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The impact of narcissism, self-confidence and auditor's characteristics on audit report readability

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Abstract

Purpose – The present study aims to assess the impact of narcissism, self-confidence and auditor's characteristics on audit report readability for companies listed on the Tehran Stock Exchange.

Design/methodology/approach – The study's statistical population comprises firms listed on the Tehran Stock Exchange. The present research used a systematic elimination method, and 1,162 firm-year observations were obtained for seven years from 2012 to 2018. Three variables including auditor tenure, audit fee and audit specialization are used for measuring auditing features. The Fog index is used as a proxy for measuring audit report readability. In addition, in this paper, four regressions, including fixed effects, random effects, pooled and $T+1$, are used to estimate reliable coefficients.

Findings – The findings show a negative and significant relationship between auditor's characteristics (tenure, fee and specialization) and audit report readability. Moreover, the variables of the auditor's narcissism, self-confidence and mandatory auditor change have a positive and significant association with audit report readability. This study lends support to the theories of personality disorder and behavioral decision.

Originality/value – Since narcissism and self-confidence are two characteristics that shape an individual's character and personality, some involved behavioral factors in auditors' characteristics contribute to their decisions. The effects of these should be detected to enhance the decision-making process. The said factors significantly impact audit report readability. Hence, this paper attempts to assess the effect of the said factors on audit report readability.

Keywords Narcissism, Self-confidence, Auditor's characteristics, Audit report readability

Paper type Research paper

1. Introduction

The financial crisis of 2008–2009 led to wide criticism of financial reporting and external auditors' reporting of various entities. There have always been two significant challenges ahead of firm managers relative to financial reporting. The first one is balancing financial reporting transparency and avoiding presenting excessive information (due to misuse of

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rivals). The other is how much information should be delivered, for whom and when (Audousset-Coulier, Jeny, & Jiang, 2016). Given the presence of the financial reporting process, its objective (presenting information to users), and regarding the stance of firms (publishing information as least as possible) and also the costs of financial reporting, including information collection and processing, legal, political and competition costs and costs that limit the behavior of managers, in some cases, it is observed that managers have some confidential information about the firm that brings about information asymmetry. Information asymmetry is one of the considerable criteria for investors who contribute enormously to business firm investments. From most opinion leaders, information asymmetry is the main contributing factor to the stock market's quality. Any logical decision on buying and selling shares requires accurate information about the quality of the stock market. Audit reports can play a significant role in the process. Financial reporting quality and disclosure policy influence the amount of firm transparency. Besides, firms with no financial health may defer the bad news, leading to a delay in presenting audit reports and audited financial statements. Li (2008) reported that traditional auditor reports fail to satisfy financial statement users' needs as they lack communication quality and informative value. These factors lead to an audit expectations gap between the auditors' perception of their responsibilities and the expectations of financial statement users (Bedard *et al.*, 2012, 2016). Annual and auditor reports are characterized by increased length and complexity affecting various stakeholders' decision-making entities (Velte, 2020). For example, finance and psychology-related research demonstrate biases in the investors' approach to how the information is conveyed to them (Aymen, Sourour, & Badreddine, 2018; Bonsall & Miller, 2017; Dalwai, Chinnasamy, & Mohammadi Syeeda, 2021; Merkl-Davies, Brennan, & McLeay, 2011). Prior studies have reported that auditor reports are less or very difficult to read, and their readability varies between audit firms (Barnett & Leoffler, 1979; Boritz, Hayes, & Timoshenko, 2016; Velte, 2018, 2020). The audit report source of the business's annual financial reports is essential, and this report is an inseparable part of the relationship between financial statement users and business economic information (Salehi, Zimon, & Seifzadeh, 2022a). Thus, readability is a critical feature of auditor reports, and it would be useful to investigate the impact of auditor characteristics on this feature.

According to the theory of personality disorders, narcissism refers to a mental and psychological state. One ignores the external setting and conditions of others due to excessive attention to oneself. Narcissism typically includes some beliefs and conditions that include self-arrogance, high expectations of others, justification of one's mistakes, blaming others' and devaluing others compared with oneself. Narcissistic people are holistic, make others do a detailed analysis, and when they are not satisfied with the regulations, they ignore them and even change them to their benefit. Hence, narcissism is like a double-edged sword that is an excessive amount or an extremely small amount that disrupts the balance (Salehi, Rouhi, Usefi Moghadam, & Faramarzi, 2022b). Since narcissism is a personality characteristic with some signs like the influence of personal desires, asking from others, and prejudice in cognitive processing and contributes to the formation of personality and shapes the behaviors of an individual, some of the involved behavioral factors in the personality of auditors may direct their decisions, the identification of which can enhance the decision-making process. One factor is narcissism and self-confidence among auditors that can influence financial reporting quality, including the readability of annexed notes to financial statements.

The auditing process and its associated auditor efforts are obscure to the public. Thus several features are chosen as proxies to measure this effect (Xu, Fernando, Tam, & Zhang, 2020). For example, auditor fees are interpreted for audit quality, risk and effort (Simunic, 1984). The extant literature findings suggest that lower financial report readability is associated with higher audit risk resulting in higher audit fees (Li, 2008; Lo, Ramos, & Rogo, 2017). Auditor tenure is another feature reported to affect audit quality. Prior studies have

suggested that the increase in the length of auditor tenure leads to either a decline in audit quality (González-Díaz, García-Fernández, & López-Díaz, 2015) or increased audit quality (Ghosh & Moon, 2005; Knechel & Vanstraelen, 2007; Jackson, Moldrich, & Roebuck, 2008). Audit firm rotation improves audit quality as the client cannot influence the auditor (Elder, Lowensohn, & Reck, 2015). Alternatively, it may result in substandard audit reports as the auditor does not know the client too well (Carcello & Nagy, 2004; Stanley & DeZoort, 2007). Bae, Choi, and Lee (2019) suggest auditor industry specialization developed through longer engagement hours results in higher audit quality.

