Research on the Application of Financial Fraud Technology Governance in China

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Abstract. The problem of financial malpractice in listed companies has emerged since the beginning of accounting and has not been completely solved. Throughout the development of China's securities market in the past 30 years, although it is becoming more and more mature, the problem of financial malpractice has always been a pain point in the development of the securities market. The fundamental reason is that listed companies are driven by various interests. Therefore, employing effective methods to preclude and manage financial fraud within listed companies has become a crucial matter for market health. In recent times, blockchain has entered the public eye, and its inherent technological features make it the ideal tool for suppressing financial fraud. As such, this paper analyzes the current situation of financial fraud in China, combines the emerging technology of blockchain in China, and fits the advantages of blockchain with financial fraud. By doing so, it aims to contribute to the improvement of China's financial fraud situation, and to offer some solutions to the problem of accounting fraud in China through the application of blockchain technology.

Keywords: Financial Fraud; Technology Governance; Blockchain.

1. Introduction

Since the establishment of the securities market, the phenomenon of financial fraud in China's listed companies has been chaotic and unceasing. The root cause can be attributed to the various interests driving these listed companies. And listed companies have become a tried-and-true means of fraud by falsifying and altering financial statements, concealing connected transactions, and taking advantage of various auditing and regulatory loopholes. This situation poses a threat to the rational allocation of China's economic resources, damages investors' legitimate rights and interests, disrupts the orderly operations of China's securities market, and hinders the good and stable development of China's economy. Therefore, how to govern the financial fraud of listed companies through an effective way has become an important issue to maintain the healthy development of the market. The characteristics of blockchain technology make it the best means to inhibit financial fraud, and its specificity lays down its applicability. This article will commence by examining the present state of financial fraud and governance in China. It will also explore the role of blockchain technology in combating such fraud, and propose practical and viable solutions to tackle any potential challenges and obstacles that may arise.

2. Financial Fraud

2.1. The current situation of financial fraud in China

The number of listed companies in the A-share market, which initially consisted of the first batch of "old eight stocks," has grown substantially. As of November 2021, according to data from the Securities and Futures Commission (SFC), the total number of listed companies in the A-share market has been 4,554, and the industries involved include all 90 major categories of the national economy, so it can be said that China's securities market is in a period of booming development. But at the same time, in the short span of 30 years since 1990, there have been numerous accounting fraud scandals and financial fraud cases. It can be said that the phenomenon of financial fraud has penetrated into many industries. Through the statistics of the penalty announcement on the website of the Securities

and Futures Commission (SFC) and the data report of WIND, a third-party data organization, more than 100 listed companies have received penalties from the SFC for financial fraud between 2014 and 2021, excluding non-financial forgery penalties by analyzing the statistics of the A-share listed companies with financial fraud as the keyword.

2.2. Governance of financial fraud

In terms of governance of financial fraud, the famous Treadway Commission in the United States proposed a four-level mechanism theory against fraud in 1987. The first step is to improve management's management philosophy, Brochet & Srinivasan proposed that shareholders can employ legal actions pertaining to director elections and retention to bolster the accountability of independent directors when a company experiences financial fraud [1]; Second is to concentrate on constructing internal controls, with Laux V analyzing the optimal design of long-term executive compensation plans from an internal standpoint, forecasting that an escalation in the marginal cost of CEO manipulation enhances the optimal pay convexity [2], and that the manipulation's magnitude, which initially increases then decreases, should be identified and prevented. Once more, it involves enhancing internal audits to monitor and thwart the company's financial fraud, as well as effectively supervise the daily actions of managers [3]; Finally, to study the prevention of financial fraud from the external perspective, independent auditing plays an important role in fraud governance, and accounting firms with a high degree of independence are able to effectively govern financial fraud.

Domestic researchers have also launched some studies. Firstly, China should improve the legal norms related to financial fraud, strengthen the construction of market supervision system, and increase the punishment to create a good market economic environment [4]; Secondly, China should improve the financial information disclosure procedures of listed companies, because in many cases, external investors are unable to identify the authenticity of the company's financial information, which can lead to fraudulent behaviors [5]; Finally, to guarantee the fundamental prevention of fraud, companies must emphasize their internal structure and the ethical culture of their employees[6].

3. Blockchain

Many people don't know much about blockchain, a new product of the information age that is essentially a cryptographic distributed ledger with multiple participants. One may ask why virtual blockchain is so popular in various industries. The main reason is that it offers several technological advantages:

The first is decentralization. Blockchain network usually consists of a large number of nodes, at the same time there is no so-called centralized management structure and objects, the rights and obligations of each node on the chain are equally important, and single or multiple nodes on the chain can respond to the work instructions and work on data according to the actual needs; The second is de-trust. In traditional transactions, people usually prefer to transact through a trusted intermediary so that there is a degree of certainty in the transaction. This third-party intermediary plays the role of "trust". But blockchain creates a system of "trust" between machines, eliminating the need for a third party to act as a trust intermediary. There is no trust involved in the blockchain system, and fraud is not possible; The third is openness and transparency. On the blockchain, data information is made available to the public, except for private information related to the transaction parties which is securely stored. All other information is openly displayed to everyone, guaranteeing a system that is both open and transparent; The fourth is tamper ability. Within the blockchain network, numerous nodes exist to record information in a sequential manner. The database undergoes extension and verification, node by node. Once information is entered and verified, it is permanently stored. It is important to note that unless the operator gains control over more than 51% of the system's nodes simultaneously, any attempt to modify the database by a single node would be deemed invalid. Consequently, the credibility of records within the blockchain remains exceptionally high.

