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Investigating the Impact of Digitalization of Clients and the Expertise of Auditing Firms in the Digital Field on Audit Quality: Evidence from IRAN

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Abstract

Objective: This study examines the relationship between the degree of digitalization of clients and the expertise of audit firms in the digital field on audit quality. It considers the role of auditors in this digital era.

Methodology: This research has been carried out using annual data of listed firms on the Tehran Stock Exchange from 2014 to 2022. Multivariate linear regression has been used based on panel data was used to test the research hypotheses.

Results: The results show that clients with high digitalization have high audit quality when they are audited. Also, expert auditors in the digital field provide a higher audit quality. In addition, the results of this research show that clients with high digitalization have high audit quality when audited by a firm with evolved and advanced information technology. The expertise of auditors in the digital field reduces the audit risk and increases the quality of the audit.

Innovation: The results of this study can be transformed by how external auditors can transform through digitalization and the use of newly developed digital tools. The development of new digital tools can also help the audit profession as one of the corporate governance mechanisms.

Keywords: Digitalization of clients, The expertise of auditing firms in the digital field, Audit quality.

1. Introduction

This study examines whether the degree of client digitalization affects audit quality. It also investigated whether the expertise of audit companies in the digital field affects audit quality. Since 2016, when Deloitte used artificial intelligence in the accounting industry, several researchers have indicated that information technology and digitization are essential in the audit market. During the 2019 coronavirus pandemic (COVID-19), many companies have adopted a digital strategy to increase the return on their assets (Singh et al, 2022). Therefore, auditors who audit a high-tech or digital company may face the challenge of adapting to technology such as blockchain-based distributed ledger (Rahman et al., 2023). Yang et al. (2020) found that audit firms with little digital expertise find it difficult to audit digitalized clients. With the increasing number of companies using new technologies and complex information systems to store data, auditors are required to adopt digital skills (Eulerich et al., 2023). Digitization helps auditors collect more valuable audit information (Eulerich et al., 2023). Their expertise in digital analysis is also an important issue. This research examines whether the digitalization of clients affects the quality of auditing. It also examines whether the expertise of audit firms in information technology affects audit quality. In recent years, digitization and artificial intelligence concepts have become very popular, and their applications in auditing have also attracted a lot of attention. This study examines the relationship between the degree of digitalization of clients and the expertise of audit firms in the digital field to assess audit quality and considers the role of auditors in this digital age. Manita et al. (2020) stated that the new stream of research shows the increasing attention to digitalization in organizations. The development of digital technology – massive data, AI and blockchain – creates many opportunities and challenges for accounting and auditing (Al-Htaybat and von Alberti-Alhtaybat, 2017; Tiberius and Hirth, 2019; Fähndrich, 2023). Ibrahim et al. (2021) emphasized the significant overlap between big data and accounting. Big data improves auditing and accounting tools that rely on data, such as performance measurement, audit evidence, and financial reporting. Meanwhile, many companies invest in blockchain as a technological innovation in the digital age (Han et al., 2023). Large auditing companies in advanced countries attach great importance to the development and implementation of blockchains (Han et al., 2023). Li et al. (2020) proposed blockchain-based public auditing, a new technique that can improve security and eliminate the "heavy computational and communication overhead" in cloud storage. Gao et al. (2020) say that more digital clients have more data available and ready. Audit firms with high digital expertise use big data analytics to assess the risk of material misstatement. Adapting from past literature, it is argued that the demand for audit quality can be driven by client motivations, determined by the client's ability to digitize, such as incorporating big data, blockchain, Artificial intelligence, and robotic process automation into business operations. These technologies are most common in the digital transformation of business that demands audit quality. It is also argued in this research that to survive in the competitive market; audit companies are introducing new technology into their processes and studying how to manage big data and new digital tools to add value to their clients. This digitization can improve audit quality and affect audit provision. For example, the digitization capabilities of clients and the pressure to provide higher audit quality are forcing audit firms to digitize their processes with relevant and reliable information. Since the impact of digitalization on auditing has been discussed in foreign studies, no evidence from Iran addresses this issue. Iranian research on auditing and digitalization mainly reviews the literature. It rarely does empirical analysis to examine the relationships between digitalization and audit quality, digitalization and digital skills, and auditors' digital skills and audit quality. In this study, examining the relationship between the company's use of digital technology, audit quality, and the demand for auditors with digital skills, the need for more research is answered, whether a digitalized company achieves

high audit quality or highly digitalized auditors needs? Furthermore, do auditors with digital skills provide better audit quality than their peers? Overall, this paper contributes to a dynamic understanding of the impact of digitalization of clients and audit firms' digital expertise on audit quality. This article is organized as follows:

Section 2 provides a theoretical background. Section 3 provides a literature review and discusses the hypotheses' development. Section 4 describes the methodology, sample selection and model. Section 5 presents the empirical analysis and results and finally, the discussion and conclusions are presented.

