalizadeh, 2019; Hasan, 2020), regulators and policymakers have initiated projects to make annual reports more readable (e.g. Securities and Exchange Commission (SEC), 1998; International Auditing and Assurance Standards Board (IAASB), 2015).

Previous studies have shown that the readability of a firm's disclosures indicates disclosure quality, and investors tend to react less strongly to information in less readable disclosures (Biddle *et al.*, 2009; Asay *et al.*, 2017). Investors who encounter less readable initial disclosures feel less confident in evaluating the firm and, as a result, rely more on external information. In this context, audit reports can be considered a reliable external source of information about firms provided by auditors. As a linguistic measure, readability assesses written information's effectiveness and financial communication tools' success (Fakhfakh, 2016; Smith, 2019). More readable reports are considered more informative (Lang and Stice-Lawrence, 2015). However, lengthy and less readable disclosures, which are less concise, can also lead to disclosure "overload" (Dyer *et al.*, 2017). More specific text containing numbers or organizational names are considered more verifiable and precise than general descriptions of topics (Dyer *et al.*, 2017). When auditors use more specific language, it suggests they have put in more effort, and their work is more reliable. Zeng *et al.* (2021) went beyond standardized language and examined the wording of each key audit matter in audit reports. They investigated the relationship between textual characteristics of audit reports, including specificity, readability, length, similarity and audit quality. Their analysis revealed that the textual characteristics of audit reports have implications for audit quality and can contribute to its improvement.

2.3 Audit market competition and audit quality

The relationship between audit market concentration and audit quality is not easily determined. On the one hand, a more concentrated audit market means fewer audit firms for clients to choose from, reducing the fear of losing clients. As a result, auditors are less likely to become lenient with their clients, maintaining their independence and leading to higher audit quality (Kallapur *et al.*, 2010; Newton *et al.*, 2013). Previous literature suggests that intense audit competition may encourage clients to make opportunistic requests from auditors, such as issuing unqualified opinions (Beattie and Fearnley, 1998; MohammadRezaei *et al.*, 2016). Furthermore, a more concentrated audit market could create economies of scale, allowing auditors to reduce audit costs while investing more effort to improve audit quality. According to the structure–conduct–performance (SCP) theory, competition is generally considered a positive force in most industries, fostering efficiency. In other words, monopoly power enables firms and managers to exert minimal effort (Casu and Girardone, 2009). It also affects a firm's behavior in terms of quantities, prices and profits (Heggestad, 1984). Consequently, increased concentration is likely to enhance the market power of leading firms – in Iran, which are state auditors – allowing them to set monopolistic prices to boost profits. This, in turn, demotivates leading firms from improving their efficiency (Heggestad, 1984). Therefore, greater competition in the market is more likely to result in higher efficiency.

On the other hand, in a concentrated audit market, auditors may have weak incentives to improve service quality and become overconfident and complacent, leading to lower audit quality (Boone *et al.*, 2012; Francis *et al.*, 2013). Previous studies contend that clients gain more bargaining power in competitive markets while auditors' bargaining power decreases, allowing clients to exert significant pressure on auditors (Beattie and Fearnley, 1998; Casterella *et al.*, 2004). This situation can impair auditor independence and reduce audit quality (Kallapur *et al.*, 2010; Huang *et al.*, 2016). Specifically, having more client options might heighten auditors' concerns about losing clients and influence their judgment (MohammadRezaei and Mohd-Saleh, 2017), leading to auditors pandering to management (Kallapur *et al.*, 2010).

2.4 Audit market competition and audit report readability

Auditors possess greater bargaining power and maintain more independence in concentrated audit markets. If this holds, auditors face lower costs for truth-telling and can demand higher audit fees and exert more effort, resulting in improved audit quality. In this regard,

MohammadRezaei and Mohd-Saleh (2018) argue that competitive pressure on Iranian auditors could increase their motivation to enhance audit efficiency. By applying the SCP theory, MohammadRezaei and Mohd-Saleh (2018) explore the impact of competition in the audit market on audit report lag, discovering that increased competition correlates with shorter audit report lag, leading to higher efficiency. In such an environment, auditors may provide higher-quality, more readable audit reports (Loughran and McDonald, 2014).

However, client bargaining power and their intentional efforts to obscure truth-telling and conceal fraud or poor performance (Merkl-Davies and Brennan, 2007) may result in less readable audit reports. The management obfuscation hypothesis suggests that top management could employ ambiguous and complex language to downplay inadequate information and avert adverse market reactions (Dempsey *et al.*, 2012; Lo *et al.*, 2017), which manifests in more complex financial and audit reports (Jones and Shoemaker, 1994; Li, 2008). In line with these arguments, empirical studies in Iran have demonstrated that audit market competition is related to higher accruals and lower audit fees (Azizkhani *et al.*, 2021; Oradi and Izadi, 2020). Although management collusion may elevate litigation risk and damage auditors' reputation, auditors' fear of losing clients will be anticipated to outweigh their reputation concerns, especially in highly competitive markets like Iran, where litigation risk is low (Bagherpour *et al.*, 2014). Given the uncertain relationship between audit market concentration and audit report readability as a sign of audit quality, the first hypothesis is presented in the null form as follows:

H1. There is no significant association between audit market competition and audit reports readability.

Since the early 1990s, as part of the Iranian government's structural reform programs aimed at implementing liberal economic policies, privatizing nationalized industries and initiating numerous structural reforms, modified international accounting standards have been introduced. This move allowed local private audit firms to verify the financial statements of listed companies, previously restricted to the government audit department, to improve the quality and credibility of financial reporting [2] (MohammadRezaei *et al.*, 2018). However, unlike other emerging countries, Iran has not permitted international accounting firms (such as the Big 4 and non-Big 4 firms) to operate within its borders. Instead, within Iran's jurisdiction, audit firms are classified into state-run firms, such as the IAO and private audit firms. In a market where the quality of services cannot be easily observed, it is possible that ranked audit firms, specifically state-owned ones in Iran, may charge higher fees without actually providing superior audit services. This notion aligns with Klein and Leffler's (1981) argument, which posits that seller firms might continue to charge premium prices for average products or services due to their reputation.

Furthermore, from the perspective of SCP theory, if competition in the audit market differs for private and state auditors, audit efficiency will also vary between these auditors. As previously discussed, state auditors hold a monopolistic audit market share with regard to SOEs, while the audit market is highly competitive for private auditors. In this context, MohammadRezaei *et al.* (2016) find that audit fees for private auditors are lower than those for state auditors. A low number of clients and low audit fees pressure private audit firms to expand their market share, audit fees or audit efficiency. In line with SCP theory, private auditors must enhance their efficiency in a competitive market, which will likely result in higher audit quality. Prior studies have investigated corporate and auditor factors that determine audit report lag (ARL) as a sign of audit quality, comparing Big vs non-Big auditors (e.g. Bamber *et al.*, 1993) and industry specialist auditors vs non-specialist auditors (e.g. Habib and Bhuiyan, 2011). While in the Iranian jurisdiction, MohammadRezaei *et al.* (2018) extend the accounting literature by comparing the effects of the emergence of private audit practices versus the use of state auditors concerning ARL and demonstrate that ARL is shorter for private auditors. The present study examines the effect of competition on audit

report readability, as a measure of audit quality, in private audit firms, where competition is more intense than state audit firms (MohammadRezaei *et al.*, 2018). Similar to the first hypothesis, given the unclear relationship between audit market concentration and audit report readability, the second hypothesis is stated in the null form as follows:

H2. There is no significant association between audit market competition and audit reports readability in private audit firms.

3. Sample and research design

3.1 Sample and data

The sample consists of all firms listed on the TSE from the second quarter of 2012–2018. The initial sample includes 1,968 firm-year observations. The study removes 480 firm-year observations ranked in financial or utility industry companies and 243 firm-years with insufficient information. Additionally, 195 firm-year observations of firms not operating for the entire period are removed. The final sample consists of 1,050 firm-year observations. The selection process is outlined in Table 1. The TSE setting is similar to the most prominent emerging capital markets Bazrafshan and Hesarzadeh, 2021; Hesarzadeh and Rajabalizadeh, 2019; Oradi and Izadi, 2020). The industry distribution of the sample observations is coded based on the industry classification used by the SEO. Observations are distributed relatively evenly across sample years in an untabulated analysis.

