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Chinese Strategies for Blockchain Cross-Border Payment System Development

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Abstract
This paper examines the application of blockchain in the field of cross-border payments. First of all, this study analyzes the basic principles and characteristics of the operation of blockchain from the perspective of the underlying architecture, and then discusses the economic theoretical issues contained in blockchain around the "triple paradox theory", "free currency theory" and "transaction cost theory". Secondly, Ripple, a typical representative of blockchain cross-border payment, is selected as an example, the differences between Ripple and the traditional cross-border payment system SWIFT are compared. Finally, through a comparative study of cases, the mechanism of optimizing cross-border payment by blockchain and the constraints of cross-border payment by blockchain are found, and on this basis, the corresponding research conclusions and policy suggestions for the development of cross-border payment by blockchain are put forward.
Keywords: Chinese Strategies, Blockchain, Ripple, Cross Border Payments, SWIFT.

Introduction

In 2008, Satoshi Nakamoto wrote Bitcoin: A peer-to-peer electronic cash System (Bitcoin: A Peer-to-Peer Electronic Cash System describes the architectural concept of electronic cash system based on P2P network technology, encryption technology, time stamp technology, etc., marking the birth of Bitcoin. Since then, Bitcoin and the underlying technology of Bitcoin, the Blockchain, have gradually entered everyone's field of vision and have received increasing attention. The blockchain technology that underpins Bitcoin's implementation is only 15 years old, but it enables a level of trust about money that could only have been established by strong governments or institutions in the past, using only computer code and mechanism design. Blockchainis a chain data structure that combines data blocks in a chronological order, and an immutable and immutable distributed ledger that is guaranteed by asymmetric cryptography. In essence, it is a technology that can maintain a set of immutable ledger records between participants who do not trust each other or have weak trust without intermediaries. Blockchain has the characteristics of decentralization, data cannot be tampered with, traceability, information transparency and openness, which can effectively solve the pain points of trust and information asymmetry existing in many traditional industries. Therefore, blockchain has been widely used in many fields such as finance, supply chain, Internet of Things, and supervision. And blockchain has become an important breakthrough in the innovation and development of China's financial field.

With the opening up of countries around the world after the epidemic, cross-border e-commerce, overseas studyand overseas tourism are growing, and the user group of cross-border payment is also growing. Relevant data show that in 2022, the global cross-border payment volume has reached 39 trillion US dollars, accounting for about one- third of global GDP, and it is expected that the cross-border payment market will have a broader space for development in 2023. However, in the face of such a broad cross-border payment market and demand, the development level of the existing cross-border payment system does not match it. Cross-border payment is faced with many problems such as long payment chain, high cross-border payment cost, opaque information and hidden financial risks, which cannot meet people's growing demand for cross-border payment. The international financial community has begun to pay attention to this issue, and in 2019 began to comprehensively study how to improve cross-border payment services, and at the same time began to explore how to use the most cutting-edge financial

science and technology in cross-border payment systems to change the existing situation and help develop cross- border payment systems. The decentralization of blockchain technology, data cannot be tampered with and other characteristics, and finance have a natural convergence point, can effectively solve the current cross-border payment field pain points, help build a faster, safer, more transparent cross-border payment model. Financial and commercial giants such as jpmorgan Chase, HSBC and Ant Financial have invested heavily in the research and development of blockchain, intending to use the latest fintech power to improve financial infrastructure and develop cross-border payment business.

In summary, starting from the pain points existing in traditional cross-border payment business, this paper explores the application mode of blockchain technology in the field of cross-border payment, in order to provide reference for the application of blockchain technology in cross-border payment business in China.

