Research and Analysis of the Impact of Company Digitalization on Auditing

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Abstract. In the era of big data, digitalization has become an important requirement for companies to improve their competitiveness and promote high-quality development. Through a review of professional literature in the field of digitalization within five years, this paper analyzes the impact of digitalization of companies on corporate auditing, and finds that digitalization of companies leads to lower or higher audit fees, generally leads to lower or higher audit risks of companies, and improves corporate audit quality, while increasing the amount of audit evidence. These effects are generally more pronounced in non-state companies and non-Big 4 firms, reflecting the profound impact of digitalization on private companies. The study further explores the impact of digitalization on auditing, and explores the changes brought by digitalization to auditing from a holistic perspective, providing a further theoretical basis for digitalization and improving the auditing system of companies.

Keywords: Digitalization; Blockchain; Audit Fees; Audit Risk; Audit Quality; Audit Evidence.

1. Background of the Study

The advent of the information age has advanced the pace of digitalization, and the state has attached increasing importance to the digitalization of auditing.In October 2014, the State Council mentioned in the "Opinions on Strengthening Audit Work" to accelerate the promotion of audit informatization and explore ways to use big data technology in audit practice.In June 2021, the Audit Office issued the "14th Five-Year national audit work development plan", which mentions the need to adhere to the strong audit of science and technology, the full use of modern information technology to improve the quality and efficiency of the audit. This shows that the state maintains a high level of attention to the digitalization of auditing, while reflecting that technology-enhanced auditing is a necessary path for China's auditing in the digital information era, as well as a topic that promotes the transformation of the traditional business operation mechanism of auditing. Savastano et al point out that the Internet and digital technologies fuel the digitalization of the manufacturing industry and revolutionize the strategic capabilities and business processes [1], and Rogere argues that the process of digitalization is essentially a process of transforming strategic thinking despite the upgrade of IT infrastructure [2]. Domestic and foreign scholars have their own understanding of the study of digitalization, but they all agree that digitalization has an important significance for the development of companies and society. With the increasing emphasis on digital engineering projects in China, the digitalization of auditing has continued to flourish.

In the process of digitalization, companies need to pay attention to the audit information issues brought by digitalization, give full play to the role of digitalization in the process of integration, delivery and disclosure of audit information, improve the efficiency of accounting and audit information delivery while promoting the standardization of accounting information disclosure, thus reducing the cost of information used by stakeholders and better reflecting the actual situation of companies [3]. The impact of digitalization is more limited for the "Big 4" firms, which have a stronger moderating role in auditing and a stronger incentive to avoid audit failures [4], while international Big 4 audits can play a governance role. mitigating the negative effects of controlling shareholder equity pledges [5].

Audit digitalization is imperative, but there are many problems and challenges in the digitalization of company audit, such as the dramatic increase in data volume, complex system relationships, and the reduction of paper-based information [6], etc. The challenges in these directions will increase the

cost burden of companies in the process of audit digitalization, including increased costs in data management, personnel training management, etc., and weaken the enthusiasm of companies in the process of audit digitalization. At the same time, the state has not taken mandatory requirements for company audit digitization, and companies still have the discretion to choose whether to promote the digitalization of audit in depth, which makes company audit digitization compromised to a certain extent. All these restrict the digitalization of company audit in China to develop in the direction of deep and high quality. This shows that audit digitalization still has a long development space and research value.

Based on this, this study aims to conduct a review and analysis of the literature on digitalization of auditing, to identify the multiple impacts of digitalization on auditing, and then to propose reasonable and effective opinion measures on the many problems faced by digital auditing.

2. Current Status of Research

2.1 Three Aspects of Company Digitalization Research

After summarizing the main research directions of digitalization of companies at this stage, it is found that the existing literature mainly discusses and researches in three aspects: meaning, influencing factors and transformation results.