3.2 Variable measurements

3.2.1 Readability. In line with the extensive recent literature (Guay *et al.*, 2016; Cassell *et al.*, 2019; Bozanic *et al.*, 2019; Chychyla *et al.*, 2018; Hesarzadeh *et al.*, 2020; Raimo *et al.*, 2022), this study employs three measures of readability: the *Fog* index, Flesch Reading Ease (*FRE*) and

Panel A: Sample selection procedure

Description	Observations
Total observations from 2012 to 2018	1968
Financial or utility industry companies	(480)
Company-years with insufficient information	(243)
Firms not in operation for the entire period	(195)
Final sample used for the primary analysis	1,050

Panel B: Industry Representation

Industry	Number	Percentage (%)
Basic Metals	112	10.7
Car and Parts Manufacturing	182	17.3
Cement	112	10.7
Chemical Products	84	8.0
Drug	147	14.0
Electrical Devices	56	5.3
Food	105	10.0
Machinery	49	4.7
Tile	98	9.3
Others	105	10.0
Total	1,050	100.0

Source(s): Table created by author

Table 1. Sample selection and industry breakdown

Simple Measure of Gobbledygook (*SMOG*). The first measure of readability is the *Fog* index, developed by Robert Gunning. This well-known and simple formula measures readability (Li, 2008). The relationship between the *Fog* index and reading ease is as follows: *Fog* > 18 (unreadable), 14–18 (difficult), 12–14 (ideal), 10–12 (acceptable) and 8–10 (childish). Higher scores on the *Fog* index indicate lower readability scores for the text. To measure readability, the study relies on the following calculation:

$$Fog = 0.4 \times [number\ of\ words / number\ of\ sentences + 100 \times (number\ of\ words\ with\ more\ than\ two\ syllables / number\ of\ words)] \quad (1)$$

The second measure of readability is the Flesch Reading Ease (*FRE*), which has been used to gauge readability in various contexts (Flesch, 1948). Practitioners and scholars widely use and trust it (Adhariani and Du Toit, 2020). *FRE* relies on elements such as syllables, total sentences and word count to assess the readability of a text. It assumes a score ranging from 0 to 100 (Flesch, 1979). The relationship between the *FRE* and reading ease is as follows: 0–30 (very difficult), 30–50 (difficult), 50–60 (fairly difficult), 60–70 (standard), 70–80 (fairly easy), 80–90 (easy) and 90–100 (very easy). In contrast to the *Fog* index, a high *FRE* score indicates a more readable text, making it easier to interpret even for readers with less understanding (Adhariani and Du Toit, 2020; Raimo *et al.*, 2022). To harmonize this measure with the other two readability measures, it is multiplied by −1 and used in the univariate analyses. *FRE* is calculated using the following formula:

$$FRE = 206.835 - 1.015 \times (Total\ words / Total\ sentences) - 84.6 \times (Total\ syllables / Total\ words). \quad (2)$$

The third measure of readability is the Simplified Measure of Gobbledygook (*SMOG*). The creator of the *SMOG* readability formula, G. Harry McLaughlin (1969), defines readability as: "the degree to which a given class of people find certain reading matter compelling and comprehensible." This definition stresses the interaction between the text and a class of readers with known characteristics such as reading skills, prior knowledge and motivation. Similar to the *Fog* index, a higher level of *SMOG* is associated with a lower level of readability. The relationship between *SMOG* and reading ease is as follows: 4.9 or lower (elementary school), 5–8.9 (Middle school), 9–12.9 (high school), 13–16.9 (undergraduate) and 17 or higher (graduate). The formula counts the words with three or more syllables in three 10-sentence samples, estimates the count's square root (from the nearest perfect square) and adds 3 to the result.

$$SMOG = 1.043 \times sqrt\,[30 \times number\ of\ words\ with\ more\ than\ two\ syllables / number\ of\ sentences] + 3.1291 \quad (3)$$

Following the broader literature (e.g. Lawrence, 2013; Lehavy *et al.*, 2011; Li, 2008), this study employs the *FK* index and *ARI* as alternative measures of audit report readability in additional tests.

As mentioned in the sample and data section, the final sample comprises 1,050 firm-year observations. Due to the lack of accurate software to calculate readability for the Persian language, the paper's complexity computations are performed manually by independent contractors who are not affiliated with the authors. This process involves downloading all annual financial reports in PDF format from Codal [3] and converting them to Word documents to extract audit report sections. It is important to note that some PDFs are uploaded as images. For these cases, audit reports are separately downloaded from Codal, transcribed into text and subjected to the same process as the converted Word documents.

In the final step, the components of readability measures, including the number of syllables, words and sentences, are manually calculated using Word and then transferred to Excel sheets to compute the final readability measures. To verify the accuracy, ten audit reports were randomly selected and the number of words per sentence and syllables per word was manually counted to recalculate the readability measures. In most cases, the difference between the results from the independent contractors and the paper's author is less than 5%, confirming the process's validity.

Furthermore, Li (2010) compares manual and automated content analysis. The high-quality manual analysis offers the advantages of more precise coding and detailed examination. In fact, applying more accurate manual coding to a few hundred observations may yield greater power than using automated methods on tens of thousands of documents, given the complexity of linguistic features.

3.2.2 Audit market competition. Numerous previous studies (e.g. Ding and Jia, 2012; Bagherpour *et al.*, 2014) utilize a dummy variable to investigate the impact of competition or concentration in the audit market. Prior research also measures the audit market concentration level at the country and city levels using the Herfindahl-Hirschman Index (HHI) (e.g. Francis *et al.*, 2013). The HHI increases as the number of audit firms equally sharing an audit market decreases. Additionally, the HHI increases as the disparity in audit fees among audit firms grows. Consequently, the HHI would be the highest for a market with a single audit firm and the lowest for numerous firms with similar audit market shares. In the context of the audit market, the HHI is computed by summing the squares of the market share ratios of each audit firm, where the market share is determined by comparing the audit firm's size to the total size of the audit market [4].

To compute the HHI for the entire audit market, it is first necessary to determine the size of each audit firm and the overall audit market. The size of an audit firm can be measured through various proxies, such as audit fees, client numbers, total assets or sales of clients. In this study, clients' total assets serve as the measure of an audit firm's size [5]. The total size of the audit market can be determined by aggregating clients' total assets for all audit firms in the market. Subsequently, the market share of each audit firm is calculated as the ratio of the firm's size (total assets of clients) to the total size of the audit market (total aggregate assets of clients for all firms). This calculation is performed for each audit firm annually to determine the annual market share. Finally, to compute the HHI for the audit market, the market share of each audit firm is squared and these squared values are summed across all firms in the market. The resulting HHI measures market concentration, with higher values indicating greater concentration and lower values suggesting a more competitive market. Since the HHI measures auditor concentration, lower index values signify greater auditor competition. As a result, the concentration measure is multiplied by -1 to create the competition variable (*AudComp*).

3.2.3 Control variables. The remaining variables in the primary model (Equation 4) are conventional explanatory variables utilized in previous studies to explain corporate disclosure quality, such as readability and audit research (Azizkhani *et al.*, 2021; Hesarzadeh *et al.*, 2020; Hesarzadeh and Rajabalizadeh, 2019; Oradi and Izadi, 2020; MohammadRezaei and Mohd-Saleh, 2018).