With the vigorous development of blockchain technology, some financial institutions have begun to try to put blockchain technology in cross-border payments. Can blockchain technology solve the pain points of cross-border payments? What are the characteristics of the application of blockchain technology in cross-border payment business? What effect does it have? Around these issues, this paper takes Ripple, a cross-border payment system based on blockchain technology, as an example to study the application of blockchain in the field of cross-border payment, and believes that this research has important theoretical and practical significance for the development of cross-border payment:

Ripple cross-border payment system has been used by many financial institutions in foreign countries, and has achieved good application results. This paper not only studied and compared the operation mode and application scenario of Ripple cross-border payment and bill business in detail, but also analyzed the operation mode of the traditional cross-border payment system SWIFT in detail, and more visually demonstrated the difference between cross-border payment mode based on blockchain technology and traditional cross-border payment mode. On this basis, the transaction cost, processing efficiency, security and degree of decentralization of the two modes are analyzed in detail, which can more comprehensively and profoundly demonstrate the payment business processing under the two modes and the application characteristics of blockchain technology in the field of cross-border payment. And to a certain extent, it has reference significance for other domestic commercial banks who want to improve their cross-border business through Ripple model, as well as other blockchain payment enterprises. The research conclusions and policy suggestions in this paper can provide some basis and reference for decision makers of financial institutions and technology enterprises, help them choose their own blockchain model more reasonably, and provide useful reference for enterprises to reduce transaction costs, improve payment efficiency, enhance customer viscosity and help the large-scale and commercial operation of blockchain in the field of cross-border payment.

Literature Review

Research on the Problems of Cross-Border Payment

Fan Yaohui, Xiao Jun et al. (2023) pointed out that the current global cross-border payment market obviously lags behind the developed domestic payment market of various countries, especially in terms of innovation and efficiency, not only the development speed is very slow, but even a stagnant state, which is in sharp contrast to the increasing cross-border demand of users. Wang Qing and Qian Xinzhou (2023) believe that the complex composition and institutional arrangement of the global cross-border payment system lead to the problems of high cost, poor timeliness, weak universality, low transparency, and high geopolitical risk. Most of the world's banks basically transfer information through the Society for Worldwide Interbank Financial Telecommunication (SWIFT),and the highly centralized SWIFT system is prone to financial risks, especially in recent years, SWIFT has become a means of financial sanctions. Starting with the financial game war between the United States and Russia, Xu Wenhong (2019) pointed out that the United States launched a series of financial sanctions against Russia by cutting off the connection between Russia and the SWIFT system, and Russia quickly established its own financial information transaction system for counter-sanctions to protect its financial security. It has a great impact

on the international political and economic pattern. Li Haibo (2020) pointed out that SWIFT has serious problems with financial data security. Relevant evidence indicates that SWIFT has been regularly submitting relevant cross-borderpayment information to the US Treasury since 2010, which has seriously threatened the data independence and security of the countries where SWIFT members are located, especially for most sovereign countries. If you simply rely on SWIFT for message transmission and cross-border transactions without your own independent payment system or message transmission system, you will face huge risks and hidden dangers. Li Renzhen and Guan Yunjia (2022) argue that SWIFT has become a tool of financial sanctions. Under the conflict between Russia and Ukraine, the United States, Europe and other western economies for the first time really used SWIFT to sanction Russia, intending to completely isolate Russia from the international financial system, and this sanction would destroy the fairness of the international payment and clearing system. In the face of the risk that the United States and Europe may use SWIFT to impose financial sanctions on China, China should still treat SWIFT with a cooperative attitude in the short term, and in the long run, it needs to continue to promote the construction of CIPS and accelerate the exploration of the applicability of cross-border use of digital renminbi, so as to get rid of its dependence on SWIFT. In terms of data and network security, Bloomberg (2019) believes that in cross-border payments, financial institutions retain a large number of important information contents such as the account funds information and identity information of the remitter, which are very vulnerable to hacker attacks. In addition, in the process of cross-border transactions, there are long transaction chains and many participants, and any link goes wrong. Will lead to the risk of customer information being leaked.

In terms of the cost and efficiency of traditional cross-border payments, Hu Yuxiao (2020) believes that the annual membership fee charged by SWIFT has virtually raised the entry threshold of financial institutions, resulting in many local banks having no membership but to make cross-border payments through agent banks, resulting in low universality of SWIFT cross-border payments. Li Haibo (2020) pointed out that for cross-border payments made through SWIFT's agent bank model, the receiving and payment banks, agent banks and clearing banks involved in the process need to handle accounts separately, and they need to undertake a lot of clearing and reconciliation work in the whole process, which leads to low clearing efficiency and poor capital liquidity. The core reason for these situations is that under the SWIFT model, there is no unified account structure and data standards for all participants are not unified. Liu Dongming (2020) pointed out that the technology, data norms and infrastructure conditions of cross-border payment systems vary greatly among countries, and the regulatory provisions related to anti-money laundering or anti-terrorist financing are also different, which will increase the cost of cross-border payment invisibly. Chen Hongyu and Wan Ruijun (2022) proposed that according to the current situation of cross- border payment, it is particularly important to build a cross-border payment system that meets the characteristics of the current era and practical needs, and the plan to build a cross-border payment system based on digital RMB to avoid risks should be put on the agenda as soon as possible.

