

Research on the Application and Practice of Blockchain Technology in Supply Chain Monetary Arrangements Business of Commercial Banks

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Abstract: In the current environment of globalization and industrial transformation, modern supply chain finance plays an increasingly important and critical role. Through the combination of multiple resources, supply chain finance helps to improve the competitiveness of the main body of the supply chain, improve the efficiency of the overall capital operation of the supply chain, and correspondingly reduce the overall operation and management costs. At the same time, supply chain finance connects the industrial supply chain and various financial activities, and has become an important strategic way to solve the problems of financial service entities, especially to solve the financing difficulties and expensive problems of small and medium-sized enterprises for a long time. With the intensification of competition and the increasingly obvious differentiation of the advantages and disadvantages of the main body of the industrial chain, supply chain finance plays an increasingly important role in solving the credit transmission, solving the financing of small and medium-sized enterprises, and optimizing the allocation of industrial resources. In recent years, China has been formulating relevant policies to encourage the rapid and healthy development of supply chain monetary arrangements industry. However, in the process of relying on traditional technology and business model to carry out supply chain finance business, there are always some problems that have not been well solved.

1. Introduction

There are some unavoidable problems in traditional supply chain finance, including low transparency of information, low efficiency of operation, and difficulty in risk control. In contrast, blockchain technology, with its characteristics of decentralization, data immutability and distributed ledger, has had a major impact on supply chain finance and brought revolutionary changes. On the basis of the fully decentralized public chain, the alliance chain and the private chain have been gradually derived, that is, the licensing chain. Permit-chain refers to a controlled form of participation that requires approval to join and exit the blockchain, enabling industry applications

that meet realistic regulatory conditions. Applying blockchain to supply chain finance, building an application-level and technologically innovative supply chain financial service system with blockchain as the bottom layer can combine scenarios with application solutions such as multi-center collective data maintenance, smart contract docking and settlement, and core enterprises' participation in credit transmission to effectively solve the problems of supply chain information asymmetry, data tampering, and low performance efficiency.

2. Overview of Blockchain and Supply Chain Finance

2.1. Introduction to Blockchain Technology

At present, the world has not yet unified the definition of blockchain technology standards. According to the "Blockchain Reference Architecture" issued by the China Blockchain Technology and Industry Development Forum, blockchain is defined as a mode of building unforgeable, untampered and traceable block chain data structures in a peer-to-peer network environment through transparent and trusted rules to achieve and manage transaction processing. According to this definition, in a narrow sense, blockchain is a chain data structure composed of data blocks in chronological order, connected in the previous and later order, and an unforgeable and untampered distributed ledger achieved by cryptography. Broadly speaking, blockchain technology uses the consensus algorithm of distributed nodes to generate and update data, uses the block chain data structure to verify and store data information, which is a new distributed infrastructure and computing paradigm.

In the financial field, blockchain technology is primarily applied to improve transaction efficiency, reduce transaction costs, enhance data security, and credibility. Through blockchain technology, financial institutions can build more efficient, transparent, and secure transaction systems, providing customers with better services.

2.2. Introduction to Supply Chain Finance

Supplier Financing Solutions is a fiscal service paradigm that oversees the flux of capital and merchandise for upstream and downstream small and medium-sized businesses centered around pivotal enterprises. It converts the unmanaged hazards of solitary ventures into manageable risks for the entire distribution network, and acquires diverse data in three dimensions to minimize exposures in fiscal services. This financial service model takes core enterprises as the starting point to provide financial support for the supply chain. On the one hand, it effectively injects funds into upstream and downstream supporting small and medium-sized enterprises in a relatively weak position, solving the problems of financing difficulty for small and medium-sized enterprises and the imbalance of the supply chain; on the other hand, it integrates bank credit into the purchase and sale behavior of upstream and downstream enterprises, enhances their commercial credit, promotes the establishment of long-term strategic synergy between small and medium-sized enterprises and core enterprises, and enhances the competitiveness of the supply chain.