Auditor and audit firm characteristics, including auditor type (*AudType*), auditor change (*AudChange*), auditor tenure (*AudTenure*), auditor opinion (*AudOpn*), and audit report lag (*ARL*), are incorporated. In line with Azizkhani *et al.* (2021), clients with qualified audit opinions or those who switch audit firms tend to experience longer *ARL*s and pay higher audit fees, signaling audit quality. Moreover, larger auditors are anticipated to be more efficient and charge higher audit fees to deliver superior audit quality. Firm complexity and risk are controlled by incorporating variables such as restated financial statements (*Rest*), institutional ownership (*InstOwn*), total accruals (*Accruals*), leverage calculated as total debt divided by total assets (*Lev*), operating cash flow divided by total assets (*Ocf*), the natural

logarithm of total sales (*LnSale*), the current ratio (*Curr*), loss indicator (*Loss*), the natural logarithm of the number of business segments (*Segment*), Altman's Z-score (*Altz*) and client's age (*LnAge*). For instance, auditing clients who are highly leveraged, more complex (indicated by the number of subsidiaries) or incur losses typically requires more time; thus, reporting lags are expected to be longer and higher audit fees are likely to be charged (Azizkhani *et al.*, 2021). Total accruals are expected to be higher for firms in growth stages (aged firms) than those in stagnant stages (Anthony and Ramesh, 1992; MohammadRezaei *et al.*, 2018). Industry fixed effects (*Industry FE*) are also controlled in the main regression model [6]. All the mentioned variables are manually collected from firms' financial reports and available databases. Table 2 provides variable definitions.

3.3 Research design

To investigate the impact of audit market competition on the readability of audit reports, the following regression model is employed:

Variable	Description
Dependent Variable	
AudCopm	$= -1 *$ HHI of market concentration calculated as the sum of squares of the ratios of each audit office's size (total assets) to the total size of the audit market. HHI $= (\overline{Market\ Share\_i})^2$
Independent Variables (Readability)	
Fog	$= 0.4 \times$ [number of words/number of sentences $+ 100 \times$ (number of words with more than three syllables/number of words)] computed precisely as in Li (2008)
FRE	= 206.835–1.015 (Total words/Total sentences) – 84.6 (Total syllables/Total words)
SMOG	$= 1.043 \times$ sqrt [30 $\times$ number of words with more than two syllables/number of sentences] + 3.1291
Control Variables	
AudType	= 1 if the auditor is a state audit firm, 0 otherwise
AudChange	= 1 if the auditor switched, 0 otherwise
AudTenure	= Auditor tenure in years
AudOpn	= 1 if the audit opinion is qualified, 0 for the unqualified audit opinion
ARL	= Audit report lag, days between a firm's fiscal year-end and the audit report date
Rest	= 1 if the company restates its financial reports for the fiscal year t in a subsequent year, 0 otherwise
InstOwn	= The percentage of the company's shares owned by institutional owners
Accruals	= Total accruals, measured as income before extraordinary items less operating cash flows, all divided by total assets
Lev	= Total debt divided by total assets
Ocf	= Operating cash flow divided by total assets
LnSale	= Natural logarithm of total sales (Million Rials)
Curr	= Current assets/total assets
Loss	= 1 if net income is negative, and 0 otherwise
Segment	= Natural logarithm of the number of business segments
Altz	= Altman's Z-score is computed as: [(1.4 $\times$ retained earnings + sales + 3.3 $\times$ pre-tax income +1.2 $\times$ (current assets−current liabilities)) ÷ total assets]
LnAge	= Natural log of the number of years from the establishment of a client firm
Additional Variables	
FK	$= 0.39 \times$ [number of words/number of sentences] + 11.8 $\times$ [number of syllables/number of words] – 15.59
ARI	$= 4.71 \times$ (characters/words) + 0.5 $\times$ (words/sentences) – 21.43

Table 2. Variable definitions

Source(s): Table created by author

$$Readability_{it} = \beta_0 + \beta_1 AudCopm_{it} + \beta_2 AudType_{it} + \beta_3 AudChange_{it} + \beta_4 AudTenure_{it} + \beta_5 AudOpn_{it} + \beta_6 ARL_{it} + \beta_7 Rest_{it} + \beta_8 InstOwn_{it} + \beta_9 Accruals_{it} + \beta_{10} Lev_{it} + \beta_{11} Ocf_{it} + \beta_{12} LnSale_{it} + \beta_{13} Curr_{it} + \beta_{14} Loss_{it} + \beta_{15} Segment_{it} + \beta_{16} Altz_{it} + \beta_{17} LnAge_{it} + Industry\,FE + \varepsilon_{it} \quad (4)$$

In the model, *Readability* represents the readability of the auditor's report, measured using the *Fog* index, *FRE* and *SMOG*. The test variable, *AudComp*, denotes audit market competition, calculated as the HHI multiplied by −1. Other control variables employed in previous studies are already defined in Section 3.2.3. The sample is divided into two subsamples to test the second hypothesis, which examines the impact of auditor type (private vs state auditor [7]). All analyses are then conducted within these two categories.

3.4 Descriptive statistics

Table 3, Panel A presents the descriptive statistics for audit report readability, audit market competition and other variables included in the primary analyses. All variables are winsorized at the 1% and 99% levels to mitigate the effect of outliers. Previous studies using the *Fog* index in the Iranian context found mean values around 15 for financial statement notes (Hesarzadeh and Rajabalizadeh, 2019) and MD&A sections (Hesarzadeh *et al.*, 2020). These values are lower than those in studies examining annual reports written in English, such as Li (2008) and Lo *et al.* (2017), with *Fog* index averages of approximately 18–19. However, no study has explored audit report readability in the Iranian market. Therefore, to provide some Persian benchmarks inspired by Li (2008) and Lehavy *et al.* (2011), the readability measures for 20 Iranian Auditing Standards, precisely translated from IASs, are randomly calculated. On average, the *Fog* for these standards is approximately 20. Compared to these indices, the *Fog* for the audit reports indicates that they are relatively hard to read.

The average *Fog* for audit reports in this study, which is the dependent variable, is approximately 21.56. This figure is higher than the manipulated indices and previous *Fog* indexes in the Iranian jurisdiction but lower than the *Fog* index of KAMs in Zeng *et al.* (2021) and Seebeck and Kaya (2022), which were 25.775 and 25.57, respectively. This figure aligns with studies on audit reports in other jurisdictions, considering that sentence length is generally 15% shorter in Persian than in English (KhazaeeFarid and Fathollahi, 2010). The mean for two other readability indexes, *FRE* and *SMOG*, are 47.780 and 18.021, respectively, which indicates low readability in audit reports. It is important to note that the value obtained for *FRE* of audit reports in this study is higher than those found by other researchers in different jurisdictions (Raimo *et al.*, 2022; Stone and Lodhia, 2019; Velte, 2018; Du Toit, 2017). The *SMOG* index exceeds 17, which is categorized as the lowest level of readability (equivalent to graduate level). The mean (median) value of *AudCopm* in this research is −0.362 (−0.256), a figure that aligns with earlier studies in the Iranian audit market, such as Kordestani *et al.* (2018) and Oradi *et al.* (2018).

For control variables, the most significant descriptive findings show that, on average, 22.3% of auditors in the sample were state auditors (*AudType*), and 24.2% of auditors changed in the next year (*AudChange*). The mean audit tenure (*AudTenure*) is 2.711 years, and 50.4% of audit reports had an unqualified opinion (*AudOpn*). The mean (median) *ARL* value of 77.557 days (79.50 days) is similar to the prior *ARL* study in Iran (Oradi and Izadi, 2020; 76.31 days). Almost 73% of firms restated their financial statements (*Rest*), and the mean institutional ownership (*InstOwn*) is 58.2%, consistent with previous research on corporate governance in Iran (e.g. Oradi *et al.*, 2020; Oradi and Izadi, 2020). The mean values