Research on the Development of Blockchain Basic Technology

In 2008, after Satoshi Nakamoto's "Bitcoin: A peer-to-peer electronic cash system" was published, the blockchain began to gradually gain public attention. Yermack D (2017) believes that blockchain is a database of sequence information that is secured by cryptographic proof method, and these blocks are connected through the network and have the same structure. Such architecture makes the whole system more stable and reliable, and blockchain provides an alternative to financial ledger. According to Neyer G (2017), the distributed ledger technology of blockchain ensures that every node in the network can obtain a real copy of the ledger, and any changes to the ledger will be synchronized with the copy of the ledger, which is jointly maintained and updated by the participants. With the development of blockchain technology, the smart contract and consensus mechanism of blockchain have been further breakthroughs and development. Vital Buterin (VitalikButerin) proposed the Ethereumblockchain model on the basis of Bitcoin, and its core technology is smart contracts, and the emergence of smart contracts

has laid the foundation for the large-scale commercialization of blockchain technology. In terms of the blockchain consensus mechanism, due to the drawbacks of the Proof of Work (PoW) consensus mechanism adopted by Bitcoin, which has large consumption of computing power and power resources and slow confirmation speed, the blockchain led by Ethereum has started a new breakthrough in the consensus mechanism and proposed Proof of Stake. The different consensus mechanisms that have emerged since then have also led to the differentiation of different technical paths of public chain, private chain and alliance chain in the blockchain. Kshetri N (2017) has done relevant research on the enhancement of network security and protection of privacy by blockchain. He compares the differences between blockchain and cloud data centers from both aspects of security and privacy, and believes that blockchain-based solutions are superior to the current iot ecosystem in many aspects. In China, the research on blockchain technology is mostly based on foreign research theories. Shen Xin, Pei Qingqi and Liu Xuefeng (2016) pointed out after research that blockchain originated from Bitcoin and was the underlying technology of Bitcoin. Based on Bitcoin and Ethereum, blockchain was subdivided into six levels. He Pu et al. (2017) gave a comprehensive and detailed description of the proof-of-work mechanism of blockchain, P2P distributed network technology, time stamp, hash algorithm and asymmetric encryption technology. Han Xuan and Liu Yamin (2017) summarized and analyzed the current mainstream consensus mechanism, and proposed that by organically combining different consensus mechanisms and improving them, the problems and defects of the single consensus mechanism could be made up, and the role of the consensus mechanism could be better played.

Research on the Application of Blockchain Technology in Cross-Border Payments

Regarding the application of blockchain in the field of cross-border payment, the topics studied by domestic and foreign scholars mainly include how blockchainimproves the efficiency and security of cross-border payment, the risks and challenges of blockchain in cross-border payment, and the legal and regulatory aspects of blockchain.

In terms of improving the efficiency and security of cross-border payment, Tong Maodi, NiuZhe and Chen Dingqiang (2018) found through comparative research that "trustfulness" is one of the important factors affecting the security of blockchain, and "trustfulness" plays a decisive role in "trustfulness", that is, if the data information in blockchain is proved to be true and reliable and has high credibility, it can be used to improve the security of blockchain. It will make both sides of the transaction more willing to trade, thereby improving the stability of the entire system, and by combining with the incentive mechanism, to achieve decentralization. This research provides us with a more effective way to better manage and protect personal privacy. He Pu and Yu Ge (2017) found that with the popularization and development of blockchain technology, more and more financial institutions and technology giants began to study blockchain and launched cross-border payment applications of blockchain. For example, Hong Kong Alipay uses blockchain technology to synchronize cross-border remittances to the Philippines, making Alipay's cross-border remittances faster and more secure; China Merchants Bank has also launched a self-developed direct link payment platform based on blockchain technology, which significantly improves the message transmission speed on the direct link payment blockchain platform and can be compressed to the order of seconds. Although blockchain technology has obvious advantages in cross-border payment, it is still unable to achieve large-scale application of blockchain cross-border payment due to the limitations of blockchain technology level, legal supervision blank and immature international rules. In the Bitcoin White Paper, Satoshi Nakamoto discussed the application of blockchain in cross-border payments, and pointed out that blockchain can achieve peer-to-peer payments, eliminate the need for traditional intermediaries, and provide faster and more secure payment methods for the public.