In terms of conceptual meaning, digitalization is a dynamic evolutionary process in which companies achieve changes in their production and operation methods and development models with the innovation and application of digital information technology [7], while digitalization also refers to the innovation process of companies using digital technology to adapt to a highly changing digital environment by reshaping their vision, strategy, organizational structure, processes, capabilities and culture [8]; Zeng Delin et al [9] define digitalization as follows: digitalization is the starting point of supporting infrastructure of digital technology, digital products and digital platforms, which in turn triggers changes at multiple levels of individuals, organizations and industries;

In terms of influencing factors, Yao Xiaotao et al [10] found that the key factors of company digitalization can be divided into three levels: individual (team), organization and industry; Zhang Xiaheng [11] found that technological innovation, transformation thinking, digital technology application, vulnerability of SMEs and their own differences constrained the digitalization of SMEs during the study of SMEs digitalization; Yang Rongmei et al [12] in the case concluded in the process of analysis that the main factors affecting the digitalization of internal auditing in companies are macro-environmental changes, changes in the intrinsic needs of auditing, changes in organizational forms and business practices, and high-level promotion;

In terms of transformation results, Xu Chenyang et al [13] find that digitalization can help companies reduce transaction costs, improve input productivity, and stimulate innovation; meanwhile, Chen Jian et al [14] show that successful transformation of company digitalization is conducive to optimizing company operation system and improving company operation efficiency; Chen Qingjiang et al [15] analyze that digitalization of companies receives significant cohort effect; Liu Mengsha et al [16] articulate that digitalization of companies will significantly reduce the cost of debt financing, and the degree of digitalization of companies is inversely proportional to the cost of debt financing; meanwhile, affirming Hao et al [17] argue that digitalization will penetrate into many aspects of company operation and management, realize the optimization and change of company development mode, and at the same time improve the willingness and ability of companies to fulfill social responsibility;

2.2 Breakdown of Digitalization

2.2.1 Blockchain

Blockchain is a new behavior model based on big data, Internet, blockchain technology, hash algorithm, and contract transactions [18], and because blockchain is a distributed bookkeeping built

on computer code, all transactions occurring on it will be recorded truthfully [19], and at the same time, blockchain has core features such as decentralization of system, transparency of transaction mechanism, and non-tamperability of data, which can effectively improve the integrity and reliability of audit evidence. At the same time, blockchain has the core features of decentralized system, transparent transaction mechanism and untamperable data [20], which can effectively improve the integrity and reliability of audit evidence, and address the current audit management problems of "emphasis on site, light on file", "emphasis on substance, light on form", "emphasis on practice, light on procedure", "emphasis on efficiency, light on procedure", and "emphasis on efficiency, light on procedure. [21] "Blockchain will be able to provide a certain degree of solution to this situation, while the companies under the background of "separation of powers" can better play the role of CPA through blockchain. This makes blockchain technology inherently coupled with the audit relationship and the requirements of audit behavior [22], so blockchain technology will be able to serve as a new impetus for the audit industry to move forward in a new direction [23]. At the same time, it is also articulated that the application of blockchain technology by companies will have a double impact on auditor's behavior; on the one hand, it will reduce the auditor's workload and the auditor may reduce the audit pricing, on the other hand, the auditor may charge a higher risk premium for audit risks due to the difficulty of understanding blockchain technology, and thus increase the audit fees [24], and some scholars argue that blockchain technology can also improve the ease of tracing transactions in the audit process, build an immune system of "audit intelligence plus", and improve the authenticity and integrity of audit data [25].

2.2.2 Digital Finance

Digital finance refers to the mode in which financial institutions and Internet platforms realize financial services such as payment, settlement, financing and investment through digital technology [26], and digital finance is a financial innovation activity based on digital technology. In addition to digital finance, fintech and Internet finance are also commonly used to describe this new financial industry [27], where digital finance is conceptually similar to "Internet finance" and "fintech", but with a slightly different focus, with Internet finance focusing on Internet finance focuses on Internet companies engaging in financial business, while fintech highlights the role of science and technology in promoting financial innovation [28]. The development of digital finance in China began with the digital economy and settlement, and the e-commerce platform was developed on this basis, which in turn promoted the further development of the digital economy. The digital finance in China has taken shape. In recent years, the emergence of third-party payment, online credit and digital money, and the rise of digital finance companies such as Jingdong Finance and Ant Financial have led to the rapid development of digital finance in China and greatly improved the convenience of digital finance services [29]. Digital finance has profoundly contributed to the country's macroeconomic development, and some scholars also find that digital finance development shows a U-shaped impact on subjective well-being [30]. Foreign scholars have found that the application of digital financial technology is conducive to shortening loan approval time [31], the

