Research on the application of big data technology in financial audit data analysis

Junhao Fu

Jiangxi University of Finance and Economics, Nanchang, Jiangxi, 330013, China

fjh2220705@163.com

Keywords: Big data technology, Financial audit, Audit data

Abstract: Regarding the research on applying big data technology in financial audit data analysis, it is necessary first to clarify the reform and new positioning of the national audit system in the new period. And then combine it with the impact of data on the development of financial audits to analyze the key points of applying big data technology in financial audit data analysis. The study comes up with three strategies for establishing a perfect financial audit platform and system, focusing on actively updating the methodological model and establishing a high-quality talent team of big data technology, hoping to contribute to improving the financial audit data analysis level.

1. Introduction

With the continuous improvement of modern science and technology, cloud computing, the Internet of Things, and big data have gradually become the main driving force for innovation and development in various industries. Big Data technology, in particular, has been widely used in multiple fields by its advantages of centralization, refinement, integration, and sharing massive data. Taking the application of big data technology in financial audit data analysis as an example, the application of big data technology not only promotes the innovation of audit methods and models but also effectively enhances the level of data analysis and management. Based on the concept of full audit coverage, the application of this technology has eliminated the errors caused by traditional manual audit data analysis to the greatest extent possible and has played an indispensable role in contributing to the innovation of the financial supervision system and the maintenance of financial order. It is thus clear that, while taking into account the actual situation and specific requirements of financial audit data analysis, a deeper exploration and study of the strategies and key points of the application of big data technology has become an urgent task for audit units in the new period.

2. Reform and new positioning of the national audit system in the new period

2.1 The reform and change of the national audit system in the new period

Firstly, the supervision object of audit units in the new period has changed from micro entities to whether the units are implementing macro policies and the actual implementation. Auditing must therefore raise thinking to a macro level and ensure an in-depth understanding of the operating mechanisms and key points of macro policy to ensure that macroscopic management can play an essential role in the true sense of the word. Secondly, audit units in the new period are no longer part of the government but rather serve as political organs of the party to carry out audit supervision. Therefore, audit units should pay more attention to the political status of audit work. Thirdly, audit units are now required to carry out comprehensive cross-sector and cross-departmental data analysis instead of being responsible for analyzing reports, business statistics, and finance. This approach can eliminate, as far as possible, the blind spots in cross-sectoral supervision. The comprehensive and independent nature of auditing is clearer and more conducive to developing full-coverage audit supervision [1].

2.2 The main steps of national audit in the new period

The broad steps of financial auditing in the new period include the following three main steps. First, use the budget implementation audit platform, the economic responsibility audit platform, and the policy tracking audit platform as the base. Secondly, with the help of big data analysis and coordination tools, financial audits identify and timely prevent and manage major economic and financial risks. Thirdly, the financial audit has directed financial services mainly toward the real economy, vigorously promoting financial reform and strengthening regulatory performance while cracking down on corruption. In contrast, the content of financial auditing in the new period focuses on preventing and avoiding potential risks. On the one hand, audit units need to pay more attention to traditional financial risks such as credit, operational risk, reputation, and liquidity. On the other hand, the audit units also need to pay sufficient attention to government debt, SOE debt, shadow banking, real estate bubbles, criminality, and other external shock risks. Areas closely linked to traditional finance have become increasingly prominent in recent years and are gradually shifting towards interacting, driving, and transmitting risks [2].

3. The impact of big data on the development of financial audit

Financial audit data analysis using big data technology means comparing and analyzing various financial institutions' financial and operational data. Auditors then combine multiple data from finance, taxation, industry and commerce, social security, and other areas to conduct comprehensive analysis across industries and geographies to determine the existence of various financial risks. This paper summarises big data's impact on the development of financial auditing as follows.