4. Blockchain's curb on financial fraud

4.1. Blockchain technology to curb financial fraud opportunities

The ERP system currently used by China's listed companies adopts a centralized accounting model. Under this model, different ranks and positions have different permissions, and the division of management functions in each terminal and center requires layers of authorization, approval and audit. Sub-accounts are eventually categorized and summarized in the general ledger to form a centralized book, but the workload is large and complex, which is prone to information asymmetry and the hidden danger of financial fraud.

In the distributed ledger model of blockchain technology, transaction information is seamlessly synchronized with the enterprise's accounting information database in real-time. This proactive approach effectively mitigates the risk of post-transaction misconduct and ultimately guarantees the authenticity and reliability of the information. Every accounting information under this model will be reviewed by every node of the blockchain, cutting down the multi-level management approval authority. At the same time, the blockchain has a unique timestamp function, as long as the information is entered on the chain, it will leave a permanent trace, and no one has the right to change, which significantly improves the difficulty of financial fraud. This also makes financial fraud technically difficult to implement, effectively weakening the opportunity for management fraud in listed companies and further reducing the space for fraud.

4.2. Blockchain technology puts the brakes on management fraud

Traditional enterprise internal control is built under the contract of asymmetric information, and the company constantly invests the cost of relevant internal supervision to obtain effective decision-making information. Today, China's accounting information system, due to the existence of internal corporate governance deficiencies as well as information asymmetry, allows the top management to manipulate financial information recklessly under their own authority. At the same time, the management's involvement in the audit work of the enterprise financial staff also brings certain troubles.

If blockchain technology is applied to the enterprise financial system, the openness, transparency and non-tampering of financial data will facilitate the implementation of internal accounting supervision. It will be difficult to tamper with financial information either out of self-interest or under the coercion of executives. Compared with the traditional internal control environment, the accounting business processing under the blockchain technology architecture is no longer relatively centralized, and each employee who handles the specific data of the economic business can independently and autonomously record it, which disperses the accounting responsibilities of the enterprise's head and accounting personnel. Only when all employees on other blocks recognize the truth of the data can it be successfully recorded. This makes the entire network of participating employees share the responsibility of writing legitimate, truthful, and complete financial information, which helps to curb various agency problems such as executive fraud and tunneling.

5. Difficulties faced and countermeasures applied in practice

5.1. Difficulties

In today's information-driven society, the emergence of groundbreaking technologies is often accompanied by speculative hype and undesired occurrences. Secondly, although blockchain technology currently has many application scenarios on the ground, they are all unfolding in localized areas. But for the prevention of financial fraud of listed companies such comprehensive scenarios are still temporarily lack of technical research support.

Once again, the cost of promoting blockchain technology is large, and there is a mutually constraining triangular relationship in blockchain technology, that is, the relationship between the

three aspects of de-single-centralization, security and reliability, and operational efficiency. If you want to deal with these three aspects at the same time, you need to spend a lot of human and material resources. Another important point is that blockchain technology is based on computer hardware and software technology, so the vulnerabilities of the hardware and software will certainly be constantly discovered, which will invite network hacking attacks for various purposes, which will bring certain pressure on the smooth operation of the entire blockchain network.

Finally, the change of system and interest pattern will to a certain extent hinder the landing of the application of blockchain technology in preventing financial fraud. As for listed companies, information transparency and completeness will compress the operation space of enterprises for financial statements, and the opening of all information data on the chain will affect the interests of listed companies themselves and incur their strong resistance.

5.2. Countermeasures

When it comes to the application of blockchain technology, it's essential for various sectors to engage in corresponding promotional and educational activities, and to eliminate those behaviors that are actually fraudulent under the cloak of new technology. Currently, the nation has already implemented this strategy, designating the development and utilization of blockchain technology as a novel infrastructure for strategic growth. Regarding the technical aspects, the future advancements in semiconductors, chips, storage, and other hardware will eventually resolve the efficiency issues of blockchain technology.

In response to the problem of excessive promotional costs, recalling the previous development of accounting from the era of manual bookkeeping to the current era of information interconnection and data-based operations, the development of blockchain technology also requires the necessary investment in capital and research and development personnel; now the country has also invested a variety of resources to deal with a variety of cyber-attacks, to protect the safe operation of the network.

Finally, we must recognize that the core of blockchain technology lies in sharing, growth, trust, and collaboration, which are the prevailing tendency and orientation for the future progression of IT and the construction of a connected society. As such, businesses should embrace these changes and actively ponder how to evolve their operations to suit the future developments influenced by novel technologies, thereby charting an innovative path.

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