2.2.3 Big Data

Data is the basis of empirical economics, the factor behind the formation of economic indicators, and plays an important role in various fields such as macroeconomic research, policy making, economic theory validation, companies responding to market development, and individuals making economic decisions [32], while big data is the data basis of big data analysis capability, a data set from heterogeneous and autonomous resources, whose scale exceeds the traditional processes or traditional tools to capture, store, manage, analyze and utilize data, storage, management, analysis and utilization of data [33], the practical application of big data in the era of digital economy is mainly manifested in its powerful data acquisition capability, data integration capability, data processing capability and data visualization capability [34], and studies have summarized the application characteristics of big data as the life cycle, stakeholder and circulation characteristics of big data resources [35], which together have an important effect on big data These features together have an

important impact on the value realization and risk management of big data. Auditing in the Big Data-based environment also faces new opportunities, as the massive data provided by Big Data can better determine the scope of audit work, identify the risk of material misstatement and check risks, and can curb financial fraud to a certain extent [36], thus improving the reliability and audit quality of audit work. Similarly, the application of big data in the field of auditing also faces many problems such as unclear understanding and insufficient technology, the essence of these problems is that big data faces difficulties in cross-domain applications, for which the path of big data auditing implementation such as fitness analysis, time element analysis, quantitative definition, data pre-processing, and result research and judgment is needed [37].

2.3 Digitalization and Audit

Most scholars, when addressing the impact of digitalization on auditing, focus more on the impact of the introduction and use of digital technology on audit cost, audit risk, audit quality, and audit evidence.

2.3.1 Digitalization and Audit Fees

Appelbaum et al. and Warren et al. argue that technologies such as big data and blockchain will cause a certain degree of uncertainty in the business of recognition, measurement and reporting of corporate finance [38], which will affect the risk of material misstatement to a certain extent and thus audit fees. Existing domestic research on digitalization of companies is more focused on audit fees and pricing, in this regard, some scholars articulate that digitalization of companies will increase audit pricing and audit fees, for example, Yuehua Zhong et al [39] analyzed the data of A-share listed companies in Shanghai and Shenzhen from 2011 to 2020 and found that digitalization of companies will increase their risk of material misstatement, which will lead to auditors charging higher The analysis by Wu Wuqing et al. Wu Wuqing et al [40] also concluded that the level of informatization of the audited entity increased the audit fees. Yang et al [41] analyzed that the use of big data and blockchain technologies by listed companies would increase the strategic, operational, and financial risks of companies, which in turn would increase the risk of material misstatement and raise audit fees, and they also argue that the application of these technologies could improve the security of data information, thus reducing the risk of material misstatement and lowering audit fees. In a study on the relationship between digital finance and auditing, Luo Ling et al [42] found that the risk of material misstatement is increased in companies using digital financial services, and auditors charge higher audit fees to auditees as a result. However, some scholars hold the opposite view, such as Wang Yu-pai [43], who found a significant negative relationship between digitalization of firms and audit pricing, i.e., digitalization of firms reduces audit pricing. Yongshen Zhang et al [44] argue that digitalization of companies can reduce audit risk and audit cost and thus reduce audit fees. This shows that there is some disagreement among academics on the research of digitalization on audit fee pricing.

2.3.2 Digitalization and Audit Risk

In the existing literature, studies on the impact of digitalization on audit risk have focused on the relationship between the impact of digitalization on firms' audit capability and audit risk. Chen et al [45] argue that the application of digital technology enhances the effectiveness of firms' internal control, thus reducing the control risk of firms. Ling Hua et al [46] concluded through their analysis that the digitalization of companies reduces the audit risk of companies through the path of internal control optimization and information disclosure, and this effect is more obvious in non-state companies. Zou Meifeng et al. [47] argue that the increased digitalization of firms can significantly reduce the audit risk assessed by auditors, and that this effect is more pronounced in non-Big 4 firms. Thus, many scholars have concluded that digitalization can reduce audit risk to a certain extent and that this risk reduction is more significant in non-state companies and non-Big 4 firms, showing that the market has a strong role in driving and promoting digitalization.