2. Theoretical framework

Digitization technologies

Advanced auditing technologies refer to new technologies such as big data analytics, robotic process automation, artificial intelligence, and blockchain (Kend and Nguyen, 2020; d. Huang and Vasarhely, 2019; Cao et al., 2015).

Big data technology

The use of big data technologies in auditing is still in its early stages. The impact of big data on the workplace has already been discussed in the audit literature. Unlike the current audit methods, which are mainly manual, the big data technique offers a unique approach (Yudowati and Alamsyah, 2018). Big data enables auditors to increase their efficiency. Combining big data and auditing is likely to eliminate audit time and environmental constraints, reduce audit costs, increase audit efficiency, improve audit targeting, and create a competitive advantage for the organization. The audit method became more comprehensive and appropriate in the context of the big data era (Gepp et al., 2018). Kend and Nguyen (2020) proved that big data analytics frees auditors from repetitive and time-consuming tasks, allowing them to focus their expertise and abilities on more important assessment tasks and key audit judgments.

External auditors can consider big data technology a critical tool to eliminate audit costs and improve profitability. Internal auditors can also consider big data technology because of its cost-effectiveness (Littley, 2012). The audit profession can use big data technology implicitly to improve business transactions with financial and non-financial data (Cao et al., 2015). Appelbaum and Nehmer (2017) pointed out some challenges of auditors regarding big data technology, which include the lack of experience working with unfamiliar data sources and the problems of evaluating data suitability, reliability and objectivity (Appelbaum and Nehmer, 2017). Also, how to establish a logical connection between non-structural and non-financial data and structural and financial data is not clear (Yoon et al., 2015).

Blockchain

Blockchain is primarily a fully decentralized database that stores information chronologically (White, 2017). A blockchain system could potentially reduce the number of auditors by having intermediaries verify the accuracy of financial reports. Users who adopt blockchain technology can trust transactions stored in a public blockchain system that is decentralized and validated. However, for audit purposes, auditors still need to verify transactions in a private blockchain system (Strüker et al., 2019). Overall, a blockchain system's risks and potential benefits for auditing purposes have not yet been fully explored (Dai and Vasarhelyi, 2017).

Artificial intelligence

Artificial intelligence has been the most promising but threatening invention of recent years (Clifford, 2019). As a subcategory of machine intelligence, artificial intelligence is considered the intelligence revealed by machines compared to human and animal intelligence (Haenlein and Kaplan, 2019). Artificial intelligence is involved in various activities related to human information processing, including planning, learning, and pattern recognition (Minsky, 1961). More importantly, artificial intelligence is used in language recognition, visual pattern recognition or logical problem solving (Gershman et al., 2015). Jordan and

Mitchell (2015) investigated the effects of artificial intelligence in auditing and found that top auditing firms use artificial intelligence to collect and validate data. Therefore, AI can detect anomalies in accounting data for auditing purposes. Gershman et al. (2015) mentioned several effects of artificial intelligence in auditing. For example, artificial intelligence can easily and automatically review financial data, identify fraud in accounting and interpret financial and non-financial data, enabling auditors to optimize their resources.

Robotic Process Automation

Robotic process automation, or RPA, refers to using robotic systems to automate an organization or business. In other words, robotic automation is a type of technology that provides these conditions for computer software to simulate and integrate human performance when using a digital system. Robotic automation of processes has been widely used in finance and accounting, especially in auditing. (Moffitt et al, 2018). According to Aguirre and Rodriguez (2017), recent studies report the benefits of robotic process automation in terms of productivity, cost, speed, and error reduction. Moffitt et al. (2018) claimed that robotic automation of processes can be used to advance audit automation. Aguirre and Rodriguez (2017),proposed a framework for using robotic automation of processes for auditing and emphasized that structured, rule-based, and repetitive auditing activities can be automated. Huang and Vasarhelyi (2019) applied robotic process automation to the audit context and proposed a framework that prevents auditors from performing repetitive audit tasks. Due to the high efficiency and low error tolerance of the robotic automation of processes for processing accounting information, the reliability of audit information is guaranteed, thereby improving the quality of the audit and guiding management in its decisions. With the popularity of automation and digital technology, robotic process automation as a business process automation tool or platform based on software robots and artificial intelligence - It is widely installed as software on personal computers, servers in large accounting firms to assist or replace auditors. Robotic automation of processes in various repetitive operations can help auditors perform many audit tasks faster, better and safer. Therefore, robotic automation of processes helps accounting firms to significantly improve the quality and efficiency of their audits. Robotic automation of processes replaces manual work and reduces the cost of highly repetitive tasks and processing time. According to Aguirre and Rodriguez (2017), the cost of setting up a robotic process automation software is about one-ninth of the cost of hiring an employee. The probability of error of robotic automation of processes in auditing is less than that of accountants (Moffitt et al, 2018). Finally, robotic automation of processes offers a flexible workflow Aguirre and Rodriguez (2017).