Since narcissism and self-confidence are two personality characteristics effective in shaping personality and behavior, some behavioral factors involved in auditors' personalities may lead to a bias in their decisions and affect audit report quality. Assessing the narcissism and self-confidence of auditors is also among the challenging and attractive issues in financial reporting. It is considered a leading issue regarding the study's practicality in answering investors' and managers' information needs. Thus, the paper is concerned with the effect of factors such as narcissism, self-confidence and auditor characteristics on the auditor's report readability. To the best of the authors' knowledge, this has not been investigated in extant literature. Using 166 non-financial firms listed on Tehran Stock Exchange, the data are collected from 2012 to 2018. The results suggest that higher auditor tenure, fee and specialization are associated with less readable audit reports. In contrast, auditor narcissism, self-confidence and mandatory auditor switching increase audit report readability for listed firms in Iran. This study offers insights for policymakers seeking to enhance readability and reduce the annual reports. This study can also inform whether regulators, investors, analysts, auditors and other stakeholders need to consider narcissism, self-confidence and auditor's characteristics in comprehending the audit report readability.

This study makes several contributions. The results will also help existing theoretical literature on related areas. Moreover, firms' auditor reports have always been significant resources for making relatively related and accurate decisions. This empirical evidence is critical for firms' management to exercise mandatory auditor change to improve auditor reports' readability. The standard setters and market regulators get an insight into the determinants of auditor report readability. Finally, institutional investors would benefit from the findings of this study as the auditor arrangements for listed firms in Iran can effectively mitigate information asymmetry. The results of this paper will help to develop science and knowledge in this field and fill the existing literature gap to show the impact of narcissism, self-confidence and auditor's characteristics on audit report readability.

The research paper is organized as follows. Section 2 discusses the literature review and hypothesis development for the variables selected in this study. Section 3 presents the research methodology, including data collection, research model and used variables. Section 4 discusses the results and discussion for the research model. Section 5 outlines the study's conclusion, recommendations and limitations.

2. Theoretical principles and hypothesis development

2.1 Auditing in Iran

The role and nature of auditing are introduced by dominant uncertainties and doubts about reported accounting information quality. Auditing is at the forefront of evaluation, making an opinion about the appropriateness, and finally, giving credit to management claims in financial statements. Society expects the auditing profession to present reports that enhance the reliability and timeliness of disclosed accounting information. If auditing is a supervisory tool with various roles and assuming other conditions are fixed, in that case, an audit report on financial statements should gradually enhance information disclosure quality by increasing the timeliness of accounting information disclosure (Araj, 2015). To maintain professional fame and

avoid lawsuits against themselves, auditors seek to raise the audit quality. The quality that determines the audit performance is the function of several factors, including the auditor's capabilities (like knowledge, experience, adaptation power and technical efficiency) and professional implementation (like independence, objectivity, professional care, conflict of interests and judgment) (Zalata & Roberts, 2017). Financial statements are the most important source of information to reflect the performance results, financial condition and cash flows of business firms, and financial reporting readability are useful for the users (Abernathy, Guo, Kubick, & Masli, 2019). Firms in more corrupt regions tend to disclose less readable financial reports. These firms having more able managers are more likely to obfuscate information in annual reports (Xu, Dao, Wu, & Sun, 2022). However, a few studies have assessed audit report readability. So, the findings of this study may be of interest to regulators seeking out factors influencing firms' audit report readability.

2.2 Theoretical justification

This research is investigated from a multi-theoretical lens investigating the impact of auditor narcissism, self-confidence and characteristics on auditor report readability using communication theory, social identity theory and behavioral decision theory. Audit reports are a communication tool between its users and auditors. The report indicates the auditor's examination scope and the conclusions made on the financial statement's appropriateness (Libby, 1979). From a communication theory perspective, the audit report constitutes messages that the auditor, as a sender, wants to communicate with the receivers, the companies and stakeholders (Suttipun, 2022). The quality of communication is measured in readability (Li, 2008) or content and the tone of audit reports (Loughran & McDonald, 2016). Readability is the effective communication of valuation-relevant information (Loughran & McDonald, 2014), and audit report communications' effectiveness is partly a function of ease of readability (Salehi *et al.*, 2022a). Readability and understanding of reports are usually of particular complexity (Habib & Hasan, 2020). Since this issue is so important that some researchers have referred to it as a bridge between users and useful decision-making (Setayesh, Kazemnejad, & Zolfaghari, 2012), readability has been considered an essential factor in this study. Prior studies that have used communication theory report traditional annual and audit reports that are difficult to read and offer less user value (Smith & Smith, 1971; Li, 2008). Alternatively, auditor type and fees are positively associated with the level of key audit matters (Suttipun, 2022).

Tajfel and Turner (1979) proposed the social identity theory, in which individuals establish an association with those individuals or firms that can enhance their image and prestige. This behavior extends to narcissists' motivation to associate themselves with other narcissists wielding power in a group or organization (Grosz, Leckelt, & Back, 2020). Extant literature based on social identity theory reported an increase in auditor identity with audit clients increases auditors' probability of succumbing to client pressure for income-increasing accounting treatments (Koch & Salterio, 2017; Daoust & Malsch, 2020). Bauer (2014) argues auditor skepticism reduces when there is greater auditor identification with the client leading to the auditor issuing a "benefit of the doubt" on contentious accounting issues. Johnson, Lowe and Reckers (2021) also used social identity theory to report narcissist auditors had lower risk assessment when the CFO had high verbal narcissism.

Behavioral decision theory suggests performance is ascertained by an individual's experience, knowledge, and ability (Bonner & Lewis, 1990; Libby & Tan, 1995). Auditors gain more experience with longer engagement hours, greater audit practice opportunities and feedback from the reviewers and the external environment. Compared to the auditor with lesser experience, experienced auditors are better known for consistent regulations and substantive decisions (Bedard, 1991). According to Francis and Yu (2009), the experienced auditor ensures

the clients' financial statements before being issued. Thus, an auditor's experience is positively associated with audit quality (Cheng, Liu, & Chien, 2009; Ye, Cheng, & Gao, 2014).

