Research on the Application of Block Chain in Supply Chain Finance

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ABSTRACT

With the hot of government "Internet +" and eight ministries "on the financial support for industrial growth and stability of the transfer of a number of views of the increase in efficiency," Supply chain finance has entered a stage of rapid development. The blockchain technology as a supply chain finance development of fuel, can be described as the role of vital. This paper first analyzes the characteristics of supply chain finance, and then elaborates the research and application of blockchain technology in supply chain finance in recent years. Thirdly, this paper lists the supply chain financing and the supply chain logistics, Finally, the application of blockchain technology in supply chain finance is summarized and forecasted.

KEYWORDS

Blockchain, Supply-chain Finance, Supply Chain Logistics

INTRODUCTION

With the hot of government "Internet +" and eight ministries "on the financial support for industrial growth and stability of the transfer of a number of views of the increase in efficiency," Supply chain finance has entered a stage of rapid development. The blockchain technology as a supply chain finance development of fuel, can be described as the role of vital. This paper first analyzes the characteristics of supply chain finance, and then elaborates the research and application of blockchain technology in supply chain finance in recent years. Thirdly, this paper lists the supply chain financing and the supply chain logistics, Finally, the application of blockchain technology in supply chain finance is summarized and forecasted.
support for industrial growth and stability of the transfer of a number of views of the increase in efficiency," Supply chain finance has entered a stage of rapid development[1]. The blockchain technology as a supply chain finance development of fuel, plays an important role. Supply chain finance is a comprehensive financial service based on supply chain internal transactions, key nodes are risk nodes, and provides closed credit, settlement and financial management for these nodes. Its essence through the control of key node risks to help enterprises to revitalize their current assets to solve the financing problem. It can be seen that "Risk management" is the key point of the whole supply chain finance and needs to be realized by obtaining real and reliable supply chain information flow in time. However, in the process of supply chain operation, all kinds of information scattered and stored. The supplier's cargo information stored in the supplier's storage information, shipping information in the hands of logistics companies, capital information distributed in the banking system, all information is grasped by the chain key. It is difficult to understand the progress of the transaction, the asymmetric information affects the efficiency of the whole chain, and finally leads to the whole supply chain credit system is difficult to establish. The supply chain information is not transparent and not smooth. The financial services provided for the supply chain trade background are also difficult to carry out because of the asymmetry of information.

In the supply chain, integration the core nodes and upstream and downstream nodes of the information, logistics, capital flow is essential. But the current enterprises maintain their own data information, information silos appeared that increases the difficulty of information integration. The blockchain technology make each party join a network as one of nodes, the enterprise's assets and products will be digitized in the network, the transaction between any node will be determined by the whole network, logistics information can also be through Product location changes in the information reflected in the network, opened up the information channel of entire chain. At the same time, the blockchain technology comes with the timestamp [2], alleviate the problem of information asymmetry, fundamentally solve the problem of authenticity of trade background. Suppliers, core companies, distributors, logistics companies, warehousing regulators, financial institutions and other participants, can use blockchain technology to form and share their various links in the supply chain in the various transactions -- each the formation of network nodes information be broadcasted in the whole network. Logistics information through the location of the goods changes in the information is reflected in the network. The information through the payment of information to update the timely notification of the recipient and financial institutions. Accounts receivable information and payable information through the time of the funds mismatch information timely and accurate updates to the parties to the transaction and financial institutions, warehousing regulatory information through digital information provided to enterprises in a timely manner and to provide chattel mortgage financing financial institutions.
Blockchain technology makes the supply chain each party from the source to obtain first-hand real and effective data, completely solve the problem of information on all aspects of the island, to build a new and reliable supply chain credit system, thus solving the supply chain finance Credit risk in service. This paper chooses two large scenarios of supply chain finance and supply chain logistics, and gives the solution of blockchain technology in two scenarios. Finally, the application of blockchain technology in supply chain finance is summarized.

RESEARCH STATUS OF THE BLOCKCHAIN TECHNOLOGY APPLICATION IN SUPPLY CHAIN FINANCE

In early 2016, Wal-Mart, IBM and Tsinghua University in Beijing jointly created a chain based Pork Industry Supply Chain Project in china. This project is a part of Chinese government and Wal-Mart to make more accurate and safe and make the supply chain data of two independent and parallel measures. Blockchain technology applied to China pork industry supply chain, to ensure that the pork production details, batch number, plant and processing data, expiration date, storage and transportation temperature accuracy the details of the traceability, tamper resistance. In June 2016, Fluent co-founder Lamar Wilson and Lafe Taylor recently announced a block chain based financial operations network Fluent. It can simplify the financial supply chain[3,4]. In August 2016, the Bank of America, HSBC and the Singapore government set up a block chain supply chain project based on super book agreement. In March 2017, the North American block chain association NABA and Technology Finance International Summit organizing committee jointly launched the global block chain supply chain alliance SLEAGUE, and created the global supply chain block chain laboratory SLABS. In March 2017, the dot com and Foxconn jointly launched the first blockchain supply chain financial platform Chained Finance, with the aid of block chain technology to solve the problems of supply chain finance and SME financing.