2.3.3 Digitalization and Audit Quality

There are more studies on audit quality in academia, but less attention has been paid to the impact of digitalization on audit quality, and some scholars have provided insights. Most scholars hold that the digitalization of companies can improve audit quality, for example, Zhai Huayun et al [48] argue that the digitalization behavior of companies can reduce company risk and improve information transparency to a certain extent, which in turn can improve audit quality. Chao Xu et al [49] concluded that the application of blockchain in companies can improve the integrity, traceability and reliability of audit data, thus improving audit quality, after conducting a study on blockchain auditing. Ling-Yan Zhou et al. [50] proposed that the application of "blockchain + XARL" technology can reduce data conversion costs, reduce audit risks, improve the efficiency of internal audit, and thus improve audit quality.

2.3.4 Digitalization and Audit Evidence

In recent years, research on digitalization of companies and audit evidence has focused more on the quantitative and qualitative improvement of audit evidence by digitalization, and J. R. Zhang et al [51] found that digitalization of companies can effectively improve the accuracy and breadth of audit evidence collection, while social network analysis based on big data can improve the ability of CPAs to distinguish information. Chen Geng et al [52] proposed through the study of audit evidence under blockchain technology that realizing digital deposition of audit evidence can effectively improve the authenticity and integrity of audit evidence. Some scholars also articulate that the digitization of companies will weaken the effectiveness of audit evidence to a certain extent, such as Wang Xiuping [53] finds that the digitization of audit files in audit operations weakens the ability to prove audit evidence, so it is important to ensure the originality of documents and the integrity of attachments provided by the audited entity.

2.3.5 Digitalization and Other Audit Research Directions

Regarding the impact of digitalization on other audit directions, studies in the academia have covered audit internal control, auditor ethics, audit authenticity, and audit decision-making. Li Fengdai [54] argues that the digitalization of companies can promote the function and effectiveness of internal audit; Lu Qianyu [55] finds through her research that big data can have a significant impact on audit concepts, audit models, audit efficiency, and audit techniques and methods; Zhang Qincheng et al [56] find that the digitalization of companies can improve the efficiency of risk assessment, enhance the effectiveness of information communication, strengthen the internal supervision mechanism, and thus promote the improvement of company internal control and create an internal environment of collaborative control; Gao Tingfan et al [57] in their study on blockchain and auditing concluded that although new technologies such as blockchain have impacted traditional industries such as auditing, new technologies often bring about efficiency improvements, so it suggested the need to pay attention to institutional innovation and talent training; Wang Fan et al [58] in their study found that the degree of informationization of companies regulates the relationship between moral intensity and the relationship between moral cognition, moral intensity and moral judgment, and analyzed the dialectical relationship between the degree of informatization and digitization of companies and auditors' moral level;

2.4 Summary

In studying the impact of digitalization on audit pricing and fees, the existing literature focuses on the impact of digitalization on audit audit risk. Through model construction and data analysis, it is concluded that digitalization increases or decreases audit pricing, and the relationship tends to be that digitalization enables firms to obtain more diverse audit data and more rapid transmission between data, which somehow affects firms' risk of material misstatement, and which in turn affects the firm's audit pricing. In the special study on digitalization and audit risk, most scholars hold that digitalization can significantly reduce audit risk, including the risk of material misstatement and inspection risk,

but the existing research and empirical evidence on inspection risk is relatively small, and the research on the degree of digitalization and audit risk needs to be verified by more in-depth research.

3. The Risks of Digital Audit

Based on the above review, it can be seen that the digitalization of companies can reduce audit risks and audit costs to a certain extent, and also enhance the adequacy of audit evidence and audit quality. However, we cannot ignore the fact that some scholars have come to the opposite conclusion after research and analysis, and this impact is often more obvious in non-Big 4 firms, so we need to recognize the two-way nature of audit digitalization, which brings not only opportunities but also challenges and risks to companies, including digital audit supervision, audit information security, and organizational change.