In terms of risk control and challenges of cross-border payment, Cheng Chiguang and Wang Chao (2018) showed through an empirical analysis that most central banks around the world focus on payment and clearing when studying blockchain technology at present, and this development trend may lead to two problems for central banks: on the one hand, central banks may worry that their core systems will

collapse; On the other hand, the central bank may also think carefully about how to achieve the best settlement scheme. Zhang Aijun (2017) compared the two different payment models of Ripple and SWIFT, arguing that Ripple can "fragment" the business, so that it can better solve the needs of users. Wang Juanjuan and Song Baolei (2018) believe that although blockchain-based cross-border payment can play its unique advantages in simplifying transaction processes, improving payment efficiency, and reducing settlement risks, it should still be cautious before the relevant payment system is perfected.

In terms of the legal and regulatory aspects of blockchain, Ma Li, Zhu Shuo et al. (2018) reviewed the research status of domestic research on the legal and regulatory issues of blockchain. The study found that the current domestic blockchain legal and regulatory system is not perfect, and there are problems such as lack of supervision, legal risks and compliance challenges. The study also proposed some solutions, such as strengthening regulatory cooperation, improving laws and regulations, and strengthening information disclosure and risk warning. Zhao Lei and Shi Jia (2020) conducted in-depth discussion and research on the status quo and challenges of domestic blockchain regulation and found that the decentralization and anonymity of blockchain brought difficulties to regulation, involving legal and regulatory issues in privacy protection, anti-money laundering, anti-terrorist financing and other aspects. The study recommends strengthening the legal and technical capabilities of regulators and formulating corresponding regulatory policies and standards to promote the healthy development of blockchain technology.

Literature Review

In the process of searching and sorting out the existing literature in the academic circles at home and abroad, this paper searches a large number of academic papers based on the title of the paper, focusing on the keywords such as "blockchain", "cross-border payment" and "Ripple", which provides rich materials and research basis for the research of this paper. By reviewing the literature, it can be found that low efficiency, high cost and hidden risks are common phenomena in cross-border payment at present. Meanwhile, scholars also recognize that blockchain has the characteristics of decentralization, reliable data and immutable. Some scholars have proposed that blockchain technology has a wide range of practical application effects in cross-border payments, but some scholars believe that blockchain technology itself has great uncertainty, and the technology itself is relatively risky, and how to use blockchain reasonably and safely needs further consideration. At present, China is encouraging the positive development of blockchain technology, but in the field of cross-border payments, most projects are still in the experimental stage and have not been large-scale promotion. Therefore, this study takes Ripple, a typical representative of the global cross-border payment system, as a case, and studies the application of blockchain in cross-border payment on the basis of summarizing the research achievements of previous scholars, hoping to provide a case reference for the application of blockchain technology in cross-border payment in China.

A Comparative Analysis of Ripple and SWIFT

Ripple's cross-border payment model based on a non-cryptocurrency model is most similar to the traditional cross- border payment system's SWIFT processing model. By comparing the differences between the two in business processing process, account processing mode, compliance supervision and risk control, the characteristics and advantages and disadvantages of the two can be clearly compared.

Comparative Analysis of Service Processing

Comparison in Payment Information Verification

Under the traditional SWIFT model, when the remitter initiates the remittance, the remitter's identity, account and compliance are verified by the remitter's bank, and the remitter is charged the remittance fee after confirming that the remitter is correct. At this stage, the verification of identity information is usually done manually, and the accessand review of customer information is limited to the information stored in the remitting bank's system. On the one hand, the manual screening ability is limited, and on the other hand, the relevant information of customers is also limited, so there are problems

such as low efficiency and unreliable verification of identity information.