Variables	Mean	Median	Std.Dev	Max	0.75	0.25	Min
Panel A: Descriptive Statistics for the Full Sample (n = 1,050)							
Fog	21.561	21.962	3.071	26.599	23.587	19.695	13.616
FRE	47.780	35.997	19.396	78.903	68.297	31.901	13.947
SMOG	18.021	18.328	2.153	21.665	19.464	16.576	12.838
AudCopm	−0.362	−0.256	0.258	−0.092	−0.182	−0.417	−0.914
AudType	0.223	0.000	0.416	1.000	0.000	0.000	0.000
AudChange	0.242	0.000	0.428	1.000	0.000	0.000	0.000
AudTenure	2.711	2.000	1.853	9.000	4.000	1.000	1.000
AudOpn	0.496	0.000	0.500	1.000	1.000	0.000	0.000
ARL	77.557	79.500	26.774	151.000	103.000	51.000	18.000
Rest	0.730	1.000	0.444	1.000	1.000	0.000	0.000
InstOwn	0.582	0.690	0.322	0.995	0.845	0.345	0.000
Accruals	0.021	0.013	0.137	0.528	0.087	−0.055	−0.615
Lev	0.631	0.615	0.260	1.788	0.746	0.474	0.131
Ocf	0.123	0.104	0.140	0.642	0.191	0.044	−0.460
LnSale	14.114	13.932	1.554	19.719	14.742	13.221	9.007
Curr	0.669	0.697	0.190	0.970	0.829	0.532	0.121
Loss	0.138	0.000	0.345	1.000	0.000	0.000	0.000
Segment	0.490	0.000	0.766	3.664	0.693	0.000	0.000
Altz	1.642	1.591	1.227	4.982	2.306	0.977	−1.990
LnAge	3.593	3.714	0.387	4.205	3.912	3.332	2.303

Panel B: Descriptive Statistics by Auditor Type

	State Auditor = 1 (n = 234)		Private Auditor = 0 (n = 816)			
	Mean	Std.Dev	Mean	Std.Dev	Differences in Means	*p* value
Fog	21.471	3.187	21.875	2.609	−0.404**	0.024
FRE	49.055	19.660	43.332	17.780	5.724***	0.000
SMOG	17.955	2.222	18.249	1.883	−0.294**	0.022
AudCopm	−0.424	0.286	−0.343	0.248	−0.081***	0.001
AudChange	0.021	0.145	0.305	0.461	−0.284***	0.000
AudTenure	4.791	2.281	2.115	1.155	2.675***	0.000
AudOpn	0.436	0.497	0.513	0.500	−0.078**	0.018
ARL	86.427	26.404	75.013	26.350	11.414***	0.000
Rest	0.671	0.471	0.748	0.435	−0.077**	0.013
InstOwn	0.664	0.259	0.558	0.334	0.106***	0.000
Accruals	0.030	0.129	0.018	0.139	0.012	0.122
Lev	0.698	0.263	0.612	0.256	0.085***	0.000
Ocf	0.115	0.140	0.125	0.140	−0.011	0.153
LnSale	15.022	1.583	13.853	1.444	1.169***	0.000
Curr	0.685	0.187	0.664	0.191	0.021*	0.065
Loss	0.175	0.381	0.127	0.334	0.048**	0.042
Segment	0.723	1.052	0.423	0.647	0.300***	0.000
Altz	1.454	1.342	1.696	1.187	−0.241***	0.004
LnAge	3.656	0.391	3.575	0.385	0.081***	0.002

Note(s): This table presents the descriptive statistics for the variables used in the main analysis. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively. Please refer to Table 2 for variable definitions
Source(s): Table created by author

Table 3.
Descriptive statistics

for *Accruals*, *LEV*, *Ocf* and *LnSale* were 0.021, 0.631, 0.123 and 14.114, respectively, consistent with previous studies conducted in Iran (Oradi *et al.*, 2020; Hesarzadeh and Rajabalizadeh, 2019; Hesarzadeh *et al.*, 2020). The other descriptive statistics were also consistent with prior studies in the Iranian market.

Table 3, Panel B provides a bivariate analysis of mean differences to support the univariate analyses of the second hypothesis, which examines the impact of audit market competition on audit report readability in private [8] versus state auditors. The findings are consistent with the second hypothesis, as the intense competition among private audit firms leads to a more robust relationship between audit market competition and audit report readability compared to state audit firms. The table shows that the mean of readability indexes, including the *Fog*, *FRE* and *SMOG*, for private (state) audit firms are 21.875 (21.471), 43.332 (49.055) and 18.249 (17.955), respectively. The *p* value for the mean differences between the three measures is below 5%, indicating that firms audited by private audit firms document audit reports that are more difficult to read. Furthermore, the mean value for audit market competition (*AudComp*) for private (state) audit firms is −0.343 (−0.424), indicating the intense competition among private audit firms over state ones, which is consistent with previous studies in Iran (Azizkhani *et al.*, 2021; MohammadRezaei and Mohd-Saleh, 2018).

The findings in Panel B of Table 3 suggest some notable differences between clients of private auditors and state auditors. Clients of private auditors are more likely to experience auditor change, receive qualified audit opinions and have a higher rate of misstatements. Additionally, they tend to be younger firms and are more likely to be categorized as bankrupt. On the other hand, clients of private auditors have lower audit tenure, shorter audit report lag and lower ownership concentration compared to those of state auditors. They also have lower leverage, lower sales and a less current ratio. Furthermore, they experience less loss and have fewer subsidiaries. These findings may suggest that private auditors are more likely to take on riskier clients or those needing more frequent audit services due to their younger age or financial instability.

Table 4 shows the Pearson correlation coefficients among the variables included in the primary analyses. The results indicate that *AudComp* is significantly and negatively correlated with the *FRE* index (−0.062), suggesting that higher audit market competition is associated with greater audit report readability. However, *AudComp* is not significantly correlated with the *Fog* and *SMOG* indices (−0.045 and −0.044, respectively). It is important to note that these correlations only provide preliminary evidence of the relationship between the variables and should be interpreted cautiously. Additionally, the Variance Inflation Factor (VIF) scores for the independent variables are less than 5, indicating that multicollinearity is not a problem in the primary regression model (Gujarati, 1995).

4. Empirical analysis results

4.1 Association of readability and audit market competition (H1)

Table 5 presents the estimation results for the primary analysis using the main research model (Equation 4). In general, the table reveals a negative and significant association between *AudComp* and *Fog* index (coefficient = −3.427; $p < 0.01$), *FRE* (coefficient = −5.799; $p < 0.01$) and *SMOG* (coefficient = −2.556; $p < 0.01$) [9]. This outcome supports the first hypothesis, suggesting that readability increases with heightened competition in the Iranian audit market. This demonstrates that audit market competition positively impacts the readability of audit reports, serving as an indicator of audit quality. As discussed in the hypothesis development section, in concentrated audit markets like Iran, the selection of audit firms is limited due to the fear of losing clients, clients' opportunistic requests for unqualified audit reports and potential reputation damage (Beattie and Fearnley, 1998; MohammadRezaei *et al.*, 2016). Moreover, in such a concentrated audit market, auditors can reduce audit costs while increasing their effort to enhance audit quality. This leads to less leniency toward clients, less impairment in auditor independence and ultimately higher audit quality (Kallapur *et al.*, 2010; Newton *et al.*, 2013), as reflected in the textual features of audit reports.