2.3 Hypotheses development

2.3.1 Auditor narcissism. The narcissism of organizational leaders is one of the study fields in organizational leadership. There are various negative consequences for narcissism, including failure of other managers and staff, the possibility of misusing others and immoral behaviors, ignoring the organization's external realities and environmental threats and destroying the organizational trust and relations (Rosenthal & Pittinsky, 2006). A narcissistic auditor considers himself the pivotal figure for values and firm achievements and is not afraid of financial reports' failure. Arrogance and pride will cause them to resist constructive suggestions, give more credit to their success and blame others for failure. Such characteristics will cause problems with their personal and organizational relations. That may ignore necessary organizational inputs, including wise advice, environmental changes (like changes in the market) and rivals' threats. Moreover, efficient staff may be isolated under such circumstances. The absence of empathy and understanding in narcissistic auditors has made them unpopular among the personnel. Since they need admiration and subservience, obsequious staffs are vital to them. Narcissistic auditors are willing to carry out extraordinary measures to be outstanding, among others. They show a high risk-taking ability to maintain control, power, authority and borderless significance. The resultant narcissism from such behavioral characteristics led to a massive business crisis (Church, Dai, Kuang, & Liu, 2020). Kent, Munro, and Gambling (2006) studied the effect of psychological characteristics on the relationship between auditors' specialization and auditor's judgment. They figured out that 14 features contribute to the auditor's judgment in all auditing procedures. Based on the theory of personality disorder, psychological features include accountability, trust, accepting changes, specialized knowledge, stress control, creativity, etc.

H1. There is a significant relationship between auditors' narcissism and audit report readability.

2.3.2 Auditor self-confidence. Self-confidence in accounting is among the major tools and executive features. Unfortunately, an excessive number of people with a high experience level suffer from a lower self-confidence percentage. Although they work assiduously, the success path becomes tougher. A person with stronger self-confidence can deal with difficulties more easily and is more willing to explore the depth of realities and vicissitudes. For example, a successful accountant, auditor and financial manager are not afraid of problems and try endlessly to save more information every day (Nakashima & Ziebart, 2015). On the other hand, the false self-confidence that is a behavioral feature in auditing can have an adverse effect (Salehi *et al.*, 2022b). For example, Gizyatova (2015) shows that an auditor's self-confidence would lead to insufficient evidence collection. Based on the theory of personality disorder, the second hypothesis of the study is as follows:

H2. There is a significant relationship between auditors' confidence and audit report readability.

2.3.3 Auditor characteristics. Auditing and auditor's characteristics play a significant role in substantiating financial statements. One such feature is the specialization and experience of the auditor. For example, Chen, Lin, and Lin (2008) state that authorized and specialized audit firms positively affect the market share's gradual growth. Moreover, their study results show that the discretionary accruals of employers of industry-specialized auditors are significantly lower than that of nonspecialized industry auditors. Libby and Frederick (1990) show that the more auditors experience, the more they understand different available distortions in

financial statements. Hence, the quality of the auditor's decision will improve by gaining experience in the field. Thus, the more experienced the auditor, the better will be the provided services to society. Craswell, Francis, and Taylor (1995) also declare that experienced auditors embark on high-quality audits to maintain their credit and fame. One of the other auditing features is the audit fee. Different studies show that audit fee reflects the effective economic cost of auditing within an economy. The price relies on the size, work complexity, risk and other firm features under study and its commercial setting (Cho, Kwon, & Krishnan, 2021). Low audit quality decreases the trust of financial statement users. That not only leads to a failure to achieve the set objectives, but reduces the credibility of the audit process in broad terms, hinders the appropriate allocation of capital in the securities market, and enhances the capital costs and financial supply (Inaam & Khamoussi, 2016). Cho, Hyeon, Jung, and Lee (2022) investigated the auditors' responses to the readability of annual reports. They found hard-to-read annual reports positively associated with audit fees and hours. However, no empirical association exists between annual report readability and hourly fee rates. These findings imply that while auditors exert additional effort to reduce the audit risk embedded in unclear annual reports, they do not charge a higher fee premium. Auditors' tenure is one of the other features of auditing. Several studies examined the effect of audit tenure length on audit quality and financial reporting quality (e.g. Deis & Giroux, 1992). The studies yield different results concerning the countries under study's legal, social, economic, and cultural conditions. For example, Davis, Soo, and Trompeter (2002) indicate that abnormal accruals for earnings management are more frequent in firms with long-term auditing periods.

Besides, Deis and Giroux (1992) observe that audit quality decreases and increases audit tenure. One of the other auditing features is the mandatory change of auditors. From advocates' view, mandatory auditor change and long auditor tenure may lower impartiality and hurt independence. A decrease in audit quality due to the decline of accuracy in performing control and content tests comes from the similarity between the auditor and the dominant condition. Selecting an auditor is a significant decision about firm age, and deciding about auditor change should be made carelessly (Buntara & Adhariani, 2019). However, auditor change can result from a change in current condition (some irrelevant to the previous audit firm), like a change in top management or disagreement and special issues. So, changing auditors' reasons is not necessarily related to an audit firm's specifications and selecting a new auditor (Beattie & Fearnley, 2002). Based on behavioral decision theory and the effect of auditor's characteristics on audit and reporting quality, it is expected the auditors' characteristics affect the readability of the auditor's report, so hypotheses 3–6 of the study are as follows:

H3. There is a significant relationship between auditors' specialization and audit report readability.

H4. There is a significant relationship between audit fees and audit report readability.

H5. There is a significant relationship between auditors' tenure and audit report readability.

H6. There is a significant relationship between mandatory auditor change and audit report readability.

3. Research methodology

3.1 Data collection

The study's statistical population includes all listed firms on the Tehran Stock Exchange. The systematic elimination method is used, and data are selected for seven years (2012–2018).

In this paper, firms under study were selected using the screening method based on the following conditions:

(1) They should not be affiliated with investment companies, financial intermediaries, holdings, banks, insurance and leasing; and,

(2) Their financial year-end should be set in March.

Given the above conditions, a total number of 166 firms are selected.

3.2 Empirical model and data analysis

Model 1 is used for testing research hypotheses:

$$ART_{it} = \alpha_0 + \alpha_1 AuditNA_{it} + \alpha_2 AuditCON_{it} + \alpha_3 AuditSIZE_{it} + \alpha_4 AuditCHANGE_{it} + \alpha_5 AuditFEE_{it} + \alpha_6 AuditIND_{it} + \alpha_7 AuditTENURE_{it} + \alpha_8 MB_{it} + \alpha_9 SIZE_{it} + \alpha_{10} LEV_{it} + \alpha_{11} ROA_{it} + \alpha_{12} AGE_{it} + \alpha_{13} GROWTH_{it} + Year_{it} + Industry_{it} + \varepsilon_{it} \quad (1)$$

To estimate reliable coefficients, this paper uses four regressions, including fixed effects, random effects, pooled and $T+1$. The statistical analysis for estimating the model related to narcissism, self-confidence, auditor's characteristics and auditor's report readability is done using the Stata software.

