Research on the Impact of Blockchain Technology on the Construction of Accounting Information Quality Evaluation System--Based on the Accounting Information Disclosure of "GEM listed Companies"

Lili Feng[a *], Ruijuan Wu[b] and Qian Wu[c]

Hebei GEO University,Shijiazhuang City, Hebei Province, China

[a]95362625@qq.com, [b]iluckyi@126.com, [c]1298713615@qq.com

[*]corresponding author

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Abstract: How to correctly and efficiently evaluate and identify the quality of accounting information has always been a hot topic of research and discussion among scholars. Blockchain technology is characterized by decentralization, trustlessness, tamper-resistance, strong traceability and intelligence. Therefore, discussing the application of blockchain technology in the accounting information quality evaluation system will have far-reaching significance in improving the feasibility of the system and strengthening the quality of accounting information in the future. Based on the characteristics of GEM listed companies, this paper firstly summarizes the results of the accounting information quality evaluation system, and finds out the accounting information quality of GEM listed companies at present. Secondly, the theoretical basis and characteristics of blockchain technology are described. Finally, from the perspective of accounting information distortion, this paper analyzes the impact of blockchain technology on the construction of accounting information quality evaluation system and the application challenges of blockchain technology.

1 Introduction

According to the Announcement of Accounting Information Quality Inspection (No. 39) issued by the Ministry of Finance in 2018,in the supervision and inspection of accounting information of enterprises and institutions by the Bureau of Finance, 5,787 enterprises and public institutions were punished, with 40.219 billion yuan investigated and dealt with, 863 million yuan of financial funds recovered, 562 million yuan of supplementary taxes paid and 27.7378 million yuan of fines collected [1]. It can be seen that there are still big problems in the quality of accounting information of enterprises in China, and the accuracy of the existing evaluation system of accounting information quality is not high.

The GEM listed companies have small assets, are in the early stage of development, and have the characteristics of high growth and high risk. With the rapid growth of GEM listed companies, the phenomenon of large-scale "cash out", high issue price and high overraised funds is gradually exposed, which makes the authenticity and reliability of accounting information disclosure questioned. Therefore, selecting the GEM listed companies as the main research object can more specifically discuss the problems existing in the accounting information quality evaluation system.The emergence of blockchain technology provides new solutions and approaches to the accounting information quality evaluation system. Based on the high integration of blockchain technology and accounting concept, this paper tries to apply blockchain technology to the accounting information quality evaluation system, and discusses the role of blockchain technology in improving the efficiency of accounting information quality evaluation system.

2 Summary of Accounting Information Quality Evaluation

The evaluation of accounting information quality must be based on the quality characteristics of accounting information [2]. From the perspective of accounting information users, the Financial Accounting Standards Board (FASB) proposes that the core objective of accounting information is decision-making usefulness, and establishes relevance, reliability, comparability and comprehensibility as the main quality characteristic system. According to China's accounting standards, accounting information quality includes reliability, relevance, intelligibility, comparability, substance over form, importance, prudence and timeliness. In the construction of accounting information quality evaluation system and the selection of indicators, reliability and relevance are the most important and core construction principles.

Many scholars have studied the reliability of accounting information and constructed the evaluation index of reliability from different angles. Wang Yucui and Kang Nannan (2010) took reliability as the basic requirement and measured reliability from six aspects, such as relevant indicators of cash flow of business activities and related parties [3]. Xu Guangwei (2013) constructed indicators from 13 aspects such as accounting information disclosure and audit report to measure the reliability of accounting information [4]. Most scholars construct correlation evaluation indicators from the following perspectives. Xu Hong and Xiao Nan (2012) measured the correlation of accounting information from three perspectives: asset quality, profit quality and cash guarantee quality [5]. Xu Guangwei (2013) evaluated the relevance of accounting information from five perspectives, including disclosure of financial analysis indicators and disclosure of company outlook forecast information [4]. In view of the characteristics of GEM listed companies, such as high growth, high creativity, high risk and high return. Lu Ming (2017) took reliability, relevance and compliance as the construction principles and selected indicators from five aspects to construct the accounting information quality evaluation index system of GEM listed companies [6].

3 Current Situation of GEM Accounting Information Quality

According to the information disclosure rating results of GEM listed companies by Shenzhen Stock Exchange from 2010 to 2018, the number of A-class listed companies accounted for between 13% and 22% of the total number of enterprises in each year, which showed A downward trend since 2015 and was only 14.61% as of 2018. Therefore, China's GEM listed companies are facing serious problems in information transparency. In addition, the White Paper on Information Quality of China's Capital Market and Information Transparency Index of Listed Companies released by Peking University in 2019 also pointed out that China's listed companies lack the motivation to improve information transparency, resulting in a low level of information transparency in the entire capital market.