In terms of remittance costs, the remitting bank can only specify its own fees, but it cannot accurately judge the receiving bank and the fees involved in the process. Especially for cross-border remittance business that needs to be completed through multiple agent banks, the remitting bank can only estimate the total cost, which may or may not cover the whole process of remittance. When there is an additional agent bank charge that exceeds the total amount of fees paid in advance by the customer, it is necessary to recover from the remittance customer. In the traditional mode, there are many intermediary banks and intermediate links in remittance, and the fees are not transparent, which leads to high communication costs, reconciliation costs and remittance fees of cross-border remittance, and also affects the customer's remittance experience.

In the Ripple mode, because the receiving and payment banks are on the same blockchain, the customer information collected and verified by the system is stored in the blockchain, and the receiving and payment banks have a unified information base for the customer information on the chain, whether it is the customer of their own bank or the customer of the other bank, and the information is open and transparent, and both sides can call the verification customer information at the same time and at any time. In terms of information verification, the efficiency can be significantly improved, and the problem of incomplete information and asymmetric information can be avoided, and the security of remittance can be further improved and the risk of remittance can be reduced. Because Ripple mode is point-to-point payment, there is no intermediary intermediary agent bank, so the two-point and first-line process is very simple, for the remittance costs of both parties, in the information verification stage, the banks of both parties calculate the corresponding fees and interact with each other in the first time, the remitter can know their remittance costs and exchange rates in the first time. The simplification of the process, the openness and transparency of customer information and transaction information reduce the time and cost of information verification, and effectively improve the efficiency of cross-border remittance.

Comparison in Payment and Settlement

In the traditional SWIFT model, information flow and money flow are handled separately. Because there are multiple intermediary links of agent banks, the information flow needs to be serial, from the remittance line to the intermediate line, and then from the intermediate line to the final receiving line, the process is long. In the fund transfer stage, the remitter's funds have been deducted at the time of remittance, and for the payee, it is necessary for the receiving bank to receive the bill from the intermediary agent bank, and then make the fund transfer with the bill to receive the money. If multiple agent banks are involved in the middle, the time for the payee to receive the funds will be longer. In the traditional mode, the existence of serial and intermediate rows requires more coordination and communication links, which brings a direct impact of high cost, low efficiency, and easy to make mistakes.

Under the Ripple model, the settlement process is optimized without the participation of third-party financial institutions, and the information flow is realized through peer-to-peer, and the actual remittance cost can be clarified when the money is sent. All transactions are checked online, the payment is either successful or failed, the information flow is confirmed in parallel, there is no layer of serial confirmation, the payment and settlement process is simple, the cost is clear. The reduction of intermediary agent banks reduces the process, reduces the cost, and greatly improves the efficiency of payment and settlement.

Comparative Analysis of Accounting Processing Modes

Under the traditional SWIFT model, accounting is done within individual financial institutions. After the remittance bank deducts the customer's funds, the information flow is transmitted, and then the account is written off according to the statement of the agent bank, at least 24 hours in the middle, if it involves a long time without payment, it needs to communicate with the agent bank and then carry out accounting processing such as offset according to the situation. In this mode, the account structure is not uniform, there are many intermediate links, and the information is not transparent. For example, only the

financial institution has the right to view the relevant accounting processing, the final transaction information and customer information, and the two parties to the transaction do not have the actual information, and the accounting processing is completely subject to the account books issued by the agent bank, and there is the possibility of manual accounting processing errors and tampering. In the actual business work of the bank, due to the information of various agent banks is not synchronized, therewill often be a debit and cancellation of the accounting processing situation, the root cause is that the relevant information is not transparent and not open.

In Ripple mode, distributed ledger is used. Through the above payment process and fund flow diagram, it can be clearly seen that the transaction information of both sides of the transaction is synchronized, and the transaction success or failure can be immediately confirmed when remittance is made. All transactions and accountingprocessing are completed synchronously, and there is no message lag, asynchronization, and non-disclosure. In the Ripple mode, on the one hand, it will greatly reduce the workload of manual reconciliation, improve the efficiency of accounting processing, and on the other hand, it is also conducive to reducing the operational risk and the risk of accounting data tampering.