3.3 Variables measurement

3.3.1 The dependent variable of the study. ART: the variable of auditor's report readability, for the measurement of which, according to similar studies (e.g. Lim, Chalmers, & Hanlon, 2018; You & Zhang, 2009; Ajina, Sougne, & Lakhal, 2015) Fog index was used which has been used widely and has seen increased usage in the accounting literature (Lo *et al.*, 2017). The Fog index is a function of two variables of sentence length (based on words) and complicated words (defined in the form of the number of three or multi-syllabus words) and is calculated as follows:

$$\text{FOGIND} = (\text{average sentence length} + \text{percentage of complex words}) \times 0.4$$

A higher Fog index indicates that an annual report is harder to read (Cho *et al.*, 2022). The process and manner of determining of financial report's level of readability in the above index are as follows:

(1) Selecting a 100-word sample from the beginning, a 100-word sample from the middle and a 100-word sample from the end of the report, randomly.

(2) Counting the number of sentences of each sample.

(3) Determining average sentence length by dividing the number of words into the number of complete sentences of each sample of 100-word.

(4) Counting the number of existing three-syllable and more than three-syllable words (complicated words) in each 100-word text.

(5) Adding the number of complicated words with the average number of words in sentences.

(6) Multiplying the number of complicated words and average words in sentences by the fixed figure of 0.4.

(7) Calculating no. 4, 5 and 6 for two other 100-word samples.

(8) Calculate all three samples' average results by adding and dividing by a number.

The relationship between the Fog index and readability level is as follows: Fog > 18 means the text is not readable and more complicated; 14–18 (hard text), 12–14 (average text), 10–12 (acceptable text) and 8–10 (easy text).

3.3.2 Independent variables of the study.

(1) Auditor narcissism measurement

AuditNA: the variable of auditor narcissism, for which the size of auditors' signature is used. Since signature size correlates with narcissism, we can measure auditor narcissism in a naturally occurring setting (Salehi *et al.*, 2022a; Church *et al.*, 2020). Bigger signatures indicate narcissistic personal characteristics (Salehi *et al.*, 2022a).

(2) Auditor confidence measurement

AuditCON: According to Malmendier and Tate (2005a, b, 2008), to measure managers' overconfidence, the index of surplus investment in assets is used in this paper. It is calculated by dividing the residual of total asset growth regression ($Assets.Gr_{it}$) by sales growth ($Sales.Gr_{it}$). So that if the residual is greater than 0, this index is equal to one; otherwise to zero. This index is based on the fact that managers invest more than their peers in firms whose assets grow at a higher rate than sales.

$$Assets.Gr_{it} = a_0 + a_1 sales.Gr_{it} + \varepsilon_{it} \tag{2}$$

(3) Auditor characteristics measurement

AuditFEE: the variable of audit fee which is obtained from the natural logarithm of the audit fee (Tarighi, Salehi, Moradi, & Zimon, 2022).

AuditIND: auditor industry specialization. This paper assesses auditor industry specialization using the market share approach since it is more applicable in Iran. According to the approach, a specialized industry auditor is considered when he/she obtains a higher proportion of active clients in that industry than his/her rivals. In this approach, market share is obtained by dividing the firm client's total sales in each industry into the same industry's total sales (Minutti-Meza, 2013; Romanus, Maher, & Fleming, 2008).

$$MarketShare_{ik} = \frac{\sum_{j=1}^{J_{ik}} sales_{ijk}}{\sum_{k=1}^{I_k} \sum_{j=1}^{J_{ik}} sales_{ijk}}$$

The numerator is the total sales of all clients of i audit firm in the k industry. The denominator is the total sales of all active firms in the k industry for all audit firms in that industry.

AuditSIZE: the variable is indicative of audit firm size. In this paper, affiliated audit firms with official accounting associations are considered small auditing (small audit firms), so 0 will be assigned to them and the audit organization due to a large number of staff and longer history being considered large auditors and take 1 (Arianpoor & Sahoor, 2022).

AuditTENURE: the variable of auditor tenure is obtained from the years the auditor has worked as an independent auditor (Salehi *et al.*, 2020, 2022a).

AuditCHANGE: The mandatory auditor change variable equals 1 if the auditor has changed; otherwise, 0. (Eshagniya & Salehi, 2017; Salehi *et al.*, 2022a).

3.3.3 Control variables. This study includes several control variables proposed in prior studies (e.g. Salehi *et al.*, 2022a; Church *et al.*, 2020; Dalwai *et al.*, 2021; Suttipun, 2022). In addition, the study includes: return on assets (ROA), which is equal to net profit divided by total assets; firm size (SIZE), the natural logarithm of firm assets; firm age (AGE), which is equal to the time of firm presence in the stock exchange; market value to book value of capital (MB) that is calculated by dividing market value of equity to book value; sales growth (GROWTH) that is equal to the sales of this year minus that of the previous year divided by sales of the previous year; Year, dummy variable for year; Industry, the dummy variable for the industry. The summary of measuring all research variables is presented in Appendix 1.

4. Findings

4.1 Descriptive statistics and correlation analysis

Table 1 illustrates the information related to the research model variables, including the number of observations, mean, standard deviation, minimum and maximum.

As shown in Table 1, the natural logarithm of audit fees by the value of 1401.833 has the highest mean among the variables. The minimum standard deviation is related to the variable of sales growth by 0.123, and the highest standard deviation is for the natural logarithm of audit fee by 1235.795. The minimum value is for the variable of return on equity by −72.696, and the highest value is 121.510 for market value to book value of equity in 2004.

The sensitivity analysis test assesses the relationship between the used variables in model two-by-two, the above matrix's output. Since it analyzes the correlation between the variable and itself, this matrix's diameter is always 1. This means complete correlation and the more the figures closer to 1, the higher the correlation, and the closer the figures are to 0, the lower the correlation. Thus, the correlation interval is between −1 and +1, where negative figures show an inverse correlation and positive figures indicate a direct correlation. Table 2 illustrates the results of the sensitivity analysis of the research variables.