Audit quality

One of the important factors determining the demand for auditing quality is the ability of the client. DeFond and Zhang (2014) defined client empowerment as her (his) ability to satisfy the need for audit quality that originates from her motivation. Past literature on customer empowerment has been based on corporate governance and audit quality. For example, stronger corporate governance helps the firm to increase audit quality by hiring industry expert auditors, selecting auditors from top firms, and paying higher audit fees. give (Beasley and Petroni, 2001; Cassell et al , 2012; Beasley and Salterio, 2001). External audit is one of the important mechanisms of corporate governance in modern organizations (BenYoussef and Drira, 2020). Specific corporate governance mechanisms such as audit committee characteristics, internal control reporting, and internal audit functions can help clients achieve a desired level of audit quality (DeFond & Zhang, 2014). Recent research on customer capabilities focuses on a new corporate governance mechanism called "customer digitization rate"; Something that helps clients achieve the desired level of audit quality. For example, Gao et al. (2020) stated that data analytics can improve audit quality among more digital clients. Multi-industry companies (such as

technology) are more digital in attracting customers, creating new products, and facilitating operations (Fotoh and Lorentzon, 2021). Gao et al. (2020) found that human capital investment in data mining and digitized clients improved audit quality using data they collected manually on US audit firm employees' skills in data mining. Shahzad et al. (2019) found out the effect of financial reporting quality and audit quality on the investment efficiency of companies listed on the Pakistan Stock Exchange; That is, the high quality of financial reporting and the high quality of auditing are related to the high efficiency of investment. Maghakyan et al. (2020) using data from the US and Europe (Finland) found that audit firms with highly digitized clients receive higher audit fees than firms that do not have this expertise. Therefore, in this study, it is predicted that customer capability (especially the level of digitalization of customers) can meet their need for audit quality. Various factors can affect auditors' motivation to provide audit quality. Watts and Zimmerman (1981) stated that the supply of audit quality is a function of the auditor's motivation in terms of independence and competence. Many previous studies on auditors' capabilities mainly focus on auditors' industry expertise, firm size, and audit process characteristics (DeFond and Zhang, 2014). A new direction in the growing literature on auditor capabilities and their impact on audit quality is the digitalization of audit firms. The performance of financial artificial intelligence in auditing is attracting increasing attention. Manita et al. (2020) conducted qualitative research on the digital transformation of external auditing by interviewing auditors of the top five auditing firms in France. The findings showed that digital technology can also work on all client data to improve audit quality. The impact of artificial intelligence on companies has also been investigated. Haenlein and Kaplan (2019) reported that artificial intelligence can have internal and external effects; Internally, AI can efficiently complete high-quality audits, and externally, the adoption of AI can impact the relationship between audit firms and their clients.

3. Literature Review

Previous studies show that the critical task of auditing is to determine the reliability and security of audited accounts or reports (Boylan et al, 2018). According to Flint (1988), the main purpose of auditing is to determine whether specific tasks are being performed effectively, honestly, and correctly in compliance with fundamental rules and regulations. Cleartex (2019) defined auditing more precisely and presented the view that an auditor is a person who is supposed to check the books of accounts of the company and the validity and correctness of the transactions made. Cleartex (2019) also added that the auditor should arrive at an opinion about the overall outlook of the financial statements of the employer by considering a "true and fair view" of the financial position of the employer. Wallerstedt et al. (2006) pointed out that auditing is necessary in society; Therefore, those involved in this profession must continuously address criticisms and participate in discussions. Finally, Flint (1988) concluded by stating that an audit is a special type of review that is part of accountability assurance that is conducted by a third party who objectively compares performance to expectations and reports the result. Mankind has made continuous advances in technology (Granlund, 2007), which in recent decades has led to the globalization of societies and markets. Breman and Felländer (2014) pointed to continuous economic changes and described one of these structural changes as digitalization. Information technology and digitization are the reality of today's society. Information technology affects our daily life in different waysdifferently (Ghasemi et al., 2011). But these cases were initially ignored (Spraakman et al., 2015). Previous research has identified the vital relationship between digitization and auditing due to the paradigm shift towards a digital society where information technology is increasing daily. (Berman and Fllander, 2014; Han et al, 2016). Most research published in the last 20 years concerns audit quality (DeFond and Zhang, 2014). DeAngelo (1981) defines audit quality as: "The extent to which a given auditor both detects and reports a violation of the client's