At present, the accounting information reliability of listed companies on GEM is insufficient. All the accounting operations of enterprises are carried out on the basis of the original transaction information. But at present, the authenticity and reliability of original transaction information cannot be guaranteed, and some transactions such as bank bills, invoices and contracts are often falsified. The GEM listed companies have a lower threshold for listing. Although the growth potential is huge, it also has a high risk. If the authenticity of the original transaction information is in doubt, even if the subsequent accounting treatment is accurate, the accounting information disclosed is still not reliable. Secondly, the current external audit independence is weak. At present, in the audit business of the GEM, some firms may modify or conceal the problems of the GEM listed companies according to the requirements of the management in order to pursue economic interests, even if they find the problems in the audit process. Such behavior will inevitably lead to the low level of accounting information disclosure of the GEM listed companies.

4 Blockchain Technology

4.1 Theoretical Basis of Blockchain Technology

Blockchain technology is a chained data structure that bundles data into blocks and arranges

them in chronological order. As the underlying technology of Bitcoin operation and transaction, blockchain records and stores all metadata and transact-related data, automatically generates distributed electronic ledger, and guarantees the authenticity of data through cryptography and irreversible operation process. It is an invisible barrier for carrying and protecting Bitcoin data and information security. Essentially, blockchain technology is a distributed, shared database created through complex computer encryption algorithms.

4.2 Characteristics of Blockchain Technology

Decentralization.As the core advantage of blockchain, the decentralized feature of blockchain is the cornerstone of the application prospect of blockchain in multiple industries. Blockchain technology decentralizes the power of the control role, each subject is not only the participant of the platform, but also the supervisor of the platform. Each subject has the right to access and input the data and information in the blockchain. This kind of common and distributed accounting method greatly reduces the information asymmetry in the transaction process and eliminates the dependence and limitation of the traditional model on the central organization.

Detrust. Generally speaking, the infrastructure of blockchain is composed of data layer, network layer, consensus layer, incentive layer, contract layer and application layer, and each link guarantees the reliability of information [7]. Based on the operating mechanism disclosed by blockchain technology, all information recorded in each node of the distributed ledger can be recorded, querying and backed up to ensure the transparency and consistency of information. Blockchain technology establishes data in an open and transparent operation mechanism, and all participants of the platform will share and obtain all information equally, changing the previous spirit of contract and trust mechanism, realizing the trustable exchange of information value.

Traceability of transactions. Blockchain technology's peer-to-peer full participation mechanism can deepen the tracking of information sources to the source. Each block on the invisible chain is interlinked and time-stamped, which establishes a time dimension for the storage of information and records the sequence of transactions, showing strong traceability. However, traditional accounting is still highly dependent on accounting practitioners in the preservation and record of original vouchers, which has a weak traceability.

The tamper resistance. Blockchain technology enables enterprises to conduct transaction activities anytime and anywhere, simplifies the transaction link, and almost eliminates the distortion of information in traditional transactions. The asymmetric encryption technology of blockchain also ensures the security of information by encrypting data. Secondly, based on consensus algorithm of blockchain, if a host submits a request for change of information, it will be broadcast to all the hosts of the whole platform for verification and supervision. In addition, the system usually provides certain incentives to encourage participants in the platform to actively participate in the synthesis and verification of blockchain, so that the space for fraud is greatly reduced.

Intelligence. With the development of blockchain technology, smart contracts are born, and blockchain enters the 3.0 era. The smart contract of blockchain technology is like a vending machine, which automatically performs the agreed obligations of both parties through the pre-set trigger conditions for the execution of the contract, thus realizing the automation and intelligence of the transaction. At present, the work efficiency and the timeliness of accounting information transmission need to be improved. The automated transaction fulfillment process of blockchain will greatly save time and labor costs.

5 Application of Blockchain Technology

5.1 Blockchain Technology can Fully Improve the Reliability of Accounting Information

The reliability mainly depends on the authenticity, the approval and the neutrality of the three main components, the authenticity is the true reflection, requires the enterprise related to the financial position and operating results of the objective response; Neutrality is an important premise of authenticity, which means that accounting information should be impartial and free from

subjective elements. Auditability means that accounting information should be able to withstand review and verification.

Blockchain technology effectively guarantees the authenticity of accounting information. First of all, accounting information has been widely deepened, the work efficiency of the accounting industry has been greatly improved, but the distortion of financial information is still very serious. If the blockchain technology is combined with the accounting information system, it can effectively reduce the possibility of enterprise managers tampering and falsifying financial information. The timestamp mechanism of blockchain technology can not only guarantee the irreversibility of financial information, but also greatly liberate the audit, facilitate the traceability of the source of fraud, and realize the panoramic transparency and interconnection of financial information. The application of blockchain technology will significantly improve the transparency of enterprise accounting information and greatly enhance the authenticity of accounting information.