3. Commercial Bank's Current Status in Supply Chain Finance

3.1. Current Business Status and Challenges

With the globalization and networking of the economy, supply chain finance, as an important business of commercial banks, has gradually become a financial link connecting upstream and downstream enterprises in the industrial chain. By providing comprehensive services such as

financing, settlement, and risk management, commercial banks effectively promote the smooth operation of the supply chain. Currently, the main models of Supply Chain Financing Operations of commercial banks include accounts receivable financing, prepayment financing, and inventory financing, etc [1]. The characteristics of the business are mainly reflected in the following aspects: firstly, it is based on the real trade background to ensure the unity of fund flow, logistics, and information flow; secondly, it focuses on the overall credit of the supply chain rather than the credit of a single enterprise; thirdly, it achieves online and automated operation processes through the application of financial technology.

Although supply chain monetary arrangements business models continue to innovate, commercial banks still face many problems and challenges in practical operations. On the one hand, the problem of information asymmetry is serious. Due to the involvement of multiple entities in the supply chain, information is dispersed and difficult to integrate, making it difficult for banks to fully grasp the true situation of the supply chain. At the same time, credit risks still exist. Some small and medium-sized enterprises may engage in fictitious trade backgrounds, forge documents, etc., which increase the bank's risk exposure. On the other hand, operational risks cannot be ignored. Complex business processes and human operational errors may cause losses to banks.

3.2. Limitations of the Traditional Model

Despite the fact that the conventional supply chain finance business has, to some degree, eased the financial constraints faced by small and medium-sized enterprises, its restrictions are becoming increasingly evident. Within the traditional supply chain finance framework, data is frequently scattered across multiple connections and entities, with inadequate systems for efficient information exchange and consolidation [2]. This leads to serious information silos, and banks find it difficult to obtain comprehensive supply chain information, thereby affecting the accuracy of risk assessment and the efficiency of financing decisions. Due to information asymmetry and the complexity of credit risk assessment, traditional supply chain finance business often accompanies cumbersome audit processes and long waiting periods. This not only reduces financing efficiency but also increases the financing costs of small and medium-sized enterprises. Meanwhile, in order to control risks, banks usually require enterprises to provide additional collateral or guarantee measures, further raising the financing threshold and costs for enterprises.

4. Blockchain Applications in Supply Chain Finance

The impact of blockchain technology on commercial bank's supply chain finance business is comprehensive. It not only optimizes business processes and improves efficiency but also plays an important role in risk management. As technology continually advances and application scenarios broaden, blockchain technology is destined to play an increasingly significant role in shaping the future landscape of supply chain finance [3].

4.1. Analysis of Specific Application Cases

In recent years, the traditional L/C business is mostly delivered in paper form after issuing L/C, and there is a lack of trusted electronic channels for L/C modification, receipt, notification and other links. In this case, there is a risk of information tampering, and processing takes a long time and is inefficient. At present, domestic interbank letter of credit mainly uses SwiftMT799, MT999 or the second generation payment message mode, but MT799 and MT999 do not support Chinese form, and the second generation payment message is short and difficult to meet the requirements. The use of blockchain technology can establish an alliance chain connecting multiple buyer and seller banks,

achieve a true sense of electronic credit opening mode, achieve "information seconds", and completely change the traditional transmission method of mail letter opening domestic letter of credit. The system is based on the underlying technology of the hyperledger fabric alliance chain, which is jointly operated by China Citic Bank, Minsheng Bank and Suning Bank. The system realizes the functions of strict compliance, second-level opening, independent of third parties, full encryption of domestic L/C online opening, notification, presentation, arrival, acceptance, payment, closing and so on.

Based on the immutable characteristics of blockchain, it can effectively solve the problem of information authenticity, greatly reduce processing costs and reduce operational risks. In addition, by using the traceability characteristics of blockchain, banks of buyers and sellers can monitor and track the whole process information of domestic letter of credit opening, notification and presentation in real time, ensuring that the information of all parties is transparent and controllable. For example, China Citic Bank and Minsheng Bank jointly launched the blockchain-based Domestic Letter of Credit Information Transmission System (BCLC). The system connects banks into a network, realizing the electronic opening of domestic L/C instead of the traditional paper L/C opening, making the process of issuing L/C, notification, presentation, acceptance, payment and so on more transparent and traceable.