financial statements." Therefore, according to DeAngelo's (1981) definition, audit quality is a function of the auditor's ability to detect misstatements in data and report errors. Here, the discovery of distortion in the data can be called the technical capabilities of the auditors, and the error report can be considered as their independence. Palmerose's (1988) definition of audit quality in terms of assurance level is considered the real audit quality in the relevant literature (DeFond and Zhang, 2014). According to Palmrose (1988), considering that the main purpose of the audit is to provide a certificate of assurance of the client's financial statements, the quality of the audit is the probability that there is no distortion in the data in the financial statements. The above definition mainly uses audit results that have the reliability of financial statements, which ultimately reflects the quality of the audit. According to Simunik (1980), auditors provide assurance services that are an economic product. DeFond and Zhang (2014) argued that audit quality is determined by both client demand and audit supply, which depend on client and auditor motivations and capabilities, respectively. This study argues that the demand for audit quality can be driven by client motivations determined by client capabilities in digitalization, such as bringing big data, blockchain, artificial intelligence, and robotic automation of processes into business operations. These technologies are most common in the digital transformation of businesses that demand audit quality. For example, Gao et al. (2020) argued that data sourcing helps improve audit quality among increasingly digitalized clients. This research argues that the supply of audit quality can be affected by the digitization of audit firms. For example, the digitalization capabilities of clients and the pressure to provide higher audit quality can force audit firms to digitize the audit process with reliable and relevant information. Porter and Heppelmann (2014) pointed out that competition and increased client pressure to provide reliable and relevant information are the main factors forcing audit firms to digitize their services. Due to new technologies, digitalization is progressing (Tiberius and Hirth, 2019) and will probably continue progressing (Verhoef et al., 2021). Parviainen et al. (2017) introduced digitization as beneficial for businesses, communities and governments. According to Verhoef et al. (2021), a company's digitalization can show the extent of its use of computers and digital technologies. Companies that use digital technology can gain more advantages by converting existing services or products into digital items (Parviainen et al., 2017). Using digital technologies, companies want to change their business model in such a way as to gain more value (Björkdahl, 2020). By turning their work into software and digitizing their manual tasks and operations, companies can better understand cost drivers, risk causes, and process performance (Parviainen et al., 2017). In the review of research in the fields of accounting and auditing, it is found that more and more research deals with the relationship of accounting and auditing with digitalization. Also, the concepts of digital audit (Rahmatullin and Guzelbaeva, 2019) and digital transformation in these professions (Pizzi et al., 2021) have attracted much attention.Big data is one of the important components of digitization (Tiberius and Hirth, 2019). Decision-making is expected to become easier because big data can improve information provision, accuracy and correctness of data analysis, and diversity of data sources (Fähndrich, 2023). New technology implemented in work operations such as enterprise resource planning, improves data provision and flexibility of information provision in the enterprise (Manita et al., 2020). Ibrahim et al. (2021) pointed out that big data can help auditors obtain appropriate and sufficient audit evidence that is more consistent with auditing standards and improves the overall level of assurance. Depending on the digital technology used, accountants and auditors can obtain a large amount of processed data in real time (Ibrahim et al., 2021). Pizzi et al. (2021) investigated how digital transformation affects internal auditing and found that organizations are gradually paying attention to the risks and opportunities associated with investing in or using new technologies. Pizzi et al. (2021) acknowledged that the

