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Research on Fraud Audit of Listed Companies based on Blockchain Technology

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Abstract

In the current era of the digital economy, an indispensable condition for healthy and stable operation is that the financial information released by listed companies must meet the requirements of timeliness, authenticity, accuracy, and effectiveness. However, in recent years, fraud incidents of listed companies in my country have occurred frequently. The reason for this is that these endless fraud scandals are mainly caused by information asymmetry between investors and managers, imbalances in corporate governance, and the lack of independence of CPA audits. How to efficiently solve these problems has become an urgent problem for listed companies in my country. At this time, blockchain technology stands out due to its "decentralization", distributed social account books, cryptographic algorithms, and highly transparent information. In 2008, Satoshi Nakamoto scholars proposed the concept of blockchain, and these functions of blockchain It coincides with some of the technologies needed to overcome the problem of fraud auditing, so the birth of blockchain technology is bound to have a huge impact on the fraud auditing of listed companies in my country.The hot topic of blockchain technology has attracted the attention of all sectors of society in recent years. Scholars at home and abroad have also done a lot of related research on this, involving the application and development of blockchain technology in various industries in society. Explore. However, in terms of the application of blockchain technology in the audit industry, most of the current research stays at the macro level of the technology's disruptive impact on the entire fraud auditing field, while the blockchain technology solves certain problems in the accounting and auditing industry. There is little research on the application of a specific problem and its practical significance. The focus of the research in this article is mainly to propose innovative solutions based on blockchain technology for the current problem of fraud audits of listed companies that hinder the healthy development of the market.

Keywords

Digital Economy; Blockchain; Fraud Audit; Listed Companies.

1. Research Background and Significance

In recent years, decentralized blockchain technology has been highly sought after in all fields of the world. Its strong strategic significance and commercial value have attracted the competition from all walks of life around the world. The development prospects of blockchain technology and the disruptive impact it can have are huge. After analyzing the application prospects of blockchain technology, China listed it for the first time in the "13th Five-Year Plan" national informatization at the end of 2016. planning. In the past few years, the rise of information technology such as cloud computing has had an important impact on the accounting field. In the

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near future, blockchain technology with huge potential may have an even more unparalleled impact on the development of the global economy and the reform of the accounting system.

In theory, the topic of blockchain technology has attracted the attention of all sectors of society in recent years. Scholars at home and abroad have also done a lot of related research on this, involving the theory and development of blockchain technology in various industries in society. Explore. However, regarding the theoretical content of blockchain technology in the audit industry, most of the current research stays in the prospect of the technology's disruptive impact on the entire audit field at a macro level. The research model of "blockchain + audit" is not yet mature. There are few researches on the blockchain audit theory and its practical significance.

At the same time, the research on the operation mode of audit process and audit work has enriched and developed the blockchain audit theory to a certain extent, which is conducive to the innovation of audit theory and practice and promotes the establishment of a blockchain audit standardization system. Not only that, this article also discusses the key content of the current audit work development under the blockchain technology, and gives relevant suggestions one by one, which enriches the relevant research theories of "blockchain + audit" in my country.

2. The Impact of Blockchain Technology on the Financial Fraud of Listed Companies

Through an in-depth analysis of the difficulties and causes of fraud audits of listed companies in my country, we can explain the concept and working principle of blockchain technology, and apply blockchain technology to understand the situation of listed companies, risk identification and risk response. Possibility, further explore the advantages of combining it with fraud audit from the three perspectives of preventing and managing fraudulent behaviors of listed company management, reducing audit risks, and reducing audit costs. At the same time, it analyzes the specific aspects from the three perspectives of security risks, process restrictions, and lack of systems. Use the existing obstacles.

The impact of changes in audit carrier and audit risk on audit evidence collection in financial audits. In terms of fraud audit and evidence collection methods, in the blockchain environment, the audit carrier related to financial information is basically electronic. The blockchain platform is an information system or network system, and the information designed and operated is also electronic, so based on Considering the efficiency of auditing, in this case, the audit evidence collection method mainly adopts the off-site audit evidence collection method of listed companies. In terms of fraud audit and evidence collection mode, the risk that auditors should pay attention to is whether the blockchain platform can guarantee the authenticity of financial data. Therefore, audit evidence collection is to obtain audit evidence around the integrity of the blockchain platform itself, not The audit evidence is obtained around the financial data of listed companies. In fact, the audit subject has been transformed from financial information to the information system or network system of the blockchain platform, which belongs to the institutional subject. As far as the financial audit evidence collection method is concerned, the audit subject has been Converted to a financial information-related blockchain platform, this information system or network system, the method of obtaining audit evidence around financial information basically loses its value, for example, letter of evidence, supervision, and recalculation basically lose value, and the value of review is also great Decrease, sampling audits to verify the authenticity of financial information also lose their value. On the contrary, the value of evidence collection methods related to audits of information systems or network systems is greatly increased.

