

Discussion on the Innovative Application Mode of Cross-border Payment in China

-- Using Blockchain Technology as A Concept

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Abstract: Cross-border payment has built a bridge for trade and financial circulation among countries. Traditional cross-border payment methods have problems of low efficiency, high cost and poor security. Blockchain technology has the characteristics of decentralization, tamperability, security and credibility. The Ripple model built on the basis of blockchain technology can better solve the problems of traditional models. However, there are also some technical, legal and financial risks in cross-border payment under the new model. In order to promote the development of cross-border payment based on blockchain technology, we should strengthen the research on blockchain technology and improve the blockchain industry standards and supervision regulations.

Keywords: SWIFT Model, Blockchain technology, Cross-border payment, RIPPLE model.

1. Introduction

1.1. China's traditional cross-border payment means

Cross-border payment refers to the international bond debt between two or more countries or regions due to international trade, international investment and other aspects, which requires the use of certain settlement tools and payment systems to realize the cross-border and cross-regional transfer of funds.

At present, China's cross-border payment mainly uses four forms of payment. The first form of payment is bank telegraphic transfer, which is the earliest form of payment in China, and also the most common and safe form of payment in China. [1]Bank telegraphic transfer means the telegraphic transfer method by which a bank entrusts a commission bank to provide loans to specific payees and payees by telegraph, fax or SWIFT. This method of remittance is slow and its transaction cost is high.

The second form of payment is professional remittance company. In cross-border payment, many financial institutions have multiple agency points around the world, including post offices and banks, to facilitate cross-border payment activities. Professional remittance companies rely on the agency points of these institutions to provide services for the subject of collection and payment. The payee can pay for the letter of credit in these agency points by virtue of identity certificate, that is, the written document that the bank pays to the beneficiary or its designated party according to the requirements and instructions of the applicant or on its own initiative, on the condition that the terms of the letter of credit are met. Banks use letters of credit to realize cross-border payment between trade parties. Although the use of this method has greatly guaranteed the beneficiary's collection, its procedures are complex and there are many links, which are not only time-consuming, but also costly, increasing the cost of cross-border business.

The fourth form of payment is third-party payment. The

role of the third party payment institution is the credit institution. When making payment in this way, the buyer will pay the payment to the third party institution after purchasing the goods. The third party institution requires the seller to deliver the goods after receiving the payment. When the buyer completes the process of harvesting and inspection, the third party will pay the payment to the seller. In this way, the buyer can obtain the change of exchange rate in real time, which has the advantage of convenient and fast payment, but at the same time, there are many hidden dangers of information security.

1.2. Basic principles of blockchain operation

Blockchain, by definition, is a chain of blocks. Each block contains a certain amount of information, which is connected into a chain according to the time sequence of their generation. This chain is stored in all servers. As long as one server in the whole system can work, the whole blockchain is safe. These servers are called nodes in the blockchain system. They provide storage space and computing power support for the entire blockchain system. If you want to modify the information in the blockchain, you must obtain the consent of more than half of the nodes and modify the information in all nodes, which are usually in the hands of different subjects, so it is extremely difficult to tamper with the information in the blockchain.

2. Practical Application of Traditional Cross-border Payment

2.1. Introduction to SWIFT model

The function of the SWIFT system is to provide a mechanism for the international payment of the trading parties in different countries. As in figure 1, it is mainly composed of two bank core systems and SWIFT system. First of all, the payer sends an international order to the payee. After receiving the order, the payee issues the shipping order and ships it for transportation. At the same time, the payer submits a remittance application to the deposit bank A. If the

payer and the payee are in the same country, the payment instructions will be sent to the payee's bank through the SWIFT system, and the payee's bank will credit the account for the payee, and then the payee will be notified to pay through the payment notice or the domestic payment system.

If the payer and the payee are in different countries, the payer's deposit bank sends the SWIFT payment message to the transfer bank, and then the transfer bank forwards the message to the payee's bank, so as to continue the above operations.