Comparative Analysis of Compliance Supervision Effect

In the traditional SWIFT model, relevant business information, including but not limited to the identity information of both parties to the transaction, remittance information, remittance time and so on, needs to be submitted to the internal compliance department or external regulatory body of the company in advance or after the transaction is completed. Under the traditional model, information sources are diverse and information barriers exist, making it impossible for regulators to verify the true situation of cross-border transactions and the true information of both parties to the transaction. In addition, countries and departments have different requirements and standards for reporting, which makes financial institutions need to spend higher time and manpower costs in data reporting and data storage.

In Ripple mode, all transaction information is on-chain, blockchain technology through its decentralization, data open and traceable, immutable characteristics and the unique advantages of distributed ledger, so that regulatorscan query and review relevant information at any time, and can set automatic compliance processing conditions and procedures in advance, automatic screening and execution. It can effectively improve the efficiency of supervision, reduce the cost of supervision, and achieve a better effect of supervision.

Comparative Analysis of Risk Control Capabilities

In the traditional SWIFT mode, the agent bank holds a large number of customer account information, transaction information and other private information, which is easy to become the object of hacker attack. From the point of view of previous cases, centralized institutions such as agent banks and SWIFT, once the transaction records are tampered with by hackers, it is difficult to detect and repair the first time, easy to generate money laundering, illegal transfer of funds and other risks, plus due to the centralized nodes of centralized institutions, once the system is attacked, it will face a huge risk of paralysis.

In Ripple mode, Ripple takes a complex and effective approach to network security. First, Ripple is a decentralized system based on distributed ledger, which is difficult for hackers to attack. Even if a node is attacked, it will not affect all users due to the synchronization mechanism of distributed ledger. Second, Ripple uses asymmetric cryptography principle to design a new set of key system, which can realize the confidential communication between different institutions. Third, at the transaction level, Ripple adopts a geometric multiple increase in the consumption of Ripple coins for malicious attackers to prevent network malicious attacks. These cybersecurity technologies effectively ensure the security of Ripple's cross-border payment system and improve the system's risk prevention and control capabilities.

Constraints of Blockchain Cross-Border Payments

Limitations of Endogenous Contradictions

The blockchain cross-border payment system can achieve second-level account arrival and

complete the whole process of transactions, but from the processing speed, such as Bitcoin can only complete 7 transactions per second, although some new blockchains can achieve tens of thousands of transactions per second, but compared with the processing speed of payment systems such as Alipay is still far away. The source of this problem lies in the trinity of blockchain technology, the most important thing is that the degree of decentralization and the consensus mechanism do not coexist, and between the two. The lower the degree of decentralization, the higher the consensus mechanism will be; conversely, when the degree of decentralization of the blockchain is higher, the consensus mechanism will be lower, which directly determines the longer the transaction delay and the lower the transaction throughput. In general, the more nodes involved in the blockchain, the more security and tamper-proof information can be guaranteed, that is, the more nodes on the chain, the more secure the transaction. However, short transaction time and fast payment speed are the advantages of blockchain in cross-border payment, which creates a contradiction, because the data on the chain needs to be agreed by the number of nodes on the chain in order to confirm the information, although the more nodes, the safer and higher the trust, but the more data, the longer the authentication time, which is negatively related to the transaction time. Therefore, when the number of nodes is small, the blockchain technology can cope with it, but if the large-scale application, the number of transactions and transaction nodes increase rapidly, the existing blockchain technology architecture is difficult to meet the real payment needs. At present, the blockchain "how fast and good" scheme does not exist, and the alliance chain only meets the security and scalability in the triad problem, but gives way to decentralization, not fully centralized, but multi-centralized or semi-decentralized. The contradictions inherent in blockchain technology greatly limit the application scenarios of blockchain. In the current era of continuous progress in science and technology, which application mode of blockchain to choose, how to achieve scene landing and commercial promotion, need to break through their own technical bottlenecks, weigh and multi-party game.