Firstly, the financial industry is practically always at the forefront of information construction, so it can use the ability of big data technology to mine and analyze massive amounts of data to study the links between data and expose the potential risks involved. Secondly, auditors can minimize the negative impact on the financial industry caused by, for example, shadow banking or external risk shocks by using big data to carry out their audit work. On the one hand, auditors can prevent the industry from going astray through scrutiny and supervision, and on the other hand, they can raise awareness of risk prevention and governance [3]. Third, big data technology has laid the foundation for constructing a smart financial audit system. At the same time, big data technology also provides indispensable technical support in the process of financial auditing's transformation into digitalization. Based on offering impetus to financial audit model innovation, big data technology is of great significance to the overall innovation of China's financial industry. Fourth, nowadays, the innovation of the financial industry has entered a mature period. Fourthly, innovation in the financial sector has now reached a mature stage. The research and application of digital and intelligent financial audit data analysis technology, supported by big data technology, can break down the obstacles encountered in the reform more quickly and effectively. It will enable financial institutions to be alerted to risks in advance so that financial innovation can progress more smoothly. Fifth, big data technology has the advantage of multi-dimensional data analysis and information sharing, so clues and evidence of financial institutions' irregularities are more easily discovered, thus facilitating financial supervision services to achieve deeper expansion. It is conducive to giving full play to the role of financial audit in anti-corruption and promoting the financial industry's more orderly and healthy development [4].

4. The key points of applying big data technology in financial audit data analysis

4.1 Establish a perfect financial audit platform and system

Firstly, the auditor should establish good long-term relationships with closely linked industries such as banks, insurance, and securities firms so that raw industry data can be accessed and backed up. Then the audit unit should arrange professional technical departments to carry out centralized management and hierarchical management of the platform's operation, management, and maintenance to provide the highest guarantee for the security of information data use and storage. In

addition, audit units need to pay sufficient attention to unifying business data. While actively updating the application functions, audit units should also consider that the various functional modules should be closely linked and independent of each other. Timely and enhanced security log management is a powerful step towards bringing the quality of audit information management up to standard and can facilitate the efficient and orderly conduct of financial audits [5].

Secondly, audit units should use big data technology to optimize data collection, storage, management, and analysis. It is a necessary way to make financial auditing and data processing more standardized and scientific. Specifically, technicians can use Hadoop distributed storage to reconnect otherwise discrete data units while choosing the most appropriate storage strategy based on the data type. It allows for data interfacing and provides a greater opportunity to identify audit suspicions and evidence. In addition, technicians can use SQL queries and expert experience models as a reference to improve the accuracy of structural data analysis and use keyword query techniques to analyze meeting records, etc., to achieve the purpose of financial risk monitoring and timely detection of vulnerability issues.

Finally, the big data financial audit platform should fully protect consumer rights so that financial audits can achieve further innovation and development. Under the supervision of a big data financial audit platform, financial institutions will be more conscious of protecting and respecting consumer rights. Platforms should also create good disclosure systems to avoid, as far as possible, a significant information mismatch between financial institutions and consumers. At the same time, financial institutions should ensure that consumers have easy and prompt access to disclosure information when needed. Auditors should also check the disclosure of information by financial institutions from time to time to make it more standardized [6].

4.2 Focus on actively updating the method model

Auditors can integrate networked auditing technology with big data technology to achieve continuous auditing, i.e., the supervisory review of financial transactions of financial institutions has a continuous character. Compared to the traditional audit model, continuous auditing eliminates the drawbacks of regularly reviewing a sample of financial institutions and provides greater objectivity and authenticity. Continuous auditing is also simple to implement, with technicians embedding the appropriate program modules into financial institutions' information systems to automatically track real-time data on financial transactions. As continuous auditing is an automatic execution control method, it is easier to detect anomalies and risks when analyzing financial operations data at a high frequency. Continuous auditing also ensures real-time data mining and correlation analysis, which can accurately and quickly find the evidence needed for an audit after comparing financial data with other data [7].

In addition, the audit unit should also put the financial audit model based on big data technology on the agenda as soon as possible. When building financial audit models, technical staff can present expert experience in the form of modeling or use machine learning as a basis. This approach has proven to have significant advantages over traditional auditing methods. It can improve the efficiency and accuracy of financial audit data analysis, enhance the accuracy of audit evidence collection and financial risk monitoring, and provide more comprehensive and powerful data to support risk prevention and decision-making.