current internal audit framework is not flexible enough to accept and adopt digitization. Al-Htaybat and von Alberti-Alhtaybat (2017) pointed out inherent contradictions between a company's digital transformation and corporate reporting. For example, the main condition of corporate reporting is accuracy, and presenting the report with past information can be more reliable (Fähndrich, 2017). But when big data technology is used, timely information is less reliable, a phenomenon referred to as the paradox of reliability versus timeliness (Fähndrich, 2017). Al-Htaybat and von Alberti-Alhtaybat (2017) also describe the paradox of ease and complexity of corporate reporting. Big data improves the provision of data and information to facilitate decision-making (Al-Htaybat and von Alberti-Alhtaybat, 2017). In contrast, Al-Htaybat and von Alberti-Alhtaybat (2017) were concerned that digital technology could increase the complexity of corporate reporting, as participants may not have relevant data analysis and IT skills. This study argues that the demand for audit quality can be driven by client motivations determined by client capabilities in digitization, such as bringing big data, blockchain, artificial intelligence, and robotic process automation into business operations. These technologies are most common in the digital transformation of businesses that demand audit quality. For example, Gao et al. (2020) argued that data sourcing helps improve audit quality among digital clients. Considering the findings of Gao et al. (2020), we expect audit quality to improve among more digital clients. In addition, based on the results of Fotoh and Lorentzon (2021), it is argued that companies with more technology are more digital in attracting clients, creating new products, and facilitating operations. It is also argued that more digital clients have more readily available data that auditors can use to mitigate the risks of data distortion. Therefore, audit quality is expected to be more prominent in clients of more digital industries. Based on the above arguments, the following hypothesis is proposed: according to Kend and Nguyen (2020), digital technologies, such as big data analysis, artificial intelligence, and robotics, generally have a positive impact on auditing. Unlike manual tasks, digital audits do not require much time and can be spread over more important tasks. Manita et al. (2020) conducted qualitative research through interviews with auditors of the top five auditing firms in France to study the digital transformation of external auditing, and they showed that digital technology can also work on client data and improve audit quality. Digital technology enables auditors to analyze various processes and client data more and identify discrepancies and errors in financial reports. Lois et al. (2020) surveyed 105 people from the largest audit firm in Greece and proved that technological advancement is important in creating an efficient digital audit system. Reviewing past literature can show the controversial effect of digital technology or digitization in auditing. In examining auditing in the digital age, the risks that digitization creates for auditing have always been important. The importance of auditors' technology, computer science or data analysis skills is well recognized (Lois et al., 2020; Pizzi et al., 2021). Maghakyan (2020) analyzed firm-level data from the US and Finland and found that audit partners with expertise in digitization command higher audit fees than their peers. Gao et al. (2020) conducted an empirical analysis of US data to investigate the effect of data sourcing on audit quality. This ultimately found that audit quality improved with auditors' ability to analyze data. Moreover, this effect was more significant in more digital clients and those with accounting estimates and complex business activities (Gao et al., 2020). Maghakyan (2020) and Gao et al. (2020) did a lot of work on the relationship between auditors' skills in data analysis, audit quality and the degree of digitization of audit clients. This study argues that audit firms are now incorporating new technology into their audit process to stay competitive and analyze how to handle big data and new digital tools to add value to clients. This digitization can improve audit quality. For example, the auditor can evaluate all the data of his client companies using digital tools such as big data mining and no longer

needs to use the audit sampling method (Manita et al., 2020). In addition, an audit firm with a high degree of digitization can help the auditor assess business risk and judgment quality by identifying all anomalies and providing solutions for critical issues (Manita et al., 2020). Finally, it is argued that the supply of audit quality can be affected by the digitalization of audit firms. For example, the ability to digitize clients and the pressure to provide higher quality can force companies to digitize their audit process with relevant and reliable information. Porter and Heppelmann (2014) pointed out that competition and increased pressure from clients to provide reliable and relevant information are among the main factors that force audit companies to digitize audit services. Based on the above arguments, the following hypothesis is proposed:

3.1. Research hypotheses

According to the theoretical foundations presented in the theoretical framework and research background, the research hypotheses are as follows:

Hypothesis 1. Clients' digitalization is significant and positively related to audit quality.

Hypothesis 2. Auditors' digital expertise is significant and positively related to audit quality.

Hypothesis 3. Auditors' digital expertise moderates the relationship between clients' digitization and audit quality.

4. Methodology

4.1. Statistical population and samples

The collection and inductively analysis of quantitative data longitudinally and retrospectively performed this correlational research. The statistical population includes all companies listed on the Tehran Stock Exchange from 2014 to 2022 whose shares are listed on the stock exchange. To collect and analyze the data required for the research, we used the information site of the capital market publishers and Rahavard Novin's software. A systematic removal method was used to select the samples; applying the following conditions, 152 companies were considered as the statistical sample:

1) All data required for the research should be available for the companies under survey;
2) The financial year of the company should end on March
3) The financial year should not change in the time frame of the research; 4) It should not belong to investment companies, financial intermediaries, banks, and leasing companies.

4.2. Research Model and Variables

Model of the first research hypothesis

Model (1)

$AQ= a_0 +a_1Digi\_ Cli +a_2Tenure + a_3 Change + a_4 InvRec + a_5 LEV + a_6 ROA + a_7 LnSize + a_8 CFO + \varepsilon$

Model of the second research hypothesis

Model (2)

$AQ = a_0 + a_1 Digi\_Aud +a_2Tenure + a_3 Change + a_4 InvRec + a_5 LEV + a_6 ROA + a_7 LnSize + a_8 CFO + \varepsilon$

Model of the third research hypothesis

Model (3)

$AQ= a_0 + a_1 Digi\_ Cli + a_2 Digi\_Aud +a_3Digi\_ Cli *Digi\_Aud + a_4Tenure + a_5 Change + a_6 InvRec + a7 LEV + a8ROA + a9 LnSize + a10 CFO + \varepsilon$