The Double-Edged Sword of Immutability

The immutable nature of the blockchain data is a double-edged sword, which helps the authenticity of the transaction data while increasing the risk of crime under certain circumstances, because once the transaction is confirmed on the chain of the whole network, it cannot be modified, even if the transaction is illegal, it cannot be canceled. For example, It.Gox in Tokyo, Japan, applied for closure in 2014 due to the theft of 850,000 bitcoins, even if It.Gox was the world's largest bitcoin trader with certain guarantee strength at that time, it could not escape this outcome. In addition, although blockchain technology solves the problem of on-chain data trust, it does not solve the problem of trust before the data is on the chain. For the data itself is born on the network (such as Bitcoin), belongs to the blockchain native data, data from the birth is recorded on the block, from the first transaction is in accordance with the rules of the blockchain for multi-node verification, synchronization, information is open and immutable, can ensure the true accuracy of the data. But if the data is not native data, but is input from the chain to the chain, then no one can guarantee the true reliability of the data, because if the data itself is fake, then all the advantages of the blockchain will lose their fundamental significance. Because the data off the chain and the data on the chain are difficult to overcome, how to judge the credibility of the information off the chain is a difficult point, which is also an important reason why many blockchain projects cannot be landed. Especially in the financial sector, if the data uploaded to the blockchain cannot be guaranteed to be absolutely correct, it is likely to lead to economic activities separated from the real economy and deepen the virtual nature of finance.

Data Explosive Storage Problem

Blockchain has the characteristics of storage redundancy, as the amount of data increases, the distributed storage of blockchain needs to have a huge storage space to accommodate massive transactions and ledger synchronization. The existing scale of data processing and storage makes it difficult for blockchain to meet the technical conditions of C-side business, because in high-frequency trading in the payment field, each additional consensus node means the addition of entire market data storage, and the cost of distributed storage will also increase dramatically. The explosive storage problem will cause

instability in the number of nodes in the alliance chain. In the alliance chain, the greater the number of participating financial institutions is not the better, but mainly depends on the amount and fixed cost that the issuing enterprise is willing to pay to the intermediary alliance. For example, when building the alliance blockchain bill payment and settlement system, the number of alliance consensus nodes needs to be set more carefully.

The Access Mechanism, Industry Supervision and Laws and Regulations are not Sound

At present, the research on blockchain technology is still in the exploratory period, and governments and enterprises all want to become leaders in the field of blockchain technology, and have set up alliances to build their own blockchain systems and standards. However, how to balance privacy and openness, how to balance centralization and decentralization, has not yet formed a unified cross-border payment standard. On the one hand, there is a natural convergence between blockchain technology and finance, and the development prospects in the field of cross-border payments are broad. Commercial banks, insurance companies, payment companies and other institutions have begun to invest in and research and development of blockchain, but because a unified access standard has not yet been formed, this has laid hidden dangers for the healthy development of the later industry. Although relatively complete and strict laws and regulations and regulatory systems already exist in the financial field, relatively complete laws and regulations have not yet been established for the cross-border payment system based on new technologies such as blockchain. If disputes arise in cross-border payment, they will face difficult problems, which may hinder the popularity of blockchain technology in the development process. Although blockchain makes transactions more secure, the process more transparent and traceable, and reduces the difficulty of supervision, the application of blockchain technology has subversive changes to the payment process under the traditional model, and the complexity and depth of transactions are very different from that under the original supervision model. If the regulator still conducts supervision and management in the original way, it will not beable to control the transaction. On the one hand, there may be a dramatic increase in regulatory workload, and onthe other hand, due to completely different processing models, the regulatory workload may not have the effect of regulation at all. In addition, in the global blockchain, each blockchain has its own characteristics, and the national conditions of countries, the development level of financial markets are different, and the agreements are not the same, which require the development of regulatory frameworks according to the actual situation and differentiated regulation.

Realistic Chinese Strategies on Blockchain Cross Border Payment Development

Strengthen Policy Guidance to Encourage the Application of Blockchain in Cross-Border Payments

Blockchain technology has great potential to solve the pain points of traditional cross-border payments; however, there are still some challenges to overcome, such as inadequate regulation, security and other issues. Therefore, policy guidance should be strengthened in the future to encourage the development and application of blockchain technology. First of all, the government should formulate more clear regulations to regulate the application of blockchain technology, so as to better play the advantages of blockchain technology itself.