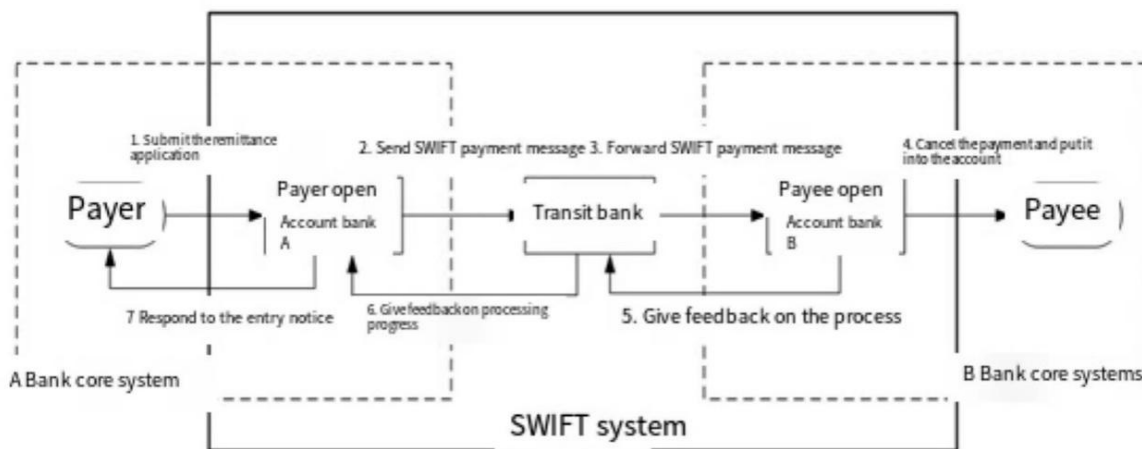


Figure 1. SWIFT model flow

2.2. Use SWIFT model to analyze cross-border payment

Although the traditional cross-border payment mode using SWIFT model is the most common cross-border payment mode in China, there are still three main problems.

2.2.1. Safety issues

First, the most prominent issue is security. In the process of cross-border payment, information usually passes through more nodes, so it is easy to lose information. At the same time, because cross-border e-commerce transactions are carried out on the Internet, a series of security problems caused by the characteristics of the Internet are unavoidable, such as being invaded by hackers and other illegal elements into the banking system and stealing personal data. In 2016, hackers invaded the Alliance Access software of SWIFT, resulting in the theft of US \$81 million from the account of the Central Bank of Bangladesh and flowing into the casino, which shows that it has great security risks.

2.2.2. Efficiency

In the traditional cross-border payment mode, because there are many transaction objects involved, it will take a lot of energy to pass through these transaction subjects. Generally, the arrival of cross-border transactions takes 3 to 5 days, with a minimum of 24 hours. [2] This is because daily settlement and a large number of new businesses need to be checked in the banking system every day. Moreover, this kind of work is generally manual, which takes a lot of time and can not guarantee 100% accuracy. Cross-border transactions require not only the remittance between banks, but also the participation of domestic remittance banks, cross-border clearing banks, foreign payee banks, and even agent banks. Multi-level agents have a lot of information delays and user credit risks, which will increase the transaction time. The most immediate consequence is the slow flow of funds, which leads to a decline in the efficiency of the use of funds.

2.2.3. Transaction costs

The last point is the transaction cost. Due to the process of the SWIFT system itself, every bank has to set up an account

at the correspondent bank, so it needs to prepare a large amount of funds for cross-border payment, which will cause a large liquidity loss. Generally speaking, the costs in traditional cross-border payment mainly include handling costs, financial operation costs, exchange costs and transaction reconciliation costs. According to McKinsey's prediction, the locking of liquidity accounts for 34% of the cross-border payment cost. According to the actual transaction process, the general domestic inter-bank settlement costs vary from US \$2-5. On average, if each cross-border transaction is completed through cross-border payment by the agent bank, the cost is about \$20-32, which causes a large amount of capital loss.

3. Model Analysis of Cross-border Payment Based on Blockchain Technology

3.1. Use Ripple model to analyze the advantages of blockchain technology in cross-border payment

3.1.1. Introduction to Ripple model

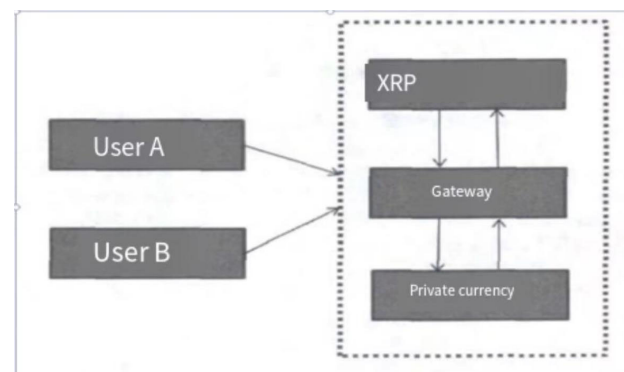


Figure 2. Ripple model flow

Ripple is the first open payment network in the world, through which you can transfer any currency. As in figure 2,

Ripple system can be implemented in two modes. The first way is to trade through the Swiss currency: First, after receiving the order, user A converts any kind of currency or virtual currency he holds into the Swiss currency, and then sends it to any user B in any region. After receiving the Swiss currency, user B can convert the fund into any other currency he needs, which completes a transaction. The other mode is through "gateway". The gateway is the import and export of funds into and out of the Rayleigh wave system. It is similar to an intermediary through which users can inject or withdraw different types of currencies into the Rayleigh system. Through the "gateway" intermediary, no matter whether users are familiar with each other or not, as long as they trust the same gateway together, the transaction can proceed smoothly. [3]"Gateway" is usually served by large banks or financial institutions. The process of this mode is: user A deposits the funds in the gateway that is trusted by user B, and transfers the funds to user B through the gateway. In addition, the Ripple system allows users to issue "private currency" within the system. If a certain Ripple user A has a good reputation, A Kai can exchange his own "private currency" with another user B who trusts him and is willing to accept it into other currencies such as US dollars or Bitcoin; User B can redeem the currency exchanged to Party A as needed. This process is actually a borrowing process. User A has the financing right to borrow from others.