Table 4.
Correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. *Fog*	1										
2. *FRE*	*0.367*	1									
3. *SMOG*	*0.973*	*0.362*	1								
4. *AudComp*	−0.045	*−0.062*	−0.044	1							
5. *AudType*	0.055	*0.123*	0.057	−0.056	1						
6. *AudChange*	−0.054	−0.058	−0.058	0.020	*−0.276*	1					
7. *AudTenure*	*0.069*	*0.069*	*0.077*	−0.031	*0.601*	*−0.366*	1				
8. *AudOpn*	*0.105*	*0.165*	*0.149*	0.006	*−0.065*	−0.005	0.002	1			
9. *ARL*	*−0.134*	*−0.131*	*−0.168*	−0.047	*0.177*	−0.020	*0.118*	*−0.289*	1		
10. *Rest*	*−0.067*	−0.040	*−0.071*	*−0.064*	*−0.072*	0.052	*−0.149*	*−0.148*	*0.063*	1	
11. *InstOwn*	*0.180*	*0.150*	*0.182*	0.042	*0.137*	−0.033	0.048	*0.153*	*−0.332*	0.020	1
12. *Accruals*	−0.033	*0.076*	−0.016	*−0.075*	0.036	*−0.063*	−0.036	*0.136*	*−0.142*	*−0.067*	0.032
13. *Lev*	0.019	0.034	0.007	−0.047	*0.136*	−0.010	*0.122*	*−0.138*	*0.095*	0.019	*0.161*
14. *Ocf*	0.000	0.045	0.022	0.028	−0.032	0.014	−0.036	*0.159*	*−0.177*	−0.049	*0.110*
15. *LnSale*	0.057	*0.066*	0.037	0.051	*0.313*	*−0.141*	*0.225*	−0.020	0.012	−0.033	*0.249*
16. *Curr*	*−0.064*	*0.087*	*−0.074*	*−0.132*	0.046	*0.005*	0.027	0.017	0.025	−0.042	−0.015
17. *Loss*	0.039	−0.048	0.028	0.004	0.058	0.012	*0.062*	*−0.171*	*0.168*	*0.081*	−0.011
18. *Segment*	*0.079*	*−0.061*	*0.061*	0.001	*0.163*	−0.051	*0.090*	*−0.195*	*0.219*	*0.128*	*−0.142*
19. *Altz*	−0.005	*0.069*	0.018	−0.004	*−0.082*	−0.021	*−0.117*	*0.233*	*−0.233*	*−0.086*	0.058
20. *LnAge*	−0.006	*0.103*	−0.011	−0.020	*0.087*	−0.039	*0.074*	−0.009	*0.183*	0.018	*−0.183*
Variables	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	
12. *Accruals*	1										
13. *Lev*	*−0.105*	1									
14. *Ocf*	*−0.143*	*−0.099*	1								
15. *LnSale*	*0.135*	*0.173*	*0.222*	1							
16. *Curr*	*0.272*	*0.207*	−0.001	−0.013	1						
17. *Loss*	*−0.377*	*0.401*	*−0.200*	*−0.063*	*−0.072*	1					
18. *Segment*	−0.041	−0.043	*−0.085*	*0.377*	*−0.111*	0.050	1				
19. *Altz*	*0.464*	*−0.445*	*0.479*	*0.227*	*0.302*	*−0.526*	*−0.141*	1			
20. *LnAge*	−0.042	0.019	*−0.071*	−0.023	0.023	*0.093*	*0.158*	*−0.093*	1		

Note(s): This table summarizes Pearson correlations for the variables used in our analyses. Correlations that are significant at p value <0.05 are displayed in italic. Please refer to Table 2 for variable definitions

Source(s): Table created by author

Dependent variables		Fog		FRE		SMOG	
Variables	P. sign	Coef	*p* value	Coef	*p* value	Coef	*p* value
AudCopm	?	−3.427***	0.000	−5.799***	0.000	−2.556***	0.000
AudType	?	−0.282	0.323	−3.842**	0.030	−0.132	0.502
AudChange	?	−0.190	0.392	−0.744	0.590	−0.134	0.383
AudTenure	?	0.052	0.413	0.308	0.434	0.055	0.209
AudOpn	–	0.358*	0.072	5.094***	0.000	0.377***	0.006
ARL	?	−0.008*	0.053	−0.030	0.228	−0.008***	0.008
Rest	?	−0.669***	0.001	−1.073	0.404	−0.446***	0.002
InstOwn	+	1.663***	0.000	4.419**	0.033	1.110***	0.000
Accruals	+	−0.714	0.450	−7.014	0.232	−0.303	0.643
Lev	+	0.060	0.910	0.046	0.989	0.212	0.563
Ocf	?	−0.621	0.499	−6.835	0.231	−0.213	0.737
LnSale	?	−0.061	0.475	−0.401	0.448	−0.095	0.104
Curr	?	−0.631	0.344	−8.634**	0.037	−0.834*	0.071
Loss	+	0.248	0.443	2.809	0.162	0.227	0.310
Segment	+	0.558***	0.000	2.137**	0.020	0.415***	0.000
Altz	+	0.140	0.374	1.465	0.133	0.165	0.128
LnAge	?	0.246	0.330	8.298***	0.000	0.143	0.413
Intercept		Included		Included		Included	
Industry FE		Included		Included		Included	
Adj. *R*-square		0.143		0.172		0.168	
F		8.028***		9.691***		9.478***	
Observations		1,050		1,050		1,050	

Note(s): *, ** and *** denote significance at the 10, 5 and 1% levels, respectively
Source(s): Table created by author

Table 5.
Regression results of readability on audit market competition (H1, n = 1,050)

Additionally, on average, the type of auditor opinion (*AudOpn*), audit report lag (*ARL*), restatement (*Rest*), institutional ownership (*InstOwn*), the natural logarithm of sales (*LnSale*), current ratio (*Curr*), the natural logarithm of the number of business segments (*Segment*) and risk of bankruptcy (*Altz*) significantly explain audit report readability. Concerning auditor characteristics, readability indexes are generally positively associated with auditor opinion (*AudOpn*), indicating that firms with qualified audit opinions have less readable audit reports, likely due to more comprehensive audit reports. A negative relationship was observed for the audit report lag variable (*ARL*), suggesting that increased lag in auditors' reports leads to more readable audit reports. In summary, restatement (*Rest*), the natural logarithm of sales (LnSale) and current ration (*Curr*) exhibit a negative and significant relationship with readability, while other control variables such as institutional ownership (*InstOwn*), client business segments (*Segment*) and risk of bankruptcy (*Altz*) show a positive and significant relationship. The explanatory power of the regression models is (on average) approximately 8.5%, which aligns with recent prior research (e.g. Hesarzadeh *et al.*, 2020; Hesarzadeh and Rajabalizadeh, 2019; Martineau, 2018; Perotti and Windisch, 2017).

Regarding the economic significance of the baseline results, the observed associations between audit competition and readability measures have practical implications. As audit report readability is a crucial aspect of financial communication, improved readability can lead to better-informed decision-making by investors, regulators and other stakeholders. While the current study does not directly quantify the economic impact, it does highlight the importance of audit market competition in enhancing audit report readability and, consequently, audit quality. This suggests that policies promoting competition in the audit market may contribute to increased transparency, better financial communication and improved stakeholder decision-making.

4.2 Association of readability and audit market competition in private audit firms (H2)

Table 6 presents the estimation results for the second hypothesis using the primary research model, which compares private audit firms, where competition is intense, to state audit firms. For private auditors, there is a strong negative and significant association between *AudComp* and readability measures including *Fog* index (coefficient = −3.260; $p < 0.001$), *FRE* (coefficient = −11.025; $p < 0.05$) and *SMOG* (coefficient = −2.490; $p < 0.001$). In contrast, for state auditors, the association between *AudComp* and readability measures is weaker and not always statistically significant: *Fog* index (coefficient = −1.693; $p < 0.075$), *FRE* (coefficient = −8.817; $p > 0.1$) and *SMOG* (coefficient = −0.448; $p > 0.6$).

To further investigate the difference in the effects of audit market competition on audit report readability between private and state audit firms, the seemingly unrelated estimation (suest) [10] method was used to compare the coefficients between the two groups for each readability measure. For the *Fog* index, the calculated chi-square was 6.75 with a p value of 0.009, indicating a statistically significant difference in the coefficients. For the *FRE* measure, the chi-square was 3.05 with a p value of 0.081, which shows a marginally significant difference. Lastly, for the *SMOG* measure, the chi-square was 4.45, yielding a p value of 0.035, demonstrating a significant difference [11]. Thus, it can be concluded that increased audit market competition has a more potent influence on enhancing audit report readability among private audit firms, affirming the beneficial effect of competition on readability as a measure of audit quality.

These results are based on the SCP theory, which posits that in a competitive market for private auditors, they improve their efficiency, likely resulting in higher audit quality. The results for other control variables remain consistent with the first hypothesis. From an economic perspective, the results suggest that policies promoting competition in the audit market, particularly in the private sector, could lead to more transparent and accessible audit reports. As a result, investors, regulators and other stakeholders would be better equipped to make informed decisions based on these reports. The enhanced readability of audit reports might also foster greater investor confidence and market efficiency in the long run. Furthermore, comparing private and state audit firms highlights the potential benefits of encouraging competition among private audit firms to improve audit quality. The economic significance of these results lies in their potential influence on policy decisions and market dynamics and their impact on the overall financial reporting landscape.