4.2. Impact on Business and Risk Management

The widespread utilization of blockchain technology in the supply chain finance operations of commercial banks has significantly influenced the refinement and restructuring of business processes, as well as the enhancement and advancement of risk management. On the one hand, blockchain technology breaks the information island problem in traditional supply chain finance by realizing data sharing and collaboration, and improves the overall efficiency of the business. At the same time, technological means such as smart contracts enable automated business processes, reducing the possibility of human intervention and error. On the other hand, blockchain technology provides more comprehensive and accurate data support for commercial banks. By monitoring and analyzing the data of all links of the supply chain in real time, banks can more accurately evaluate the credit status and risk level of financing enterprises. The immutability of its technology ensures the authenticity and reliability of the data, and provides strong technical support for the risk management of banks.

5. Investigation into the Implementation of Supply Chain Finance in Commercial Banks Utilizing Blockchain Technology

5.1. Case Study Analysis

In the specific practice of blockchain technology in supply chain finance business, we choose Zheshang Bank as a representative case for in-depth study. Zhejiang Commercial Bank has built a supply chain finance platform based on blockchain technology, realizing transparent monitoring of the entire supply chain process and ensuring the tamper-proof nature of data. The platform utilizes the decentralized, data sharing, and security features of blockchain to ensure the authenticity and credibility of transaction data. Through this platform, small and medium-sized enterprises can obtain financing support more quickly, reducing the threshold and cost of financing, and providing banks with more accurate risk assessment basis.

In practical applications, Zhejiang Commercial Bank has cooperated with core enterprises to automate the financing and settlement process through technologies such as smart contracts. This has not only greatly improved the efficiency of business processing but also enhanced customer

satisfaction. Furthermore, Zhejiang Commercial Bank has utilized blockchain technology to optimize the process of supply chain finance, reducing cumbersome manual operations and improving work efficiency.

5.2. Evaluation of Practical Effects and Continuous Improvement Suggestions

For the practical effects of Zhejiang Commercial Bank's supply chain finance based on blockchain technology, we have conducted quantitative and qualitative evaluations [4]. From a quantitative perspective, by comparing business data before and after the application of blockchain technology, we found that the efficiency of financing has been significantly improved, the financing time has been greatly reduced, and the non-performing loan ratio has also decreased. From a qualitative perspective, customer satisfaction with the business has significantly increased, and the cooperation relationship between the bank and enterprises has become closer.

To address the problems and challenges encountered in practice, we propose the following improvement suggestions: on the one hand, banks should continue to increase investment in the research and development of blockchain technology, continuously optimize and improve the functionality and performance of supply chain monetary arrangements platform. On the other hand, strengthen cooperation with governments, industry associations, and other institutions to promote the standardization and regularization of blockchain technology in the field of supply chain finance. Finally, pay attention to talent training and team building, enhance employees' understanding and application capabilities of blockchain technology.

6. Conclusion

This study makes a thorough and detailed analysis of the application of blockchain technology in supply chain monetary arrangements business of commercial banks, and draws the following important conclusions. We have found that blockchain technology has achieved impressive results in increasing the transparency and efficiency of supply chain finance operations. Specifically, by enabling the sharing and collaboration of data, as well as ensuring the authenticity and immutability of data, blockchain technology significantly improves the speed of business processing, while also significantly reducing operational risks. The application of this technology provides a more convenient and safe financing channel for small and medium-sized enterprises, and effectively enhances the risk management ability of commercial banks. It is worth mentioning that blockchain technology, with its unique characteristics, has successfully broken the information barriers existing in traditional supply chain finance. This gives banks access to more accurate data to support their credit decisions. In this way, blockchain technology not only helps banks make more intelligent and reasonable credit decisions, but also effectively reduces financing costs, improves overall business efficiency, and brings greater economic benefits to banks.

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