APPLICATION OF BLOCKCHAIN TECHNOLOGY IN SUPPLY CHAIN FINANCE

Supply Chain Finance is the use of financing and risk mitigation measures and technology, to optimize the working capital and liquidity management which were put into the supply chain processes and transactions. Supply chain finance is usually used for credit sales, triggered by supply chain events. Simply, supply chain finance is a financing model in which banks connect core businesses with upstream and downstream businesses to provide flexible use of financial products and services.
Supply chain finance has gone through three stages of development: 1.0 stage is mainly around the core business credit service upstream and downstream enterprises, manual approval of a matter; 2.0 stage mainly around the core enterprises to bank-enterprise direct as the core to achieve batch The supply chain finance 3.0 stage is based on the platform as the core[5,6], integration of business, logistics, information, capital flow "four streams together".

In a supply chain, the core business is the central node, the supplier is the parent node, the distributor is the child node. Upstream suppliers sell credit to core businesses, generate accounts receivable, and downstream distributors often need cash and equivalents to purchase from core businesses. Therefore, the main current assets of enterprises, including cash and equivalents, accounts receivable and inventory of the three categories, and these three types also determines the supply chain finance of the three models: receivable financing, prepaid financing, inventory financing[7].

1) Receivable financing

Suppliers rely on the core business transactions arising from the contract, orders, accounts receivable and other credit or assets to obtain the supply chain financing services. Typical products include accounts receivable transfer (factoring), receivables pledge financing and so on.

2) Prepaid financing

Prepaid financing usually refers to credit, prepaid and supply chain inventory through the core business-related support, access to financial institutions to support the financing of funds. Typical products include order financing, channel dealer financing, Vancouver and so on.

3) Inventory financing

In the supply chain business, the circulation of goods, especially the warehousing, futures and borrowers generated by the mass trade flows, obtains the demand for short-term liquidity, or the demand for short-term liquidity through the corresponding warehouse receipts for pledged goods or valid futures, or the financing model used to meet the requirements for the delivery of standard warehouse receipts. Typical products include chattel pledge financing, warehouse receipt pledge financing and so on.

Based on the blockchain technology, to establish a supply chain to participate in all parties to share information on the alliance platform to serve all aspects of supply chain finance. Use of blockchain information sharing, data can not be tampered with, the process can be traced back to the characteristics to ensure the supply chain financing process is transparent, flexible, low cost, high reliability. Platform structure shown in Figure 1.
1) Achieve four streams together

Business data logistics, information flow, capital flow and other data will be integrated on the chain by using of blockchain technology, to achieve four streams together, to ensure data security at the same time to achieve transparent visualization of data services. Financial institutions to reduce operating costs and improve decision-making efficiency; buyers and sellers to better grasp the logistics information tracking, and through intelligent contract technology to reduce the risk of counterparties.

2) Expand the service object

Banks and other traditional institutions use the core business credit to carry out the supply chain financial business, cannot cover many small and medium enterprises. In addition to the core business with the co-ordination, the financial services only cover the core business of a supplier or a dealer, two or more suppliers and distributors and the core business without direct procurement or sales contracts, it can’t provide financing facilities. Fully use the blockchain technology that is easy to segment, traceable, not tampering with the characteristics [8], the core business in the blockchain issued a digital payment commitment to a supplier. A supplier can spin off the commitment and part transferred to the secondary supplier according to settlement needs. And so on, you can benefit the core business upstream N-level small and medium-sized suppliers.

3) Strengthen risk management

Verify the authenticity of the underlying transaction: supply chain financial services is based on basic trade and provide financial services. The use of blockchain consensus mechanism advantages, multi-party cross validation, to ensure business authenticity, to prevent fraud risk. At the same time, play blockchain technology traceability characteristics, so that receivables (single pen) financing and basic business one by one correspondence, closed operation.

4) Accounts receivable

The traditional business process is complex, long hours, affecting the borrower's application experience. The digital assets issued based on the
blockchain make account receivable equity digitalize, the creditor expresses the true meaning by encryption, avoiding the "double". It was applied to accounts receivable rights division, transfer, ownership, improve accounts receivable liquidity, optimize business processes and customer experience.