4.3 Sensitivity analyses

This section evaluates the sensitivity of the main findings to alternative measures of readability and audit market competition. The previous findings were based on three readability measures: *Fog* index, *FRE* and *SMOG*. To ensure that the results are not specific to these readability measures and to mitigate the influence of idiosyncratic measurement error in any given measure, the sensitivity of the main findings (reported in Tables 5 and 6) to alternative readability measures is assessed. Consequently, following some prior literature (e.g. Hesarzadeh *et al.*, 2020; Moffit and Burns, 2009), the *FK* [= 0.39 × (number of words/number of sentences) + 11.8 × (number of syllables/Number of words) – 15.59] and *ARI* [= 4.71 × (characters/words) + 0.5 × (words/sentences) – 21.43] are used as alternative readability measures. The results are presented in Table 7. In summary, the results demonstrate that audit market competition (*AudComp*) has a significant relationship with all alternative readability measures for both hypotheses. This confirms that the main findings are robust to alternative readability measures and underscores the validity and reliability of the initial conclusions drawn from Tables 5 and 6.

4.4 Supplemental analyses

4.4.1 Auditor change impact. This section examines the effect of auditor change on the primary model analysis, considering the economic significance of the results. Previous

Table 6.
Regression results of readability on audit market competition in private vs state audit firms (H2)

Dependent Variables		Private Audit Firms (n = 816)			State Audit Firms (n = 234)		
		Fog	FRE	SMOG	Fog	FRE	SMOG
Variables	P. Sign	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)
AudCopm	?	−3.260*** (0.000)	−11.025** (0.045)	−2.490*** (0.000)	−1.693* (0.075)	−8.817 (0.113)	−0.448 (0.670)
AudChange	?	−0.210 (0.380)	−0.494 (0.734)	−0.157 (0.336)	−0.437 (0.698)	−0.116 (0.486)	−0.290 (0.720)
AudTenure	?	0.012 (0.903)	0.264 (0.651)	0.013 (0.844)	0.035 (0.674)	0.539 (0.312)	0.064 (0.285)
AudOpn	−	0.274 (0.236)	−4.992*** (0.000)	0.305* (0.054)	0.684 (0.108)	−4.829* (0.077)	0.697** (0.023)
ARL	?	−0.003 (0.549)	−0.036 (0.214)	−0.005 (0.147)	−0.020** (0.018)	−0.001 (0.987)	−0.015** (0.013)
Rest	?	−0.750*** (0.002)	−0.443 (0.767)	−0.549*** (0.001)	0.005 (0.989)	−1.247 (0.612)	0.215 (0.436)
InstOwn	+	2.208*** (0.000)	2.780 (0.244)	1.435*** (0.000)	0.677 (0.330)	1.843 (0.678)	−0.338 (0.498)
Accruals	+	−1.344 (0.199)	−6.460 (0.311)	−0.719 (0.316)	1.407 (0.115)	−2.981 (0.859)	4.812** (0.011)
Lev	+	−0.228 (0.717)	−2.834 (0.460)	0.069 (0.873)	−0.386 (0.752)	−6.246 (0.424)	−0.375 (0.670)
Ocf	?	−1.537 (0.138)	−10.312 (0.103)	−0.865 (0.223)	−1.816*** (0.002)	−10.141 (0.279)	5.930*** (0.001)
LnSale	?	−0.061 (0.549)	−0.788 (0.203)	−0.113 (0.104)	−0.028 (0.270)	−1.044*** (0.000)	−0.161 (0.280)
Curr	?	−0.247 (0.764)	−0.662 (0.895)	−0.581 (0.302)	−0.115 (0.838)	−1.122** (0.038)	−1.443 (0.119)
Loss	+	0.345 (0.361)	2.740 (0.234)	0.307 (0.236)	0.122 (0.844)	1.661 (0.675)	0.133 (0.766)
Segment	+	0.595*** (0.002)	4.289*** (0.000)	0.441*** (0.001)	0.655** (0.013)	−3.767*** (0.001)	0.422** (0.025)
Altz	+	0.326* (0.072)	1.779 (0.107)	0.308** (0.013)	0.166** (0.011)	3.527 (0.180)	−0.745** (0.012)
LnAge	?	0.245 (0.406)	8.606*** (0.000)	0.143 (0.481)	0.971* (0.094)	8.886** (0.017)	0.859** (0.040)
Intercept		Included	Included	Included	Included	Included	Included
Industry FE		Included	Included	Included	Included	Included	Included
Adj. *R*-square		0.159	0.179	0.188	0.144	0.170	0.116
F		7.397***	8.396***	8.843***	6.120***	5.443***	3.784***
Observations		816	816	816	234	234	234

Note(s): *, ** and *** denote significance at the 10, 5 and 1% levels, respectively
Source(s): Table created by author

Panel A. Regressions of Readability Alternatives on Audit Market Competition (H1, n = 1050)

Dependent Variables		FK		ARI	
Variables	P. Sign	Coef	*p* value	Coef	*p* value
AudCopm	?	−7.978***	0.000	−4.156***	0.000
Intercept and Controls		Included		Included	
Industry FE		Included		Included	
Adj. *R*-square		0.204		0.119	
F		11.767***		6.662***	
Observations		1050		1050	

Panel B. Regressions of Readability Alternatives on Audit Market Competition in Private vs State Audit Firms (H2)

		Private Audit Firms (n = 816)		State Audit Firms (n = 234)	
Dependent variables		FK	ARI	FK	ARI
Variables	P. sign	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)
AudCopm	?	−6.883*** (0.000)	−3.725*** (0.002)	−4.652* (0.072)	−1.391 (0.442)
Intercept and Controls		Included	Included	Included	Included
Industry FE		Included	Included	Included	Included
Adj. *R*-square		0.225	0.119	0.125	0.047
F		10.840***	5.599***	5.274***	4.733***
Observations		816	816	234	234

Note(s): *, ** and *** denote significance at the 10, 5, and 1% levels, respectively
Source(s): Table created by author

Table 7.
Regression results of readability alternatives and audit market competition

studies (Beattie and Fearnley, 1998) have shown that fees are the most frequently cited reason for considering auditor change and the most frequently cited factor influencing the selection of a new auditor. Audit firms also appeared to adapt their behavior in response to new competitive pressures: audit fees began to decline in real terms, and incoming auditors were believed to have secured their appointment by offering significant fee reductions.

The sample is partitioned based on auditor change, yielding 796 firm-years without auditor change and 254 firm-years with auditor change. This process is replicated for private audit firms, resulting in 567 firm-year observations without change and 249 with change. Table 8 indicates a significant and negative correlation between *AudComp* and readability measures such as the *Fog* index (coefficient = −2.611, $p < 0.01$), *FRE* (coefficient = −4.504, $p < 0.05$) and *SMOG* (coefficient = −1.971, $p < 0.01$) in firm-years without an auditor change. Conversely, when auditors are changed, the correlation is weaker: *Fog* index (coefficient = −1.664, $p < 0.05$), *FRE* (coefficient = −1.885, $p < 0.1$) and *SMOG* (coefficient = −0.569, $p < 0.1$). For private audit firms without auditor changes, a significant negative association exists between *AudComp* and readability measures: *Fog* index (coefficient = −2.329, $p < 0.05$), *FRE* (coefficient = −8.074, $p < 0.05$) and *SMOG* (coefficient = −1.866, $p < 0.05$). However, when auditors are changed within private firms, the correlation is weaker but still significant: *Fog* index (coefficient = −1.156, $p < 0.1$), *FRE* (coefficient = −6.255, $p < 0.1$) and *SMOG* (coefficient = −0.915, $p < 0.1$).