3.1 Audit Supervision

The application of new technologies for digitalization to improve audit efficiency presupposes ensuring that the new technologies are used rationally, a process that requires effective supervision by an impartial third party, as well as promoting the collaborative evolution of the audit profession and giving full play to the intrinsic functions of auditing [59], in order to better exploit the advantages of digital auditing.

3.2 Audit Information Security

The "14th Five-Year Plan" emphasizes the importance of information security and privacy protection, and the application of new digital audit technology makes audit information collection more efficient, but also increases the risk of audit information security and makes it more difficult to protect audit information. Based on this, companies should pay attention to the training and application of professional talents in data organization and protection when protecting audit information, and establish a sound audit database protection and emergency mechanism to enhance the security and risk response capability of audit data.

3.3 Audit Organization Changes

The digitalization of company audit involves the change of company audit organization, which requires reasonable internal and external cooperation as well as resource integration of audit organization, however, because the traditional audit organization is a vertical organizational structure, each audit team often completes the whole process of audit projects from planning to reporting alone, and the audit resource allocation lacks flexibility and does not adapt to the data-based audit model [60], so the digitalization process will create some risk to the change of audit organization.

4. Future Outlook

The digitalization of companies can bring greater opportunities and challenges to company audit, in the face of the reality of the in-depth development of information technology digital environment, companies in the direction of digitalization to increase investment will become the right thing to do, at the same time the audit industry application of digital technology also makes the audit and other industries intrinsic links increase, this change makes the audit industry talent requirements standards increase, the audit industry in the face of digitalization Need more professional composite talents, however, because the current update of the talent training program lags far behind the speed of development of information technology, in the audit of the talent training program is not yet fully reflected in the curriculum of the cloud area [61], digital audit direction of the audit professionals may be a shortage of phenomena, companies face this problem need to analyze and research in advance, appropriate adjustment of company human resources Planning, so that it is compatible with

the digitalization strategy of the company, and strive to cultivate a team of digital audit professionals, so as to lay a solid foundation for the audit work of the company in the digital era.

Audit digitalization is still in the development stage, with a large upside, companies should take the initiative to follow up, seize the opportunity of digitalization, grasp the basic functions of the audit while promoting digitalization, audit digital will have a broader development prospects.

5. Conclusion

digitalization has become the way to sustainable development of corporate auditing in the digital era, and digitalization will play a crucial role in the development of corporate auditing. The summary and combing of the existing literature show that there are more academic studies on the development of auditing in the digital era, and most scholars have pointed out the problems and solutions faced by corporate auditing in the information age, and the research content is rich, with the basic starting point of subdividing the digitalization of companies into blockchain, digital finance, big data and other directions to expand the elaboration, and to demonstrate the relationship between these subdivisions and audit pricing, audit risk, audit evidence and other aspects, and to draw conclusions through empirical data analysis, The relationship between these segments and audit pricing, audit risk, audit evidence, etc., and conclusions are drawn through empirical data analysis. In general, more scholars find that digitalization can promote better development of corporate auditing, while some scholars also argue that digitalization is a challenge for corporate auditing, which needs to be adjusted and improved from various directions such as internal control, government supervision, and management system innovation.

In the face of digitalization, companies should first of all reasonably grasp the opportunities and challenges in the process of digitalization, correctly understand the capabilities they have and the reality of the company, reasonably analyze the current financial situation and business model of the company, and the management should have an overall grasp of the development status of the company and actively face the possible increase in production chain renewal costs, personnel costs, management costs, etc. in the process of digitalization. Promote companies to find their own digital development mode, and help them develop more healthily and stably in the information technology era through blockchain, digital finance, big data, etc. At the same time, companies also need to pay attention to the national policy on digitalization, pay attention to the training of information technology talents, digital infrastructure construction and maintenance, to ensure the security of audit data and other factors, in order to effectively ensure the good development of company audit in the context of digitalization.

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