Currently, regulatory standards for blockchain technology vary from country to country, making it difficult for companies to determine how to legally conduct business. Secondly, it is also necessary to encourage technology companies and the financial industry to continue to deeply discuss blockchain technology and increase scientific and technological investment. Although the blockchain technology itself has high security performance, due to the characteristics of its consensus mechanism, attackers still have the probability of destroying the entire system by attacking all nodes, so a series of measures must be taken to improve the security of the system. Blockchain cross- border payment system to really large-scale landing, we must break through the technical restrictions, we should have a positive attitude towards emerging technologies, encourage investment in human and financial resources to explore the operating mechanism and business model of blockchain cross-border payment. Finally, the government should pay attention to the investment in the cultivation of blockchain talents and innovation capacity building,

strengthen the cultivation and introduction of talents in the field, and improve the professional quality and skill level of relevant personnel. Only by constantly improving the quality of high-tech talents can we better meet the future development needs of blockchain.

Improve Blockchain Industry Standards and Regulatory Regulations

The revolutionary technology of decentralization of blockchain technology poses a huge challenge to the existing regulatory regime. Because blockchain technology is still in the immature stage, countries hold different attitudes towards the application of blockchain technology, and there is still no effective solution to the regulatory problem of blockchain technology, and the lack of regulatory measures inevitably hinders the application and development of blockchain technology. Therefore, we need to deeply study blockchain technology and develop regulatory strategies and regulatory schemes that adapt to the new model to ensure the stability of the financial system. We also need to further unify the blockchain industry standards, actively participate in the construction of the international standard system, adjust regulatory thinking, and improve regulatory regulations. The current regulatory methods and regulatory means are not suitable for use in the application of blockchain, and are still suitable for the regulatory model centered on central settlement institutions. Therefore, it is suggested that the regulatory authorities should adjust the focus of supervision, fully leverage the strength of science and technology, and improve the supervision and management of blockchain.

Break Through Technical Limitations in Blockchain Applications

First of all, the blockchain has the characteristics of storage redundancy, with the growth of the amount of data, the massive transactions on the blockchain will inevitably need huge storage space to meet the needs of the distributed storage of the blockchain, if there is not enough storage space, it will limit the development of the blockchain, sothe current should vigorously develop and break through the quantum storage technology to break through the storage bottleneck of the blockchain. Secondly, in the workload confirmation mode on the blockchain public chain, the determination of the blockchain adopts a "minority decides the majority" way, that is, when a party's computing power exceeds 51%, it can be amended and tampered with. In a public chain in its infancy, although there are fewer checkout nodes, there is the possibility of 51% easier control, which has an impact on the security of the data. Finally, although the smart contract of the blockchain has the role of "full contract", in practical application, there are still problems that the decentralized prediction model is not perfect, and the quality and standard of the smart contract are not high or low. The technical security problems of the above blockchain itself will limit the development of blockchain, and financial technology should be vigorously developed, such as solving the bottleneck of blockchain technology through the progress of quantum computing technology and quantum storage data technology, and using the power of emerging technologies to break through the technical limitations of blockchain and maximize the advantages of blockchain.

Reasonable Selection of Blockchain Application Mode

Reasonable selection of blockchain application mode is crucial to achieve the wide application of blockchain technology in the financial field. First, it is necessary to understand the characteristics and advantages of blockchain technology. Blockchain is a decentralized distributed ledger technology, which is characterized by immutable, open and transparent, safe and reliable, etc. These characteristics have natural convergence points with finance, and can solve the pain points of cross-border payments in many scenarios. Second, it can not be blockchainfor the sake of blockchain, and it is necessary to consider the application needs of blockchain technology in different scenarios. It is necessary to find the application scenarios that are truly suitable for blockchain technology in the field of pain points. For example, for cross-border payments, the advantage of blockchain technology is to eliminate intermediate links and improve transaction efficiency; For domestic payments, it is necessary to pay more attention to data privacy protection and other issues. At the same time, it is not possible to blindly pursue the public chain, such as for private enterprises, private chain is enough to meet the needs, and even has more advantages thanthe public chain and alliance chain, and can solve practical problems, so it is necessary to choose the

appropriate type of blockchain according to the actual needs and situations.

Finally, for the choice of completely independent research and development of blockchain, or cooperation with financial technology companies, this also needs to be judged according to its own economic strength, the actual problems faced, rather than blindly follow the trend. To sum up, we should track and analyze the potential risks of blockchain technology and application according to the technical characteristics and development changes of blockchain, and choose the appropriate development route and application mode in combination with our own actual situation.

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