In order to further scrutinize the difference in the impact of audit market competition on audit report readability between firms with unchanged auditors and those with changed auditors, both in the full sample and within private firms, the seemingly unrelated estimation method was used to compare the coefficients between the two groups for each readability measure. In the full sample, for the *Fog* index, the calculated chi-square was 5.29, corresponding to a *p* value of 0.021, indicating a statistically significant difference in the coefficients. For *FRE*, the chi-square was 3.42 with a *p* value of 0.064, showing a marginally

Panel A. Regressions of Readability on Audit Market Competition (H1, n = 1050)

Dependent Variables		Non-Changed Auditor (n = 796)			Changed Auditor (n = 254)		
Variables	P. Sign	Fog Coef. (*p* value)	FRE Coef. (*p* value)	SMOG Coef. (*p* value)	Fog Coef. (*p* value)	FRE Coef. (*p* value)	SMOG Coef. (*p* value)
AudCopm	?	−2.611***	−4.504**	−1.971***	−1.664**	−1.885	−0.569*
		(0.003)	(0.034)	(0.001)	(0.045)	(0.049)	(0.074)
Intercept		Included	Included	Included	Included	Included	Included
Industry FE		Included	Included	Included	Included	Included	Included
Adj. *R*-square		0.121	0.168	0.146	0.097	0.154	0.115
F		5.561***	7.671***	6.642***	3.108***	2.921***	3.559***
Observations		796	796	796	254	254	254

Panel B. Regressions of Readability on Audit Market Competition in Private Audit Firms (H2, n = 816)

Dependent variables		Non-Changed Auditor (n = 567)			Changed Auditor (n = 249)		
Variables	P. sign	Fog Coef. (*p* value)	FRE Coef. (*p* value)	SMOG Coef. (*p* value)	Fog Coef. (*p* value)	FRE Coef. (*p* value)	SMOG Coef. (*p* value)
AudCopm	?	−2.329***	−8.074**	−1.866**	−1.156*	−6.255*	−0.915*
		(0.018)	(0.046)	(0.013)	(0.056)	(0.073)	(0.067)
Intercept		Included	Included	Included	Included	Included	Included
Industry FE		Included	Included	Included	Included	Included	Included
Adj. *R*-square		0.143	0.167	0.171	0.116	0.157	0.126
F		5.100***	5.921***	6.089***	3.141***	3.002***	3.610***
Observations		567	567	567	249	249	249

Note(s): *, ** and *** denote significance at the 10, 5, and 1% levels, respectively
Source(s): Table created by author

Table 8. Regression results of readability on audit market competition by considering auditor change

significant difference. Lastly, for *SMOG*, the chi-square was 4.67, yielding a *p* value of 0.031, again indicating a significant difference. In private firms, for the *Fog* index, the calculated chi-square was 6.76, corresponding to a *p* value of 0.009, indicating a statistically significant difference in the coefficients. For *FRE*, the chi-square was 3.53 with a *p* value of 0.060, showing a marginally significant difference. Lastly, for *SMOG*, the chi-square was 5.01, yielding a *p* value of 0.025, again indicating a significant difference. These findings support the conclusion that the relationship between audit market competition and audit report readability is stronger in firms without experiencing auditor change, and this relationship is particularly robust for private audit firms.

From an economic significance perspective, these findings suggest that auditor changes, which may occur due to competitive pressures, can influence the relationship between audit market competition and audit report readability. The stronger relationship observed in firms without auditor change implies that stability in auditor-client relationships may enhance the effect of competition on audit report readability, particularly in the private audit firm sector. As a result, these findings could have implications for policymaking and the audit industry, highlighting the potential benefits of promoting a competitive environment that encourages both stable auditor-client relationships and enhanced audit report readability.

4.4.2 Audit market size impact. Previous studies have shown that the effect of audit market concentration on the level of audit fees depends on the size of the audit market (Eshleman, 2013). When the audit market contains fewer clients and/or is small, audit fees increase (decreasing) in audit market concentration (competition) and vice versa. Therefore,

this section's analysis aims to investigate whether the relationship between audit market competition and audit report readability also depends on the size of the audit market. To compute audit market size, the scaled quintile rank of the size of the audit market is used, where audit market size is calculated as the sum of the total assets of a client in the audit market. The sample is then divided into two subsamples by median. This process is repeated for the second hypothesis in private firms as well.

The analysis indicates that when the audit market size is small, there is a negative and significant relationship between audit market competition and readability measures for both the full sample and private audit firms. The results in Table 9 show that in the small audit market group, there is a strong negative and statistically significant association between *AudComp* and readability measures, including the *Fog* index (coefficient = −7.165; $p < 0.01$), *FRE* (coefficient = −8.284; $p < 0.001$) and *SMOG* (coefficient = −5.716; $p < 0.01$). Conversely, in the large audit market group, the association between *AudComp* and readability measures is weaker, with the *Fog* index (coefficient = −5.047; $p < 0.05$), *FRE* (coefficient = −6.124; $p < 0.10$) and *SMOG* (coefficient = −0.866; $p > 0.1$) not always achieving statistical significance. In the seemingly unrelated estimation test for the full sample, the chi-square scores for *Fog* index, *FRE* and *SMOG* were 6.05, 4.22 and 5.36 respectively, with corresponding *p* values of 0.014, 0.040 and 0.021. This suggests that the coefficients are significantly different between the small and large audit market groups.

For private audit firms, the small audit market group exhibits a strong negative and significant association between *AudComp* and readability measures, including the *Fog* index

Panel A. Regressions of Readability on Audit Market Competition (H1, n = 1050)

		Small Audit Market (n = 535)			Large Audit Market (n = 515)		
Dependent variables		Fog	FRE	SMOG	Fog	FRE	SMOG
Variables	P. Sign	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)
AudCopm	?	−7.165*** (0.005)	−8.284** (0.000)	−5.716*** (0.004)	−5.047** (0.032)	−6.124* (0.067)	−0.866 (0.375)
Intercept		Included	Included	Included	Included	Included	Included
Industry FE		Included	Included	Included	Included	Included	Included
Adj. *R*-square		0.198	0.133	0.156	0.112	0.106	0.152
F		6.730***	4.886***	5.690***	5.047***	3.906***	5.662***
Observations		535	535	535	515	515	515

Panel B. Regressions of Readability on Audit Market Competition in Private Audit Firms (H2, n = 816)

		Small Audit Market (n = 441)			Large Audit Market (n = 374)		
Dependent variables		Fog	FRE	SMOG	Fog	FRE	SMOG
Variables	P. sign	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)	Coef. (*p* value)
AudCopm	?	−4.445*** (0.004)	−7.739*** (0.004)	−2.914** (0.012)	−2.093* (0.051)	−5.301 (0.316)	−1.391* (0.072)
Intercept		Included	Included	Included	Included	Included	Included
Industry FE		Included	Included	Included	Included	Included	Included
Adj. *R*-square		0.198	0.296	0.237	0.164	0.108	0.190
F		5.932***	9.396**	7.196***	4.852***	3.389***	5.6616***
Observations		441	441	441	375	375	375

Note(s): *, ** and *** denote significance at the 10, 5 and 1% levels, respectively
Source(s): Table created by author

Table 9.
Regression results of readability on audit market competition by considering audit market size

(coefficient = −4.445; $p < 0.01$), *FRE* (coefficient = −7.739; $p < 0.01$) and *SMOG* (coefficient = −2.914; $p < 0.05$). On the other hand, for the large audit market group, only the *Fog* index (coefficient = −2.093; $p < 0.05$) and *SMOG* (coefficient = −1.391; $p < 0.10$) are significantly associated with *AudComp*. In the seemingly unrelated estimation test for private audit firms, the chi-square scores for *Fog* index, *FRE* and *SMOG* were 6.84, 4.71 and 5.91 respectively, with corresponding p values of 0.009, 0.030 and 0.015. This indicates that the coefficients are significantly different between the small and large audit market groups within private audit firms.