Table 1. The Definitions of the Variables

Meaning	*Category*	*Name*	*Symbol*
The natural logarithm of audit fees paid by the client	Dependent	audit quality	AQ
Indicators indicated by the frequency of keywords in the reports reflect the digitization of the listed companies. In this research, "artificial intelligence technology", "blockchain", "cloud computing", "big data technology" and "digital technology" are used as digitalization indicators. Digi_Cli is represented by the frequency of keywords that appear in a company's annual reports.	Independent	digitalization of Clients	Digi_Cli
Ratio of audit fees of digitalization industries (audit fees of digital companies / total industry audit fees)	Moderator And Independent	expertise of auditing firms in the digital field	Digi_Aud
The number of consecutive years that the auditor has been responsible for the company	Control	Auditor tenure	Tenure
It is a dummy variable equal to one if the company has changed its auditor during the financial year and zero otherwise.	control	Audit change	Change
The sum of inventories and receivables divided by total assets	control	Inventory and receivables	InvRec
Asset-to-debt ratio (Total Debt / Total Asset)	control	Financial Leverage	LEV
Net profit divided by total assets	control	return on assets	ROA
The natural logarithm of the market value of equity	control	company size	Size
Net cash flow from operations divided by total assets	control	company's operating cash flow	CFO

5. Research Findings

5.1. Descriptive statist

Table 2 presents descriptive statistics for the primary variables used in the analyses. These indicators mainly include information about central indicators such as mean median and dispersion indicators such as standard deviation. The most important central indicator is the average, which is a good indicator to show the centrality of data. For example, the digitalization of the Clients Index has an average value of 0.66, indicating that most data are focused around this point. In general, the dispersion parameters are the criteria for determining the dispersion of each other or their dispersion relative to the mean. One of the most essential dispersion parameters is the standard deviation. The value of this parameter for the financial lever variable is (0.211).

Table 2. The descriptive statistics of the observed research variables

Max	*Min*	*Sd*	*Mean*	*variables*
074/4	477/2	4/0	24/3	AQ
2	0	62/0	66/0	Digi_Cli
150/0	002/0	049/0	061/0	Digi_Aud
6	1	34/1	24/2	Auditor tenure
1	0	048/0	002/0	Audit change
751/0	007/0	167/0	268/0	Invrec
920/0	051/0	211/0	423/0	Lev
217/0	239/0-	063/0	043/0	ROA
190/4	690/9	67/0	710/6	Ln Size
237/0	166/0-	069/0	045/0	CFO

5.2. The results of the first research hypothesis:

Table 3 shows less than 5%, so we conclude that the model is generally statistically acceptable, and the Fisher statistic's high value indicates a strong relationship between variables in this model. As the coefficient of determination and the adjusted coefficient of determination indicate, it confirms the high power of the model explanation. From the value provided by the Watson-Durbin statistics, which can be confirmed by the lack of correlation in the model, there is no need to review this statistic due to the short period. Now, considering the significant confirmation of the whole fitted model, the meaningful analysis of each explanatory variable is discussed. As shown in the table below, for each coefficient variable, t statistic, and finally, the value of p is given. For meaning, each of the variables in the model is referenced to the p column or the same level of significance. Now, concerning the value of p, if the arbitrary error α is compared with the values of p, one can consider the meaning of each of the variables. Also, considering that the variance inflation factor (VIF) value for all research variables is less than five, the model has no collinearity problem. Table 3 presents the regression results of the first model. The results show a positive and significant coefficient with audit quality, indicating that highly digitalized clients have higher audit quality when audited. This result shows that a company with a high level of digitalization has a better operating system than other companies; therefore, its audit risk is lower. Therefore, the first hypothesis of the research is confirmed.

Table 3: Estimation of the coefficients of the model.1

$AQ= a_0 +a_1Digi\_ Cli +a_2Tenure + a_3 Change + a_4 InvRec + a_5 LEV + a_6 ROA + a_7 LnSize + a_8 CFO + \varepsilon$				
VIF	**Probability**	**t-statics**	**Coefficient**	**Variables**
١,٣٣١١٧١	٠,٠٠٠٠	٢٤,٤٤٢١٨	٢,٠٢٦٨٩٩	Digi_ Cli
١,٠٩٢٦٦٠	٠,٠٤٧٤	-١,٩٨٤١٠٨	-٢,٢٠٩٠٠١	Auditor tenure
١,٢٢٩٥٥٥	٠,٠٠٠٠	-١٠,٨٦٩٣١	-١٣,٦٥٢٢٩	Audit change
١,٢٠٣٩٦٧	٠,٠٤٨٧	١,٩٧٢٧٨٨	١٠,٧٥٧٦٢	Invrec
١,٢٠٤٩٤٤	٠,٠٠٠٠	-١١,٨٣٦٥٠	-١٧,٥٩٢٩٨٣	Lev
٤,٩١٩٨٦٥	٠,٠٠٠٠	٥,٦٦٩٣٤٢	٠,١٩٨٤١٧	ROA
٤,٢٠١٠٣٥	٠,٠٠٠٠	٥,٤٠١٦٨٥	٠,١٨٧٠٥٧	Ln Size
١,٢٢٤٦٦٣	٠,٠١٧٦	٢,٣٨٠٢٥٩	٠,٠٤٠٦٢٤	CFO
-	٠,٠٠٠٤	-٣,٥٨٤٢١٣	-١٥,٦٣٤٥٦	C
٠,٦٣٩٤٣٢		R-squared		
٠,٦٣٦٤٨٨		Adjusted R-squared		
٢١٧,١٦١٢		F-statistic		
٠,٠٠٠٠		F-probability level		
١,٦٩٦١٦٧		Durbin-Watson		