Variable	Mean	Std. dev	Min	Max
ART	48	32.206	0	264
AuditNA	0.269	0.444	0	1
AuditCON	0.547	0.498	0	1
AuditSIZE	0.208	0.406	0	1
AuditCHANGE	0.275	0.447	0	1
AuditFEE	1401.833	1235.795	77	7590
AuditIND	0.5	0.500	0	1
AuditTENURE	3.696	0.355	2.565	4.985
MB	2.494	6.511	−53.218	121.510
SIZE	1.16	4.24	3.660	10.87
LEV	0.659	0.258	0.131	2.658
ROA	0.100	0.163	−1.158	0.622
AGE	41.486	12.006	13	67
GROWTH	0.181	0.123	0.019	0.717

Note(s): Table 1 illustrates the information related to the research model variables, including the number of observations, mean, standard deviation, minimum and maximum. ART is auditor's report readability; AuditNA is auditor narcissism; AuditCON is auditor confidence; AuditSIZE is audit firm size; AuditCHANGE is auditor change; AuditFEE is audit fee; AuditIND is auditor industry specialization; AuditTENURE is auditor tenure; MB is market value to book value of capital; SIZE is firm size; LEV is leverage; ROA is return on assets; AGE is firm's age; GROWTH is sales growth of a firm

Table 1.
The results of descriptive statistics

	ART	AuditNA	AuditCON	AuditSIZE	AuditCHANGE	AuditFEE	AuditIND
ART	1.000						
AuditNA	−0.043	1.000					
AuditCON	0.015	0.026	1.000				
AuditSIZE	−0.011	−0.017	−0.008	1.000			
AuditCHANGE	−0.059	0.037	−0.035	−0.215	1.000		
AuditFEE	−0.037	−0.183	−0.039	0.130	−0.010	1.000	
AuditIND	0.030	−0.064	0.016	0.462	−0.132	0.159	1.000
AuditTENURE	−0.048	0.069	0.022	0.093	0.003	0.097	0.107
MB	0.005	−0.017	0.033	0.104	−0.059	0.017	0.042
SIZE	−0.071	−0.103	−0.067	0.011	0.053	0.048	0.063
LEV	−0.031	0.086	0.004	0.184	0.063	0.077	−0.046
ROA	0.055	−0.144	0.029	−0.074	−0.069	−0.061	0.062
AGE	−0.087	0.031	0.063	0.066	−0.005	0.106	0.022
GROWTH	0.013	−0.075	0.025	−0.046	0.010	0.058	−0.214

	AuditTENURE	MB	SIZE	LEV	ROA	AGE	GROWTH
AuditTENURE	1.000						
MB	0.027	1.000					
SIZE	−0.013	0.027	1.000				
LEV	0.044	−0.051	0.065	1.000			
ROA	−0.047	0.052	−0.066	−0.727	1.000		
AGE	0.798	0.022	−0.030	0.012	0.014	1.000	
GROWTH	−0.046	0.083	0.015	0.098	−0.239	−0.057	1.000

Note(s): Table 2 is a sensitivity analysis test assessing the model's relationship between used variables

Table 2. The results of sensitivity analysis of variables

4.2 Results

Table 3 shows information related to the normality test of the variables' model.

Regarding the normality test results, AuditFEE, AGE, MB, ROA and AuditCON have had no normal distribution, and the mode's remaining variables experienced a normal distribution. There are several methods for normalizing variables, but applying these methods is a factor in the failure of relations among model variables, so they are dismissed. It is specified that all variables are at no unit root level (stationary) by assessing the unit root for variables. The obtained LM statistic for each variable is reported in Table 4.

One of the methods for detecting linearity is using the VIF test. R_j^2 in these two criteria, the coefficient of determination of jth descriptive regression on other descriptive variables. The linearity is probable if the tolerance is smaller than 0.2 or VIF is larger than 10. Table 5 depicts the results of the test.

Variable	Level	Variable	Level
ART	0.627	AuditNA	1.000
AuditCON	0.000	AuditSIZE	1.000
AuditCHANGE	1.000	SIZE	0.326
AuditIND	1.000	AuditFEE	0.080
AuditTENURE	0.502	GROWTH	0.182
ROA	0.094	LEV	0.509
MB	0.008	AGE	0.087

Note(s): Table 3 shows information related to the normality test of the variables' model

Table 3. The results of the normality test of variables

To estimate the model, first, we should analyze whether the data are pooled or panel using the *F* test. This test's null hypothesis expresses that data are pooled, and hypothesis 1 declares that data are panel. After performing the *F* test, H0 is rejected. The question is that based on which models of fixed or random effects, the model is analyzable, determined by the Hausman test. The null hypothesis concerning the pooled data is ejected regarding the pooled test results reported in Table 6. Hence, the model with panel data should be used to estimate the model's coefficients.

According to Table 7, the Hausman test statistic based on the first model's estimation is equal to 7.20, larger than χ^2 in the table, so the null hypothesis is rejected. Hence, the model with a fixed effect is more appropriate for the research model.

Given the pooled and Hausman tests' results, the study's main model should be estimated using the panel data method with random effects. The results of the estimation are reported in Table 8.

Table 4.
The results of the Hadri unit root test

Variable	Level	Variable	Level
ART	0.9748	AuditNA	0.5214
AuditCON	0.2157	AuditSIZE	0.9647
AuditCHANGE	0.3148	SIZE	0.1182
AuditIND	0.4287	AuditFEE	0.514
AuditTENURE	0.2793	GROWTH	0.7168
ROA	0.9999	LEV	0.2879
MB	0.9812	AGE	0.1723

Note(s): The obtained LM statistic for each variable is reported in Table 4. The null hypothesis is the absence of unit roots in variables

Table 5.
The results of the linearity test

Variable	VIF	1/VIF
AuditTENURE	2.88	0.348
AGE	2.86	0.350
ROA	2.36	0.424
LEV	2.29	0.437
AuditIND	1.44	0.697
AuditSIZE	1.43	0.697
GROWTH	1.17	0.854
AuditNA	1.10	0.909
AuditFEE	1.09	0.913
AuditCHANGE	1.07	0.936
SIZE	1.03	0.968
MB	1.03	0.970
AuditCON	1.02	0.979
Mean VIF	1.60	