3.1.2. Feasibility of application of blockchain technology in payment field

First of all, from the characteristics of the blockchain itself, the most important is its decentralized characteristics, which is the most essential difference between the blockchain and the traditional network. Decentralization means that in the network composed of blockchain, there is no centralized hardware or management organization like the traditional network. The rights and obligations of any node are equal, and the direct information transmission from point to point can be directly realized, and the damage or loss of any node will not affect the operation of the entire system. Due to the existence of consensus mechanism in the blockchain, if a certain information is tampered with in the blockchain, at least 51% of the blocks need to be tampered with successfully. It is unrealistic for hackers to break through this mechanism in terms of time, manpower and material resources. In addition, in the blockchain, users only pay the transaction amount as agreed, and no longer provide personal account information. Therefore, all accounts on the chain are completely secret. Even if hackers break the encrypted content of the blockchain, they cannot determine the template for their next invasion. The blockchain also has the characteristics of tamper-proof, traceable and distributed bookkeeping, which greatly improves the security of the blockchain, reduces the loopholes in the payment process, and ensures that each payment instruction made through the blockchain can be executed smoothly and safely.

In the traditional cross-border payment mode, payment instructions will be processed in chronological order, and daily clearing will be carried out. In order to ensure the accuracy of data, banks also need to conduct a manual reconciliation. Such complex procedures will consume a lot of time, and sometimes a remittance may take up to three days. However, blockchain technology easily avoids intermediaries, does not need banks or third-party payment institutions, and allows both parties to quickly and freely realize cross-border payment and settlement through point-to-point method. At the

same time, the existence of smart contracts guarantees 24-hour payment at any time and real-time receipt, which is convenient and fast, significantly speeds up the speed of payment and settlement and capital flow, and allows both parties of the transaction to know the progress of the transaction and the completion of the transaction at any time, greatly improving the efficiency of cross-border payment.

First of all, the costs in the traditional cross-border payment mode are mainly generated from the clearing of various intermediary institutions. When using Swift system for cross-border payment, not only the handling fee to the intermediary agency and agent bank, but also the cable fee and transfer fee, which vary from about 25-35 dollars. When using blockchain for payment, the transaction cost of a transaction is reduced to about \$10 due to the absence of these intermediaries. In addition, due to the introduction of the virtual currency of "Swiss currency" in Ripple mode, that is, the Swiss currency can be used to transfer any currency such as US dollar, Japanese yen and RMB, which also greatly reduces the payment cost. According to statistics, only through the Ripple platform can save 33% of the cost of cross-border transactions, while if the use of the Swiss currency as the intermediate currency can increase to 42%, up to 60%.[4]

3.2. Risks of cross-border payment based on blockchain technology

3.2.1. Technical risk

With the development of computer and other technologies, the asymmetric encryption technology of blockchain is becoming increasingly fragile. The blockchain is composed of data management layer, network layer, consensus management layer, incentive layer, collaboration layer, contract management layer and other modules. The main functions of different modules are the combination of asymmetric network encryption P2P module network, hash algorithm, Merkel tree and other network technologies and encryption algorithms.[5] Because traditional code writing errors cannot be transmitted, they will not cause major accidents, and blockchain technology will store all information at each node, so it is difficult to make up for errors once they occur.

3.2.2. Legal risk

The payment process of blockchain is anonymous, so users may encounter the problem of stealing or deleting personal private keys, which seriously threatens the interests of relevant assets and information owners. However, due to the imperfect domestic laws on blockchain, it is difficult to provide effective protection for similar issues.

3.2.3. Financial risk

The issuing mode of digital currency on the blockchain platform cannot be adjusted with the market at present, which is likely to cause serious interference to the market order in the future. Although the blockchain has been gradually applied and has become a new cross-border payment mode, China has not yet fully trusted it.

4. Conclusion

The application of blockchain technology for cross-border payment is an important innovation in the financial field, which has a good market prospect, but there are also many uncertainties, and it is necessary to do a good job in applying the new model of security measures.

4.1. Strengthen the development of blockchain technology

Blockchain technology should improve decentralized data results and interaction mechanisms, lay a good data and credit foundation for business, optimize cross-border payment systems, and better serve the parallel social space. [6]At the same time, we will increase efforts to train technical talents in the blockchain field, build a complete training system for talents in the "finance+blockchain" field, and reserve talents for the development of China's cross-border payment field.

4.2. Improve blockchain industry standards and supervision regulations

At present, China has not promulgated a complete set of laws and regulations on the blockchain technology field, which leads to the lack of compliance in solving problems related to blockchain, the difficulty of achieving fair and fair supervision, and the easy disruption of market order. Therefore, the legislative department needs to work together with the government and blockchain-related technology companies to balance the interests of all parties and improve

relevant laws and regulations.

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