Blockchain technology can fully improve the verification of accounting information. Blockchain technology can confirm financial information as the six accounting elements according to double entry bookkeeping and accounting confirmation standards, and establish a verification mechanism to ensure the trial balance of accounting subjects according to the equation relationship between accounting elements [8]. The accounting trial mechanism of blockchain technology can record all transaction information during the whole transaction period, retain the original data permanently, and digitize all solidified offline transaction records from the beginning of generation. With the help of blockchain technology, any transaction on the platform can be investigated, which eliminates the incomplete accounting information caused by the chaos of financial management in the early stage of the establishment of GEM listed companies and ensures the orderly and comprehensive financial data of enterprises.

Blockchain technology effectively guarantees the neutrality of accounting information. First of all, third-party audit is an important means for enterprises and the government to maintain the neutrality of accounting information, but the possibility of violation of laws and regulations and falsification between audit and GEM listed companies still cannot be ignored. Secondly, in order to avoid the government taking some measures that are not conducive to the interests of enterprises, enterprises usually adopt accounting policies that defer profits or reduce earnings to reduce political costs. In the era of blockchain smart contracts, smart contracts with strong expansibility can theoretically make accounting transactions and accounting occur automatically, which can largely avoid people's subjective judgment behavior and artificial operability, and maintain the neutrality of accounting information.

5.2 Blockchain Technology can Fully Improve the Relevance of Accounting Information

Timeliness, comparability, importance and clarity are the four important indicators for the selection of relevant elements. Timeliness requires that the accounting subject should provide relevant information for the accounting information demander within the prescribed time,comparability refers to that the accounting information of an enterprise is comparable to its own previous information and the enterprises in the same industry,importance requires that the disclosure of accounting information should be emphasized according to the needs of information users, clarity requires that accounting information be concise and clear and does not affect the use of information demanders.

Blockchain technology effectively guarantees the timeliness of accounting information. Timeliness requires enterprises to confirm and measure the economic business and matters in a timely manner, and deliver the processed accounting information to ensure the timeliness and effectiveness of the application of information demanders. From the perspective of GEM listed companies, blockchain distributed ledger technology has a collaborative sharing platform processing mechanism, which can realize the real-time collection, upload and release of financial information and transaction content, improve the processing speed of information flow through unified platform processing, reduce the time of adjusting accounts, and save time and cost.

Blockchain technology effectively improves the comparability of accounting information. The

accounting measurement, confirmation and accounting time of listed companies on GEM are inconsistent, and the content and form of information disclosure are different, leading to the inability of information users to make correct comparative analysis and prediction on the financial status, operating results and future prospects of different companies. The consensus mechanism of the blockchain ensures that the ledger data on all nodes is consistent. The accounting measurement, confirmation and accounting of enterprises have become more systematic and standardized. The accounting information produced is arranged and manufactured by the production line of blockchain. The highly consistent accounting information in all aspects ensures the strong comparability.

Blockchain technology effectively guarantees the importance of accounting information and improves its clarity. The importance of accounting information is mainly reflected in the measurement, accounting and financial reporting of accounting information, focusing on the primary and secondary accounting information. Clarity focuses on the simplicity and clarity of accounting information. Under the traditional accounting practice, companies listed on the GEM can disclose relevant information according to their own needs in order to expand their influence and show their profitability to attract foreign capital, which makes investors' doubts about the authenticity of enterprise accounting information impossible to eliminate. And the programmatic design of the blockchain accounting information system can standardize the accounting processing procedures of enterprises, so that the business conditions of enterprises can be true and clear disclosure, major accounting treatment can also be clearly marked.

6 Blockchain Application Challenges

6.1 High Implementation Cost

Blockchain technology platform is based on computer network, and the laying of infrastructure needs a lot of capital and policy support. If blockchain used in accounting industry, enterprises need according to their specific situation to make corresponding code suitable for this enterprise, set up the corresponding intelligent contract, its subsequent need technical personnel according to the problems encountered in the process of practical application to improve or recode, it is faced with high labor costs. Thus it can be seen that the construction of a new infrastructure and operation mode of blockchain technology requires a large amount of human and economic costs.

6.2 Less Professional Talents

Compared with other countries, China's research and attention on blockchain started late. At present, the number of personnel training for blockchain technology in relevant universities is relatively small. China lacks some professional talents proficient in accounting and blockchain technology, and the blockchain technology is still in the research stage. In addition, after the application of blockchain technology, it will also bring new learning and challenges to accounting practitioners. The country and enterprises need to cultivate new high-end composite talents to ensure the stable operation of the application of blockchain technology.

6.3 Relevant Legal Gaps

Blockchain technology is still in beginning and exploring stage, there is no relevant laws and regulations of restriction and protection to blockchain technology. To realize blockchain technology widely used in the accounting information quality evaluation system, not only needs the joint efforts of the theoretical and practical circles, but also needs the strong support and affirmation of the relevant government departments and the business circles. Only in this way can the blockchain technology be truly applied to the accounting information quality evaluation system, making the system more efficient, more accurate and more transparent, so as to better serve the economic development.

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