5.3. The results of the second hypothesis:

The results in Table 4 show a positive and significant coefficient of Digi_Aud with audit quality, which shows that if the information technology of the audit company evolves and develops under the same conditions, its audit quality is higher. The second hypothesis is confirmed because auditors who specialize in digital provide higher audit quality. In models 1 and 2, if the auditor company has changed during the financial year, the audit quality will decrease, which indicates a significant negative relationship between the audit firm's tenure and the quality of the client's audit. The results show a positive and significant relationship between company size and audit quality.

Table 4: Estimation of the coefficients of the model 2

AQ(LnAF) = a0 + a1 Digi_Aud +a2Tenure + a3 Change + a4 InvRec + a5 LEV + a6 ROA + a7 LnSize + a8 CFO + ε				
VIF	**Probability**	**t-statics**	**Coefficient**	**Variables**
١,٤٧٨٠٠٤	٠,٠٠٠٠	٤,٠٨٩٩٠٢	٣,٧٣٣٣٧٥	Digi_Aud
٢,٣٦٨٨٨١	٠,٠٠٠٠	-٧,٣٧٩٠٩٧	-٩,١٨٢١٤٨	Auditor tenure
١,٠١٦٦٧٥	٠,٠٢٣٣	-٢,٢٧١٥٣٧	-٠,١٩٦٧٥١	Audit change
١,٠٦٠٠١٥	٠,١٦٣٦	١,٣٩٣٩٦٥	٠,٢٠٣٩٢٩	Invrec
١,٥٦٢٦٦٦	٠,٠٠٠٠	٤,١١٣٧٠٦	٢,٨٢٩٥٤٨	Lev
١,٠١١٣٧٢	٠,٣١٦٤	١,٠٠٢٢٠٢	٠,٠٠٤٦٧٧	ROA
١,٥٨٨٢٠٠	٠,٠١١٥	٢,٥٣٠٠٨٢	٢,٢٣٩٩٨٣	Ln Size
١,٠٤٣٧٨٥	٠,٠١٥١	٢,٤٣٢٦٢٠	٠,١٦١٧٦٧	CFO
-	٠,٠٠٠٠	٤,٤٥٧٩٧٥	٥٢,١٣٠٩٤	C
٠,٥٦٣٣٩٧		R-squared		
٠,٥٥٧١٨٣		Adjusted R-squared		
٩٠,٦٦٨٢٦		F-statistic		
٠,٠٠٠		F-probability level		
٢,١٩٣٨٢٥		Durbin-Watson		

5.4. The results of the third hypothesis:

Table 5 presents the moderating effect of auditors' digital expertise on the relationship between clients' digitalization and audit quality. The regression results show a positive and significant coefficient (Digi_ Cli *Digi_Aud) with audit quality. Highly digitized clients have high audit quality when audited by an audit firm with evolved and advanced information technology. This result shows that auditors' expertise in information technology reduces audit risk and increases their audit quality.