Note(s): Table 5 depicts the results of the linearity

Table 6.
The results of the pooled test

	Calculated statistic	Probability level
Research model	8.14	0.000

Note(s): Table 6 is to estimate the model using the *F* test

Table 8 shows a negative and significant relationship between auditors' narcissism and auditor's report readability because the coefficient is −4.469 and significant at a 99% confidence level. On the other hand, since the coefficient of the auditor's self-confidence coefficient is −0.353 and its probability level is 0.000, there is a negative and significant relationship between the auditor's self-confidence and report readability. Besides, since the auditor's mandatory change coefficient is −2.191, there is a negative and significant relationship between mandatory auditor change and the auditor's report readability at 99% confidence. There is also a positive and significant relationship between the auditor's specialization, fee, tenure and auditor's report readability. Since their probability level is 0.004, 0.013 and 0.000 with coefficients of 9.966, 0.007 and 0.131, they are involved in fixed effects regression of year and industry dummy variables. The dummy variables of the industry are eliminated due to linearity and insignificance.

The first regression is estimated using the fixed effects method to confirm and obtain robust results. The results of the estimation are presented in Table 9.

As shown in Table 9, the coefficients of narcissism, self-confidence, and mandatory auditor change are −2.312, −0.0909 and −4.310, respectively, with a probability level of

	Calculated statistic	Probability level
Research model	7.20	0.844

Note(s): Table 7 is the Hausman test. Given the pooled and Hausman tests' obtained results, the study's main model should be estimated using the panel data method with random effects

Table 7.
The results of the Hausman test

Variable	Coefficient	Standard deviation	*Z* statistic	*p*-value
AuditNA	−4.469	1.204	−3.71	0.000
AuditCON	−0.353	0.051	−6.97	0.000
AuditSIZE	−0.015	0.129	−14.85	0.000
AuditCHANGE	−2.191	0.623	−3.52	0.000
AuditFEE	0.007	0.003	2.48	0.013
AuditIND	9.966	3.437	2.90	0.004
AuditTENURE	0.131	0.015	8.45	0.000
MB	−0.048	0.001	1.90	0.057
SIZE	0.005	4.20	−1.18	0.237
LEV	−0.071	0.200	−1.68	0.093
ROA	−0.031	0.231	7.73	0.000
AGE	0.055	0.015	−6.53	0.000
GROWTH	−0.087	0.120	1.70	0.091
_cons	0.013	18.383	2.74	0.006
Adjusted R^2	0.5486			
Wald χ^2	21.52			
p-value	0.063			

Note(s): Table 8 shows the relationship between auditors' narcissism and auditor's report readability because the coefficient is −4.469 and significant at a 99% confidence level. Since the auditor's self-confidence coefficient is −0.353 and its probability level is 0.000, there is a negative and significant relationship between the auditor's self-confidence and report readability. Besides, since the auditor's mandatory change coefficient is −2.191, there is a negative and significant relationship between mandatory auditor change and the auditor's report readability at 99% confidence. There is also a positive and significant relationship between the auditor's specialization, fee, tenure and auditor's report readability. Since their probability level is 0.004, 0.013, and 0.000 with coefficients of 9.966, 0.007 and 0.131, they are involved in fixed effects regression of year and industry dummy variables

Table 8.
The results of model estimation

Variable	Coefficient	Standard deviation	*Z* statistic	*p*-value
AuditNA	−2.312	0.622	−3.72	0.000
AuditCON	−0.909	0.217	−4.19	0.000
AuditSIZE	−1.343	0.236	−5.70	0.000
AuditCHANGE	−4.310	1.201	−3.59	0.000
AuditFEE	0.006	0.003	2.24	0.027
AuditIND	10.714	4.078	2.63	0.009
AuditTENURE	1.407	0.744	1.89	0.059
MB	0.029	0.011	2.61	0.009
SIZE	−4.67	2.69	−1.74	0.083
LEV	−3.714	2.237	−1.66	0.097
ROA	5.533	1.018	5.43	0.000
AGE	0.678	0.744	0.91	0.363
GROWTH	0.174	0.037	4.75	0.000
_cons	27.204	35.190	0.77	0.440
Adjusted R^2	0.5186			
F test	1.80			
p-value	0.042			

Note(s): Table 9 shows the coefficients of narcissism, self-confidence and mandatory auditor change are −2.312, −0.0909 and −4.310, respectively, with a probability level of 0.000. Thus, similar to fixed effects regression, there is a negative and significant relationship between narcissism, self-confidence, mandatory auditor change and auditor report readability. On the other hand, the coefficients of auditor's fee, specialization, and tenure are 0.006, 10.714 and 1.407, with respective probability levels of 0.027, 0.009 and 0.059. Hence, there is a positive and significant relationship between auditor's fee, specialization, tenure and auditor's report readability

Table 9.
The results of fixed effects model estimation

0.000. Thus, similar to fixed effects regression, there is a negative and significant relationship between narcissism, self-confidence, mandatory auditor change and auditor report readability. On the other hand, the coefficients of auditor's fee, specialization and tenure are 0.006, 10.714 and 1.407, with respective probability levels of 0.027, 0.009 and 0.059. Hence, there is a positive and significant relationship between auditor's fee, specialization, tenure and auditor's report readability.

Following the estimation of robust results, the desired model is estimated in the form of OLS data. That means no distinction is considered among existing firms in the data sample. Before estimating the model, we first assessed heterogeneity variance among disruptive components. Regarding the obtained results in Table 10, the chi-square statistic is 21.77 higher than the table value at 99%, so the null hypothesis for variance homogeneity is rejected. Therefore, the first model's disruptive component is heterogeneous variance, and the feasible generalized least squares (FGLS) method is used.

Given the homogeneity variance analysis results for model residuals, the generalized least squares regression method cannot be used due to the violation of the classic hypothesis of variance homogeneity.