4.3 Establish a high-quality big data technology talent team

Audit units should focus on developing a talent pool for auditing with big data technologies. Firstly, they can use internet resource courses, where senior education experts within the industry guide them to explore new issues in big data technology and financial audit data analysis. When unified training is not possible, audit units should also focus on developing good habits of independent learning among auditors. In addition, audit units should establish partnerships with local universities and research groups to build research-based internet communication platforms. It will allow research-based auditors to share their work experience and interact with each other through questions and answers, helping them use the fragmented time they have in their daily work to improve themselves.

Secondly, in training auditing talents in big data technology, audit units should focus on establishing themselves in the spirit of auditing, establishing their career with innovative norms, and establishing their trust by building themselves. Only by building a sound mechanism for training big data audit talents and giving them sufficient audit discourse can they truly meet the challenges of audit innovation that come with the big data era. Suppose audit units want to ensure the effectiveness and quality of full-coverage audit business practices. In that case, they should also pay attention to the cultivation of comprehensive thinking among auditors and enhance their cross-business processing as much as possible so that comprehensive audit talents always meet both quantitative and qualitative needs [8].

Once again, audit units should guide auditors to establish big data awareness so they can truly take the audit project as a starting point to launch an overall analysis. And use big data to promptly discover problems or doubts and promote the effective improvement of applying financial auditing techniques. Specifically, audit units can use the big data collated during training to help auditors exercise their ability to grasp audit priorities. The auditors also need to have a good understanding of the financial institution's operations, and using data analysis as a core will ensure that the implementation plan is well developed. It will also help auditors to accumulate valid data, increase the efficiency of data collation and reduce the chance of collation errors, and provide greater ease of access to and use of audit data.

Finally, in addition to developing auditors' big data skills, modern technologies such as artificial intelligence and statistical modeling can also enrich audit business methods, enabling audit capabilities and quality and effectiveness to be enhanced. Audit units should provide institutional safeguards for implementing big data audit talent policies. The audit unit should also invest in appropriate costs to fund the development of a pathway for training big data audit talent, with corresponding reward and punishment mechanisms. In this way, auditors who improve themselves can be praised or rewarded. If auditors achieve scientific research results, they should be given priority in merit assessment, establishment implementation, and job promotion to mobilize their creativity and enthusiasm fully[9].

5. Conclusions

In summary, applying big data technology to financial audit data analysis in the information age enhances the efficiency and quality of financial audits and injects fresh vitality into financial audits. Specifically, integrating big data technology and financial audit data analysis can maximize the comprehensiveness and systemic nature of all types of data analysis in financial auditing. It ensures that auditors can detect audit suspicions and evidence in a timely and effective manner while enabling the ability to monitor and prevent financial risks to be fundamentally enhanced, further creating a safer and better environment for businesses to grow.

References

[1] Tengfei Ge, Zhongshuai Bai. Research on the application of big data technology in financial audit data analysis [J]. International Business Accounting, 2022(3): 5.

[2] Jiang S. Research on big data audit based on financial sharing service model using fuzzy AHP[J]. Journal of Intelligent & Fuzzy Systems, 2021, 40(4): 8237-8246.

[3] Xueshen Sui. Big data construction: the future road of smart financial audit [J]. Audit observation, 2019(10): 4.

[4] Cao M, Chychyla R, Stewart T. Big data analytics in financial statement audits[J]. Accounting Horizons, 2015, 29(2): 423-429.

[5] Jianlin Hou. Research on the impact of big data and cloud computing technology on audit [J]. New Financial World, 2019,000(004): 120-121.

[6] Yanbo Wang, Jinghua Shi, Jun Zhang. The application mode system of big data audit of

commercial banks [J]. Banker, 2019(8): 5.

[7] Yuqing Jiang. The application and challenges of big data in audit innovation [J]. Economic and Social Development Research, 2020(14): 1.

[8] Youxin Huang. Research on financial audit management under big data technology [J]. SME Management and Technology, 2021(21): 2.

[9] Zhongli Bi. Research on the countermeasures of big data financial audit to prevent financial risks [J]. Market Weekly · Theory Edition, 2021(20): 2.