Table 5: Estimation of the coefficients of the model.3

AQ= a_0 + a_1 Digi_ Cli + a_2 Digi_Aud +a_3Digi_ Cli *Digi_Aud + a_4Tenure + a_5 Change + a_6 InvRec + a7 LEV + a8ROA + a9 LnSize + a10 CFO + ε				
VIF	**Probability**	**t-statics**	**Coefficient**	**Variables**
١,٠٩٥٥٥٧	٠,٠٠٠٢	٣,٧٦٠٦٩٣	٤٧,٣٢٣٢٥	Digi_ Cli
١,١٥٩١٣٤	٠,٠١٠٠	٢,٥٨٦٢٩٤	٨,١٠٤١٠٩	Digi_Aud
١,٠٢٨٩٨٦	٠,٠٢٨٩	٢,١٩٢٠٨١	٢,٥٢٨٤٧٠	Digi_ Cli *Digi_Aud
١,٠٤٣٥٢٦	٠,٠٠٦٩	-٢,٧١٦١١٧	-٤,٣٨٧٩٠٣	Auditor tenure
٣,٢٥٥٧٤٧	٠,٠٠٠٠	-٧,١٦٥٩٦١	-٦,٦٦٤٤٦٤	Audit change
١,١٠٧٥١٧	٠,٠٨٤٩	١,٧٢٧١٦٠	١,٤٧٩٨١٥	Invrec
١,١٤٦٦١٤	٠,٠٤٨٠	١,٩٧٩٧٤٨	٠,٣٦٥٧٣٠	Lev
١,٢٨٦٤٢٠	٠,٠٠٧٤	-٢,٦٨٩٦٧٠	-٢,٩٨٦٥٢٤	ROA
١,٢٥٥٣٥٣	٠,٠٢١٢	٢,٣١٣٨٠٠	٣,٥١٨٦٢٣	Ln Size
١,٠٢٤٩٩٦	٠,٠٠٨٩	-٢,٦١٥٣٥٦	-٠,٠١١٢٧٧	CFO
-	٠,٠٠٦١	٢,٨٨٢٢٤٢	٠,٦١٣٧٦١	C
٠,٤٤٥٩٣٤		R-squared		
٠,٣٠٧٤١٧		Adjusted R-squared		
٣,٢١٩٣٥٣		F-statistic		

$AQ= a_0 + a_1$ Digi_ Cli + a_2 Digi_Aud +a_3Digi_ Cli *Digi_Aud + a_4Tenure + a_5 Change + a_6 InvRec + a7 LEV + a8ROA + a9 LnSize + a10 CFO + ε				
VIF	**Probability**	**t-statics**	**Coefficient**	**Variables**
۰,۰۰۲۷۶۳		F-probability level		
۲,۱۶۱۲۶۵		Durbin-Watson		

6. Discussion and Conclusions

This study investigated the effect of the client's level of digitalization and the auditor company's expertise in the digital field on audit quality. The results show that a company with a high level of digitalization has a better operating system and, as a result, has a low audit risk. This result shows that clients with a high level of digitalization have more ready and easily accessible information. These findings are consistent with previous literature findings. Gao et al. (2020) found that human capital investment in big data improves audit quality. Using data from the United States and Europe (Finland), Maghakyan et al. (2020) find that audit firms specializing in digital receive higher audit fees from clients with a high level of digitalization than non-expert auditors. Haenlein and Kaplan (2019) also reported that artificial intelligence has internal and external effects. Internally, AI efficiently completes quality audits. Externally, adopting artificial intelligence affects the relationship between audit firms and their clients. The findings of this research also play a role in the supply theory of audit quality, which says the supply of audit quality can be affected by the digitalization of audit firms. For example, clients' ability to digitize and the pressure to provide higher quality can force firms to digitize their audits with reliable and relevant information. These findings are consistent with the findings of Porter and Heppelmann (2014). These people pointed out that competition and increased pressure from clients to provide reliable and relevant information are the main factors that lead audit companies to digitize audit services. Finally, these findings improve the audit quality and corporate governance literature by clarifying how external audits are evolving through digitization and the inclusion of newly developed digital tools such as big data, data analytics, artificial intelligence, and robotic automation of processes. Our research findings provide valuable practical applications for management and audit professionals to better understand the evolution of digital transformation strategies and audit methodology. This study may also help audit professionals in other ways. For example, importing digital tools can automatically monitor financial transactions and detect fraud. Digital tools such as artificial intelligence can interpret different data sources, enabling auditors to optimize their resources and use their expertise to evaluate documents on a larger scale and in greater depth. These findings provide important information to policymakers and legislators. For example, our study can help legislators and audit policymakers to identify and implement necessary reforms in auditing standards. In addition, our findings help university business schools modify their academic curriculum by introducing new training programs for students to meet the unique needs of audit firms in the digital age. Finally, the findings of this research provide critical information for auditors So that they can complement their professional knowledge and audit practices by developing a new way of thinking, analyzing information or acquiring IT skills such as big data, artificial intelligence and robotic automation of processes. The strength of auditors with specialized digital skills is that they can understand the audit tasks of companies with high digital transformation and perform them correctly. Through empirical tests, this study contributes to the existing literature on audit quality and the future of auditors in the digital age and suggests directions for future research. These findings can add to the audit quality and corporate governance literature by clarifying how external audits are evolving through digitization and the introduction of newly developed digital tools such as big data,

artificial intelligence, and robotic automation of processes. In this study, only one method of measuring audit quality was used. Audit fees alone may not provide a sufficient explanation for the choice of audit quality in all markets. Therefore, future research is recommended to consider other indicators to measure audit quality, for example, the size of the auditor or the quality of financial reporting (which is determined by accruals, accrual quality improvement, and conservatism). Also, this study used keywords related to digitization to measure a company's digital level. Future studies can use more quantitative measures to show this variable.

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