Test name	*X*2 statistic	*p*-value
Breusch–Pagan	21.77	0.000

Note(s): Table 10 shows heterogeneity variance among disruptive components. Regarding the obtained results in Table 10, the Chi-Square statistic is 21.77 higher than the table value at 99%, so the null hypothesis for variance homogeneity is rejected. Therefore, the first model's disruptive component is heterogeneous variance

Table 10.
The results of the heterogeneity variance test

As shown in Table 11, the FGLS method is used, the results of which are indicative of a negative and significant relationship between narcissism, self-confidence, and mandatory change of auditor and auditor's report readability because the coefficients of them are negative values of −3.432, −0.645 and −6.368 with a respective probability level of 0.026, 0.001 and 0.021. On the other hand, there is a negative and significant relationship between audit fees and auditor's report readability regarding the probability level of 0.000 and coefficient of −0.009. Moreover, there is a positive and significant relationship between the auditor's specialization and report readability, with a probability level of 0.053 and a coefficient of 2.790 at 90%. Further, there is a positive and significant relationship between auditor tenure and auditor's report readability since the positive value coefficient is 5.865 with a probability level of 0.012.

$T+1$ regression is used to assess the model's delayed effect of descriptive variables on the dependent variable for the auditor's report readability variable. Table 12 shows these variables' effects to obtain the model's coefficients of descriptive variables using the fixed/random effects method. The regression aims to estimate the effect of two key descriptive variables of the auditor's narcissism and self-confidence on the auditor's report readability for the upcoming period. Since the probability level of these two variables is 0.043 and 0.036 and their coefficients are −4.115 and −1.133, the regression results show a negative and significant relationship (at 95% level) between narcissism self-confidence and auditor's report readability of the upcoming period. Further, audit firms' size, mandatory change of auditor, firm size and financial leverage negatively and significantly affect the auditor's report readability in the upcoming period. Moreover, the AuditFEE, auditor industry specialization, market value to book value of capital, return on assets and firm sales growth in the current period have an incremental effect on the auditor's report readability in the upcoming period.

Variable	Coefficient	Standard deviation	Z statistic	p-value
AuditNA	−3.432	1.538	−2.23	0.026
AuditCON	−0.645	0.190	−3.39	0.001
AuditSIZE	−2.763	1.632	−1.69	0.091
AuditCHANGE	−6.368	2.761	−2.31	0.021
AuditFEE	−0.009	0.002	4.15	0.000
AuditIND	2.790	1.445	1.93	0.053
AuditTENURE	5.865	2.327	2.52	0.012
MB	0.052	0.027	1.92	0.055
SIZE	−5.67	3.44	−1.65	0.100
LEV	−4.645	2.646	−1.76	0.079
ROA	15.185	13.518	1.12	0.261
AGE	−0.372	0.202	−1.84	0.066
GROWTH	0.809	0.229	3.53	0.000
_cons	35.926	20.721	1.73	0.083
Wald χ^2	154.28			
p-value	0.000			

Note(s): Table 11 shows the feasible generalized least squares (FGLS) method. The results indicate a negative and significant relationship between narcissism, self-confidence, and mandatory change of auditor and auditor's report readability because their coefficients are negative values of −3.432, −0.645 and −6.368 with respective probability levels of 0.026, 0.001 and 0.021. On the other hand, there is a negative and significant relationship between audit fees and auditor's report readability regarding the probability level of 0.000 and coefficient of −0.009. Moreover, there is a positive and significant relationship between the auditor's specialization and the auditor's report readability, with a probability level of 0.053 and a coefficient of 2.790 at 90%. Further, there is a positive and significant relationship between auditor tenure and auditor's report readability since the positive value coefficient is 5.865 with a probability level of 0.012

Table 11.
The estimation results of the feasible generalized least squares model

Variable	Coefficient	Standard deviation	Z statistic	p-value
AuditNA	−4.115	2.028	−2.03	0.043
AuditCON	−1.133	0.541	−2.10	0.036
AuditSIZE	−5.542	2.882	−1.92	0.055
AuditCHANGE	−2.449	1.118	−2.19	0.036
AuditFEE	0.001	0.001	2.24	0.025
AuditIND	10.124	2.665	3.80	0.000
AuditTENURE	−6.560	4.291	−1.53	0.126
MB	0.171	0.097	1.77	0.077
SIZE	−8.76	5.18	−1.69	0.091
LEV	−0.124	0.029	−4.26	0.000
ROA	1.811	0.719	2.52	0.012
AGE	0.187	0.129	1.45	0.148
GROWTH	0.046	0.026	1.73	0.085
_cons	16.710	13.119	1.27	0.203
Adjusted R^2	0.4204			
Wald χ^2	24.94			
p-value	0.023			

Note(s): Table 12 shows the $T+1$ regression used to assess the model's delayed effect of descriptive variables on the dependent variable. Table 12 shows these variables' effects to obtain the model's coefficients of descriptive variables using the fixed/random effects method. Since the probability level of these two variables is 0.043 and 0.036 and their coefficients are −4.115 and −1.133, the regression results show a negative and significant relationship (at 95% level) between narcissism self-confidence and auditor's report readability of the upcoming period. Further, audit firms' size, mandatory change of auditor, firm size, and financial leverage negatively and significantly affect the auditor's report readability in the upcoming period. Moreover, the AuditFEE, auditor industry specialization, market value to book value of capital, return on assets, and firm sales growth in the current period have an incremental effect on the auditor's report readability in the upcoming period

Table 12.
The results of $T+1$ model estimation for auditor's report readability

5. Discussion and conclusion

This paper uses the generalized least squares regression to assess the relationship between narcissism, self-confidence, auditor characteristics and audit report readability. This paper comprises different aspects of narcissism, self-confidence and auditor's characteristics and their effect on an auditor's report readability by considering the readability quality. All hypotheses of the study are confirmed. The results show a significant relationship between an auditor's narcissism and audit report readability. Narcissism and overconfidence are psychological disorders, showing self-superiority and being at the center of attention (Tamborski, Brown, & Chowning, 2012). These persons gain personal benefits and do not mind the presented rules and regulations, making them complicated (Capalbo, Frino, Lim, Mollica, & Palumbo, 2018). This will decline readability (Bloomfield, 2008). Therefore, it can be claimed that this psychological disorder can influence the audit report's readability. Based on behavioral decision theory, it is expected that the audit report readability plays an important role in understanding by users; however, the report readability reports vary and are influenced by the auditor's and client's characteristics. The results of Abbaszadeh, Salehi and Nasimtoosi (2019) showed the most important variables determining the readability of the audit report are the auditor's size (negative effect), auditing consolidated/not consolidated financial statement (Consolidated one is less readable), size of the client (negative effect), the ratio of market to book value of client (positive effect) and auditor's report type (an adjusted report is less readable). In addition, audit report delay will reduce audit report readability. Xu *et al.* (2020) showed that while poor readability increases the fees charged by the auditor, higher audit fees improve the readability of the financial reports. Cho *et al.* (2022) also showed that the association between annual report readability and audit variables (i.e. audit fees and

hours) is most salient at the initial engagement but becomes weaker as the auditor tenure increases.