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An important reason for the frequent occurrence of financial fraud is information asymmetry. The existing information release form of listed companies in my country is generally a "centralized" model, and behaviors such as tampering with the company's financial data to complete the preset annual goals are exploiting the loopholes of the "centralized" model. The "decentralized" model is the opposite. It minimizes the problem of information asymmetry, and achieves open, transparent and real-time sharing of company financial information. In the vertical model of the blockchain financial system, applying the blockchain technology that uses the principle of distributed accounting to the application layer means that the company's employees can discuss what has happened through the entire network at any node. And all transactions and matters that are verified to be correct are recorded in the financial system, and the records in the blockchain system will be audited by stakeholders. Therefore, all important shareholders, customers, and suppliers can use their own account and password to log in to the system to learn about the company's true and complete financial status and operating results. This fundamentally kills the "information asymmetry" loopholes that provide listed companies with opportunities for fraud audits.

3. Research on the Construction and Operation Mode of Blockchain Audit

3.1. The Basic Model of Blockchain Technology Application

There are many types of systems formed by blockchain technology, but no matter which system it is, its basic core structure and working principles are the same. Generally, what we describe is the most basic blockchain technology system structure, and other complex structures are extended from this structure. These five small parts interact with each other to form the blockchain software. After running, they form a node, and the joint operation of such nodes from different regions forms a network. In this network system, each node has an equal status, and their interaction forms a peer-to-peer "peer-to-peer network".

Block data is mainly composed of block headers and block bodies. The intermediary factor that can be connected between blocks to form a chain is the hash value of the previous block header. Through this format, the continuous data is divided into small pieces. Any node in the network can download and synchronize these data blocks, and finally connect them in series according to the hash value. One of the most powerful features of this chain is that it is interlocking, making it difficult to tamper with data. Explain the operation process of the blockchain technology system in detail.

Its core technologies include distributed data storage, asymmetric encryption, consensus mechanisms, and smart contracts, which have the characteristics of disintermediation, non-tampering, traceability, openness and transparency, and programmable. The decentralization of blockchain technology refers to the use of distributed accounting. Any node can completely and truly record and store transactions that occur in the entire network. This is the most essential feature of blockchain technology. Other features can be said to be here. Derived from a feature. The immutability of blockchain technology means that it is almost impossible for any node to tamper with the data on the transaction record. There are three reasons. One is that if any node wants to modify the recorded data, it needs to change no less than 51%. Node data can only be realized, which is almost difficult to achieve; second, the hash algorithm needs to permanently store the verified data on the network, and the tampered data cannot be verified by the hash algorithm; third, the time stamp function of the blockchain technology guarantees The transaction data is recorded in time sequence, and the irreversibility of time ensures that the data chain is difficult to tamper with.

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3.2. Construction of Fraud Audit Platform based on Blockchain

Challenged by big data and cloud computing technology, the traditional audit business is facing rapid transformation. Blockchain technology builds a public platform for each transaction on the network by distributing trusts of authoritative intermediaries to a large global network, combining collective collaboration, ingenious program codes and codes. Based on the advantages of Rubix system in enterprise internal audit application, combined with the characteristics of internal audit business, build a blockchain internal audit platform.

The main function of the blockchain technology resource server is to store the transaction data of the audited entity. Through the data interface, the consensus mechanism enables participants to reach an efficient consensus on transaction information, and realizes the data exchange between the online real-time audit system and the financial processing system . Before the audit begins, the audited unit will be connected to the blockchain audit platform to ensure the normal operation of network equipment and data transmission channels. The consensus mechanism can verify and confirm transactions and data stored on the blockchain in real time, and expand the scope of audit. The data layer and network layer of the audit platform are recorded and updated in real time through intelligent technical elements such as language analysis, image and voice recognition.

The influence of the traceability characteristics of blockchain electronic data on the audit carrier. There are many transactions recorded in the blockchain platform, and there are many electronic data recording these transactions. However, the data of different links of the same transaction operation has the characteristics of traceability, and the subsequent data can only record new changes and identify their differences. The relationship between the original data, stringing all the data together, can clearly see the context of a specific related electronic data change, and can completely retain the traces of the transaction data generation and modification process. Because of this feature of blockchain electronic data, when blockchain electronic data is used as an audit carrier, on the one hand, it guarantees the authenticity of these electronic data. On the other hand, it helps auditors trace the trajectory of a transaction to obtain information The audit evidence of the transaction laid the foundation.

4. Implementation Research on the Development of Blockchain Technology Audit of Listed Companies

The hash time stamp function of the technical layer in the vertical model of the blockchain technology system can add a time dimension to the company's transactions and events. All transactions are truly and completely recorded in the financial system in chronological order, which directly gives the financial data "traceability". A listed company can divide a large block into multiple small blocks according to the Merkle tree structure, and then compare the data blocks with errors, so that there will be no errors in the audit process. Suppose B buys a batch of goods from cosmetics sales company A and wants to transfer the goods to company A. First, B will send out the transaction of preparing to make payment to A, and a new block with a unique hash value will be formed. Then the transaction will be publicly released on the entire network, and other receiving nodes will have to tell the truth about the content of the information transmitted by the other party. After verification, the transaction will be recorded as the current end block of the blockchain to all other nodes in the entire network. Then B will complete the payment to A company, and finally each node will maintain its own data. Keep the data consistency of all nodes in the entire network. Finally, the CPA can complete the audit task efficiently. To sum up, the workflow of the blockchain technology system mainly revolves around letting all nodes in the network participate and maintain a public ledger by broadcasting and receiving data to ensure that the data is not tampered with.