5）Pledge and its price management

The Internet of things technology is used for tracking supervision of the collateral, monitoring the price of the goods through the intelligent contract, and setting up automatic disposal measures to prevent operational risks and market risks.

6）Fund flow management

Use of multi-party signature and smart contract technology to strengthen the flow of funds to control and back to control, to strengthen the flow of funds closed loop management.

APPLICATION OF BLOCKCHAIN TECHNOLOGY IN SUPPLY CHAIN LOGISTICS

Supply Chain Logistics Management is a logistics management system centered on supply chain core products or core business [9]. The core product logistics management mainly refers to the supply chain logistics management. Such as the manufacture and sale of high / low pressure equipment, the supply and raw material supply. The core business logistics management is based on the core business of logistics system and organized the logistics supply chain management, such as logistics enterprise logistics management.

Logistics process is a process of material flow, but also a process of value flow and information data, throughout the entire supply chain links, is the link between enterprises. Supply chain logistics management is in the organization of logistics activities, we should fully consider the characteristics of the supply chain, emphasizing coordination.

Supply chain logistics is logistics activities as the core, coordination of production and purchase in supply areas, sales of customer service and order processing, as well as financial inventory control activities, involving procurement, outsourcing, transformation and all the logistics management activities. How to build a logistics, information flow, value stream "three streams" of the system to promote the supply chain logistics participants to coordinate the operation, Enhance the trust of business activities, that is the supply chain logistics future direction of development.

Blockchain technology is a distributed database technology, its asymmetric encryption, to trust, not tampering and consensus mechanism and other characteristics, can achieve logistics, information flow, value stream "three streams". It can ensure that information is shared while protecting trade secrets, enhance the coordination and trust of the participants in the supply chain logistics
system, and improve the efficiency of the supply chain logistics. As shown in Figure 2, the blockchain technology is applied to every aspect of the supply chain logistics to synchronize the purchase logistics, production logistics and sales logistics of the product into the blockchain network.

In general, supply chain logistics can be divided into three phases: the purchasing phase, the manufacturing stage and the sales phase. In these three phases, the corresponding data records include:

(1) **Procurement Stage**

Raw material suppliers need to provide proof of production information for these raw materials, such as the manufacturer's annual production information for the raw material, the details of the raw materials, and the labels used to help identify some of the characteristics of the material. These parameters can be used for different types of raw materials adjustment. Raw materials as the source of the product, its authenticity is particularly important. These raw material information needs to be registered to the blockchain, if the information length is too large, only its digital fingerprint recorded in the blockchain.

(2) **Manufacturing Stage**

The manufacturing or processing plant uses raw materials as input and outputs the product. The process is similar to the procurement process, but there are strict restrictions on the input conditions. The input must be the output of the procurement phase. If the product requires a variety of raw materials, then each of the raw materials as its input.
(3) Sales Stage

For each product to generate a unique label, you can use two-dimensional code or NFC, RFID tags in the form of link to the product raw materials, ingredients or product itself, the blockchain to prove. Consumers get the product, through the scan label can be automatically linked to its source information and the whole process of circulation.

Supply chain logistics participants build an alliance chain based on the blockchain technology, form an ecological circle. In this alliance chain, the parties can share a transparent and reliable information platform, trace the product procurement, manufacturing and circulation of the entire process. At the same time, the participants can also carry out other types of services based on the blockchain data, such as precision marketing, supply chain finance and so on.

CONCLUSIONS

Supply chain finance can help small enterprises in the supply chain to solve the problem of financing difficult. With the expansion of the scope of financing, distributors of sales capacity has greatly improved, the core business of the supply and marketing channels have also been stable. The blockchain has been joining, enhance the suppliers, distributors, core enterprises, logistics, information flow, value stream sharing capabilities, promote the advantages of supply chain finance to further enlarge, and improve the entire supply Utilization and Coordination Efficiency of Chains in Chain. However, the application of blockchain technology in supply chain finance is still in the early stage of development. Although some projects have bold application of blockchain technology, it is still in the stage of exploration. Some experts speculate that blockchain technology can really mature application to supply chain finance also takes many years. At present, the blockchain exists relatively slow calculation speed, storage space is small, and not all data processing need to use the blockchain. Despite the development of blockchain is bumpy, but the power of blockchain technological innovation will break the inherent pattern of finance, disruptive innovation will bring about leaps and bounds, providing a boost to supply chain finance.

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REFERENCES