According to the obtained results from the study, it is highly recommended to use renowned firms to carry out efficient audits. The existing gap in the variables under study will be filled by achieving the above objectives. The obtained results will also benefit existing theoretical literature in related areas.

The findings of this study have practical implications for managers, shareholders, investors, regulators and auditors. First, the shareholders and investors can note this study's results to understand the association between auditor characteristics and an audit report's readability. For instance, poor financial report readability encumbers firms' stakeholders (Xu *et al.*, 2020); hence, understanding the interaction between audit report readability and audit fees will help auditors and firm managers. Second, the auditors can use the results to monitor audit reports' readability and auditor characteristics affecting the same. Third, auditing firms can monitor the auditor characteristics such as narcissistic behavior and self-confidence to mitigate information asymmetries from difficult-to-read audit reports. Finally, the theoretical contributions of this study are useful for research scholars. There is support for communication, social identity and behavioral decision theories. The increase in narcissistic behavior lowers audit report readability suggesting auditor skepticism and further evidence for social identity theory. Similarly, experienced auditors in Iran improve audit reports' readability in line with the behavioral decision theory. The findings of this study can lead to the literature development of the previous studies concerning audit reporting linguistics and auditor characteristics in emerging markets in Iran and developing countries. In addition, the results of this study can present new ideas for conducting new studies in the field of auditor characteristics and audit report styles of business firms.

The study suffers from some limitations. Given the high volume of auditor's reports, we could not assess the provided texts. In addition, this study considered textual characteristics to calculate audit report readability, and no comprehensive and smart software was available to assess Persian texts' readability. Thus, readability measurement was possible by coding in the PHP language. Still, due to a dictionary's unavailability on the number of Persian words' syllabus, the definition of complex words has inevitably changed from three-syllable words to six or more syllables. Moreover, there was no access to the text files of auditor's reports for measuring the readability before 2012; thus, it has limited our study on the reassessment effect of 700 audit standards on auditor's reports readability. On the other hand, the Fog index was used in this research to measure report readability. Thus, using different proxies (e.g. the text length index and the Flesch Reading Ease index) to calculate report readability can lead to different findings. Future studies can investigate these characteristics for longer durations to ensure their impact. It is further recommended that a similar study is extended to financial sector firms to understand the impact of auditor characteristics on the readability of audit reports.

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(The Appendix follows overleaf)

Appendix 1
Measuring the research variables

Variable	Symbol	Measurement	Source
Dependent variables			
Auditor's report readability	ART	Two indices are used; the first index is the readability of annexed notes, called the Fog index. The Fog index is a function of two variables of sentence length (based on words) and complicated words (defined as the number of three or multi-syllabus words). Fog index = (average no. of words in each sentence + percentage of complicated words) * 0.4 The second index for financial reporting readability is text length (IND LENGTH), which is calculated as follows Text length index = Ln number of text words	Lim *et al.* (2018), You and Zhang (2009), Ajina *et al.* (2015)
Independent variables			
Auditor narcissism	AuditNA	Since signature size correlates with narcissism, we can measure auditor narcissism in a naturally occurring setting	Church *et al.* (2020), Salehi *et al.*, (2022a)
Auditor confidence	AuditCON	The index of surplus investment in assets is used in this paper. It is calculated by dividing the residual of total asset growth regression (Assets.Gr_{it}) by sales growth (Sales. Gr_{it}). So that if the residual is greater than 0, this index is equal to one; otherwise to zero. This index is based on the fact that managers have more investment than their peers in firms whose assets grow at a higher rate than sales $Assets.Gr_{it} = a_0 + a_1 sales.Gr_{it} + \varepsilon_{it}$	Malmendier and Tate (2005a, b, 2008)
Audit firm size	AuditSIZE	Affiliated audit firms with official accounting associations are considered small auditing (small audit firms), so 0 will be assigned to them and the audit organization due to a large number of staff and longer history being considered large auditors and take 1	Arianpoor and Sahoor (2022)
Auditor change	AuditCHANGE	1 if the auditor has changed; otherwise, 0	Eshagniya and Salehi (2017), Salehi *et al.* (2022a)
Audit fee	AuditFEE	Audit fee which is obtained from the natural logarithm of the audit fee	Tarighi *et al.* (2022)
Auditor industry specialization	AuditIND	Auditor industry specialization is assessed using the market share approach since it is more applicable in Iran $MarketShare_{ik} = \frac{\sum_{j=1}^{J_{ik}} sales_{ijk}}{\sum_{k=1}^{J_k}\sum_{j=1}^{J_{ik}} sales_{ijk}}$ The numerator is the total sales of all clients of i audit firm in the k industry. The denominator is the total sales of all active firms in the k industry for all audit firms in that industry	Minutti-Meza (2013)
Auditor tenure	AuditTENURE	It is obtained from the number of years the auditor has worked as an independent auditor	Salehi *et al.* (2020), Salehi *et al.* (2022a)

(*continued*)

Variable	Symbol	Measurement	Source
Control variables			
Market value to book value of capital	MB	It is calculated by dividing the market value of equity by the book value	Salehi *et al.* (2022b)
Firm size	SIZE	Natural logarithm of firm assets	Arianpoor and Sahoor (2022), Salehi *et al.* (2022a)
Leverage	LEV	Total liabilities to total assets	Arianpoor and Sahoor (2022), Salehi *et al.* (2022a)
Return on assets	ROA	Net profit divided by total assets	Salehi *et al.* (2022a)
Firm's age	AGE	It is equal to the time interval between the firm establishment date and the year under study	Arianpoor and Sahoor (2022), Salehi *et al.* (2022a)
Sales growth of a firm	GROWTH	The percentage of net sales growth	Arianpoor and Sahoor (2022), Salehi *et al.* (2022a)
Dummy variables			
Year fixed effect	YEAR		
Industry fixed effect	INDUSTRY		

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