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An important external reason for the repeated prohibition of financial fraud in my country's listed companies is that government departments have not performed their external supervision functions well due to overlapping functions and other reasons. Because the distributed accounting system of blockchain technology can synchronize the information of all nodes in the entire network, if we can add this technology to the supervision of the financial status of the enterprise by various government departments, then each department can be in advance The network publishes the supervision work that it is going to do and in the future can upload it to the whole network in real time, clearly and accurately when and where they are done. At this time, it is clear at a glance what work has not been done. Other departments will You can choose some from the remaining work according to your own spare capacity, so as to avoid the problem of repeated supervision by various government departments.Auditors should focus on whether the blockchain platform can guarantee the compliance of listed company transactions. In fact, the audit theme has been transformed from economic behavior to a blockchain platform, and this platform itself is a kind of application of blockchain Technical information systems or network systems belong to the subject of the system. Audit and evidence collection needs to be conducted around whether the blockchain platform can guarantee transaction compliance. The audit evidence collection model is similar to information system audit. As far as the methods of obtaining evidence from compliance audits are concerned, due to the change of audit themes, the audit procedures that focus on the compliance of economic behaviors to obtain audit evidence lose their value, while the value of the audit procedures that focus on whether the information system is sound has greatly increased. For example, sampling audits to verify the compliance of economic behavior also lose value.

As far as financial audit is concerned, the audit subject is financial information, and the audit objective is the authenticity of financial information. The audit risk model is as follows: financial audit risk = financial information fraud risk × inspection risk. In the blockchain environment, the authenticity of electronic data is guaranteed. Therefore, the risk of financial information fraud is very low. It is precisely because the risk of financial information fraud is very low, the tolerable inspection risk is high. It is precisely because the tolerable inspection risk is very high. Under normal circumstances, the authenticity of the financial information of a listed company does not need to be based on the inspection risk to design and implement further audit procedures to obtain audit evidence. The key is to obtain evidence to prove the block. Whether the chain platform can really guarantee that the risk of financial information error and fraud is very low. Therefore, in the blockchain environment, the risk of financial information audit is no longer an inspection risk, but an assessment of whether the blockchain platform that generates financial data can protect electronic The authenticity of the data.

As far as compliance audit is concerned, the audit subject is economic behavior, and the audit objective is compliance with economic behavior. The audit risk model is as follows: compliance audit risk = economic behavior violation risk × inspection risk. In the blockchain environment, the risk of economic violations here refers to whether the transactions running in the blockchain comply with relevant laws and regulations, and these relevant laws and regulations are built into a specific blockchain platform through a consensus mechanism and smart contracts. In China, all transactions in listed companies that pass through the blockchain platform must comply with these laws and regulations. In this environment, transactions that do not comply with these laws and regulations are difficult to run on the blockchain platform. Therefore, for the transactions of listed companies running on the specific blockchain platform, there is a possibility of violating these laws and regulations. Sexuality is almost non-existent, the risk of economic behavior violations is very low, and the tolerable inspection risk is high. Therefore, generally speaking, it is not necessary to design and implement further audit procedures based on the inspection risk. Of course, the key here is whether the laws and

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regulations built into the specific blockchain platform through the consensus mechanism and smart contracts can ensure that transactions comply with these relevant laws and regulations. Therefore, auditors need to obtain audit evidence in this regard.

5. Summary

The "blockchain + audit" project can effectively analyze the current situation of financial fraud in listed companies in China, and at the same time conduct research on the unique characteristics of blockchain technology, and analyze its positive impact on solving the problem of financial fraud , To explore the rationality and feasibility of applying blockchain technology to solve the problem of financial fraud in listed companies, hoping to apply blockchain technology to the accounting field, especially to ensure the timeliness, authenticity, accuracy and effectiveness of financial information It also provides some theoretical basis in terms of gender and other aspects, and it can also make some contributions to solving the problem of financial fraud in listed companies in China.

The blockchain makes the audit carrier change. The audit carrier in the blockchain environment exists in the form of electronic data. The characteristics of the blockchain are disintermediation, non-tampering, traceability, openness and transparency, and programmable. The authenticity of electronic data under the block chain environment provides protection and lays the foundation for the intelligentization of fraud audits for listed companies.

The "distributed social ledger system" in blockchain technology can easily conduct a comprehensive audit of the company's vouchers, account books, statements and other financial information, and can supervise and prompt relevant taxpayers to declare tax in a standardized and reasonable manner. To a certain extent, it greatly protects the right to know the financial information users of listed company statements and other financial information and their own interests. At the same time, it also enables relevant regulatory agencies and audit institutions to save costs, improve work efficiency, and improve work quality. In addition, the cryptographic principles in this technology make transaction records unchangeable, and transaction records can be traced. Accounting processing on this basis will ensure the quality of accounting information, and relatively reduce the possibility of financial fraud and data tampering. It provides a guarantee for the reliability of audit results.

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