These results suggest that audit market size is a significant factor in the relationship between audit market competition and audit report readability. In particular, the impact of competition on readability appears to be stronger in smaller audit markets, both in the full sample and within private audit firms. From an economic standpoint, these findings suggest that smaller audit markets could benefit more from increased competition, resulting in improved audit report readability. This can have practical implications for businesses operating in these markets, as enhanced readability of audit reports can facilitate better communication with stakeholders, improve decision-making and potentially reduce the risk of financial misstatements or fraud. For regulators and policymakers, these results highlight the need for tailored strategies to foster competition in smaller audit markets, as the benefits of increased competition in audit report readability appear more significant in these contexts. This may involve encouraging the entry of new audit firms, promoting transparency or implementing policies that specifically target the unique characteristics of smaller audit markets. By doing so, the economic benefits of improved audit report readability can be more effectively realized in these smaller markets, ultimately contributing to the overall health and stability of the financial ecosystem.

4.4.3 Controlling for firm-specific effects. In addition, the primary regression model for both hypotheses is re-estimated to control for 'omitted time-invariant firm-specific factors' (Ball *et al.*, 2012). This analysis is expected to lower the power of the tests. Nevertheless, it tests whether the relations between audit reports' readability and audit market competition could be attributable to time-invariant factors. Untabulated results indicate that the coefficients on *AudComp* continue to be negative and significant for the whole sample and private audit firms, revealing that the effects of *AudType* and *AudComp* on audit reports readability are robust to the inclusion of firm fixed effects.

5. Conclusion and remarks

Readability is critical in evaluating and understanding textual narratives and making optimal decisions. As a result, regulators and policymakers have initiated projects to enhance the readability of annual reports (Hesarzadeh and Rajabalizadeh, 2019; Hasan, 2020). Although the readability of financial reports is a sign of accounting quality (Biddle *et al.*, 2009) and previous studies examine its effect on investors' decisions (Asay *et al.*, 2017), financial analysts (Lehavy *et al.*, 2011) and informational efficiency (Hesarzadeh and Rajabalizadeh, 2019), only a few studies explore the textual features of audit reports, another critical source of financial information (Pound, 1981; Smith, 2019; Fakhfakh, 2016; Zeng *et al.*, 2022). Increased audit market competition can improve audit quality by enhancing auditor independence and enabling auditors to reduce audit costs while putting more effort into their work (Kallapur *et al.*, 2010; Newton *et al.*, 2013). Conversely, it can reduce audit quality by weakening auditors' incentives to improve service quality and making them more overconfident and complacent (Boone *et al.*, 2012; Francis *et al.*, 2013). This study examines the effect of competition in the audit market on audit report readability, focusing on Iran's unique audit market, where competition among audit firms is more intense than in developed countries due to the liberalization of the Iranian audit market in 2001 (MohammadRezaei and Mohd-Saleh, 2018).

The regression analysis of 1,050 firm-years from 2012 to 2018 in Iran reveals that increased audit market competition is positively associated with the readability of audit reports. This relationship is stronger among private audit firms, where competition is more intense. The study's findings are robust to alternative measures of readability. Further analysis shows that the positive effect of competition on audit report readability is more pronounced when the auditor remains unchanged, and the size of the audit market is small.

This study lays the groundwork for future research by focusing on the effects of audit market competition on audit report readability. Future studies could explore the impact of other factors on audit report readability, such as audit fees, partners' narcissism and audit-switching behavior. As audit market concentration has increased in most markets following audit firm mergers, examining the effect of audit market structure on audit report readability is necessary. Additionally, future research could investigate the role of audit quality differentiation in influencing the relationship between audit market structure and audit report readability. The psychological aspects of audit partners who sign audit reports might also affect audit report readability. Moreover, the level of audit report readability can be influenced by the linguistic complexity of describing audit processes (Loughran and Mcdonald, 2016) or by professional audit firms' weak writing standards. If low readability is solely due to poor writing skills, potential solutions include increased corporate communication training for accounting professionals. Most contemporary accounting text analytics research excludes auditing, auditors and audit firms from the study (Loughran and Mcdonald, 2016), which appears unjustified given their significance in financial markets. Therefore, this study is among the first to apply corpus linguistic and natural language processing methods of text analysis to auditor reports in a unique emerging market like Iran.

Lastly, this research's outcomes are limited to readability measures, a unidimensional construct. Future studies could investigate different textual characteristics (e.g. text cohesion) in financial or audit-related texts using advanced readability metrics (e.g. Coh-Metrix). Furthermore, additional research should be conducted to establish and evaluate readability criteria for accounting and auditing practice.

Notes

1. This Act was not rendered active until the establishment of the IACPA in 2001.
2. In Iran, the audit market is indeed an integrated market where both private and state auditors actively compete for clients, including large public companies and state-owned enterprises. The growing presence of private audit firms and a more competitive regulatory environment have facilitated this integrated market, allowing both private and state auditors to serve clients across various segments of the market.
3. WWW.CODAL.ir is the website where the annual financial reports are sourced. Codal is owned by the SEO of Iran.
4. Calculating the HHI at the industry level may not be suitable for the Iranian context due to the limited number of observations in total and specifically within each industry. With a restricted number of observations, industry-level HHI calculations may yield less reliable and less informative results, as the index values could be disproportionately influenced by a small number of firms. Additionally, the low number of observations could lead to higher estimation uncertainty and less precise inferences. The insightful comment from the reviewer highlights an important aspect of the analysis. Given the limitations of industry-level calculations in the Iranian context, focusing on the market-level HHI measure is a more appropriate and informative approach for the study.
5. In this study, the total assets of clients are employed as a measure of an audit firm's size, owing to its advantages over alternative measures such as audit fees, the number of clients and total sales.

The total assets of clients more effectively reflect the complexity and scope of audit work and provide a steadier measure over time. This approach also mitigates size bias and better represents market power by capturing the overall scale of the firm's audit engagements. In the Iranian context, audit fees may not be an appropriate measure, as they could be missing or challenging to obtain due to varying disclosure requirements or reporting practices.

6. The author expresses gratitude for the reviewer's insightful comment. It has been noted that the variable of interest, audit market competition, being at the market level and only exhibiting time-series variations, could potentially be absorbed by year fixed effects. This could lead to the coefficient on the competition measure being rendered meaningless or, in certain circumstances, not being estimable. Given this potential issue, the author recognizes the need to exclude year fixed effects from the baseline regression model, while the inclusion of industry fixed effects remains acceptable.
7. Owing to the absence of international audit firms operating in Iran, the type of auditors is controlled as state versus private auditors (MohammadRezaei and Mohd-Saleh, 2018) in the first hypothesis. For the second hypothesis, the main hypothesis is tested within the context of private audit firms, where competition is more intense.
8. Private audit firms can be categorized into two groups: trustee private auditors of the SEO and non-trustee private auditors. Only trustee private audit firms can provide audit services to firms listed on the TSE. Approximately half of the private audit firms that are members of the IACPA are accepted by the SEO as trustee auditors based on the quality criteria established by the SEO (MohammadRezaei and Mohd-Saleh, 2018). The number of private audit firms in this study consists only of private auditors accepted by the SEO as trustee audit firms.
9. In untabulated results, two common readability indexes related to the length of audit reports are considered, specifically the natural logarithm of the words and the natural logarithm of the sentences in audit reports. Although the directions of these measures are consistent with the main results (higher competition increases the length of the reports, making them less readable), they are statistically insignificant.
10. Thanks for the reviewer's comment suggesting this method. Please see this link: https://stats.oarc.ucla.edu/stata/code/comparing-regression-coefficients-across-groups-using-suest/
11. It's important to note that even for the *FRE* and *SMOG* measures in state audit firms, where the coefficient of audit market competition is not significant ($p > 0.1$ and $p > 0.6$, respectively), the comparison of coefficients between the groups is conducted. This is done to provide a complete picture of the differential effects of competition across all measures of readability. Although the coefficient of audit market competition is not significant for the *FRE* and *SMOG* measures among state audit firms, the comparison with private audit firms still yielded a marginally significant result. This suggests that while the effect of competition may not be significant within state audit firms, the impact of competition varies significantly between the two types of firms. Please note that that performing a comparison of coefficients test when one of the coefficients is not significant should be interpreted with caution. The test might reveal a significant difference, suggesting varying effects of the independent variable across groups. However, because the effect is not significant in one of the groups (state audit firms, in this case), this finding primarily reflects the significant effect in the other group (private audit firms) rather than a differential effect *per se*.

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