



Research on the Development Trend of Traditional Financial Industry Based on Blockchain Technology

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Authors' contributions

This work was carried out in collaboration between both authors. Author CZ designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author CZ managed the analyses of the study. Author ZF managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

The combination of Internet technology and the financial industry makes information more symmetrical, improves the efficiency of payment and settlement in the financial industry, reduces the cost of currency financing, and makes risk management more effective based on big data technologies. Just the improvement of form and means has not changed the nature of finance. With the development boom of financial technology, blockchain technology seems to have become the key to start a new technological revolution. The value transfer of blockchain technology and the absence of credit intermediation, high security, decentralization, and de-monetization are a fundamental disruption of the financial industry.

Keywords: *Traditional financial industry; blockchain technology; distributed shared accounting technology.*

1. INTRODUCTION

The essence of blockchain is a distributed shared accounting technology. By using a new asymmetric encryption authentication method

and a peer-to-peer network architecture, maintaining an unmodifiable continuous ledger database can enable participants in the blockchain to directly realize value transfer without the need to recognize each other and

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establish a trust relationship, no longer relying on offline intermediaries. Blockchain technology is known as "the second-generation Internet technology that goes beyond information transfer." This reconstruction of the credit paradigm is of great significance to financial institutions and financial innovation, and is expected to become an important underlying technology for financial technology.

2. THE MAIN ADVANTAGES OF BLOCKCHAIN TECHNOLOGY

Unlike traditional distributed databases, the blockchain introduces the concept of "everyone keeps accounts". Each participant has the right to keep accounts, and everyone keeps the latest ledger and all historical records. This highly redundant storage method of data can enhance the transparency of information between non-trusting subjects, realize tamper-proof data and leave traces throughout the process, and then promote multi-party information sharing and collaborative operations. In actual business, the on-chain business data can realize the electronicization of paper documents and the credibility of electronic information, reduce the frictional cost of distrust between multiple entities, and solve the traditional business method that consumes a lot of manpower and materials to verify the authenticity of documents and bills. The audit issues are convenient for financial institutions to implement risk management and control.

The biggest problem in building an information system across departments is which organization or department manages the centrally stored data. The unified distributed ledger technology of the blockchain naturally solves the "business sovereignty" problem, effectively achieving identity parity, power parity, responsibility parity, and benefit parity for each participant. Real-time synchronization and update of data among all participants make cooperation more convenient and quicker, and the enthusiasm of partners is enhanced.

Regulatory departments can add regulatory nodes on the blockchain platform to obtain regulatory data in a timely manner, and flexibly customize the statistical caliber of financial supervision, the granularity of regulatory data, etc. to achieve rapid analysis. At the same time, the use of programmable scripts such as smart contracts to increase the corresponding regulatory rules. The focus of supervision has gradually increased from the compliance review

and risk control of financial institutions to the identification and monitoring of systemic risks. Realize the whole system of supervision before, during and after the event, effectively prevent financial risks and maintain financial stability.

3. DISTRIBUTED LEDGER IS EXPECTED TO BECOME AN IMPORTANT FINANCIAL INFRASTRUCTURE

From the perspective of cost, efficiency and security, distributed ledger, as the most important innovation of digital currency, is expected to become an important financial infrastructure in the future. This is also a core issue related to digital currencies. Distributed ledgers weaken the role of intermediaries. Peer-to-peer transactions save high intermediary costs [1]. It can be expected that with the development of computer computing power and network communication technology, the distributed ledger can further improve transaction efficiency. The distributed ledger is jointly maintained by multiple accounting computers on the network, which provides a more secure transaction guarantee mechanism than the centralized accounting scheme [2]. The distributed ledger provides a chain data structure. The ledger has the characteristics of easy auditing and traceability. If it is widely used, it will save a lot of review audit costs.

Distributed ledgers have positive significance for the development of financial markets. In terms of securities clearing and settlement, by reducing the intermediary involved in trading and sharing data between trading participants, the distributed ledger can effectively improve the efficiency of securities clearing and settlement and reduce the time required for securities trading to minutes or less [3]. In terms of securities registration and circulation, by maintaining a unique shared data collection, the distributed ledger can reduce data inconsistencies among transaction participants and ensure the uniqueness and convenient circulation of securities registration. The smart contract mechanism of the distributed ledger can further improve the operability of securities trading contracts and increase the ability of automatic contract execution. In terms of reporting and supervision, distributed ledgers can facilitate the collection and collation of data, improve the quality of reports, risk management capabilities, and the efficiency of supervision, and improve the transparency and immutability of transactions [4]. In terms of counterparty risk, the distributed ledger can reduce counterparty credit

risk because it shortens the time for transaction settlement.

It is worth pointing out that the evolution of financial infrastructure does not happen overnight, and the application of distributed ledgers has a gradual process. First, the widespread use of distributed ledgers requires the widespread digitization of social goods and services. Second, distributed ledger applications require the simultaneous development of other financial infrastructure such as regulatory, legal, and accounting standards. Researchers have realized that people holding and trading digital assets through distributed ledgers will be an important challenge to existing regulatory, legal and accounting standards [5].

4. BLOCKCHAIN TECHNOLOGY CHALLENGES THE ROLE OF CREDIT INTERMEDIARIES OF TRADITIONAL FINANCIAL INSTITUTIONS

The core function of modern finance is credit intermediation. From the "credit media theory" proposed by early classical economists such as Adam Smith and John Mueller to the "credit creation theory" in monetary finance, credit has always been the basis of financial activities. At the same time, the problem of information asymmetry determines the necessity of intermediation in the process of financial transactions [6]. According to the research of George Akeroff and others, there are high information barriers between participants in different markets, and there are more or less differences in the understanding of product information between supply and demand parties, which will lead to asymmetric market information. The problems of "moral hazard" and "adverse selection" cannot be avoided. The party that has comprehensive information often uses the information advantage to win the other party's interests, and credit problems arise. The phenomenon of fraudulent loans and insurance fraud in the financial field is caused by the demand side of funds trying to cover up their bad information and even providing false information, which the fund supply side cannot identify. These actions have seriously affected the efficiency of resource allocation and hindered the normal operation of the financial system [7].

The advent of the Internet allows information to be delivered in real time. Marked by mobile internet, cloud computing and big data, the Internet has entered a new era, and more and

more human activities are moving from offline to online. This change has shortened the distance between people, businesses and customers, and greatly alleviated the adverse effects of information asymmetry [8]. However, transactions in the Internet era are mainly direct interaction of information, rather than directly face to face between the two parties to the transaction. The two parties to the transaction do not know each other well enough, so there are insurmountable obstacles to trust. The foundation of credit construction in Internet finance is the collection and analysis of credit data [9]. The accuracy of credit ratings and risk control models mainly depends on the accumulation and understanding of data by Internet financial institutions. Credit data has become a core element of Internet financial enterprise competition [10]. However, traditional credit data acquisition is limited to specific credit reporting enterprises. Due to the influence of their own interests and uses, it is difficult to control the credit data obtained by these enterprises, which is often not effectively and quickly shared with Internet financial institutions. Internet financial institutions are in a dilemma because they cannot obtain the qualifications for credit reporting and lack the real and effective data they need to develop their customers. Therefore, big data technologies such as Internet finance and P2P technologies, while effectively reducing the cost of credit construction, have also caused problems of "data islands" and even "credit islands".

The emergence of blockchain technology has effectively solved this problem. Blockchain technology can establish credit between completely strange nodes through consensus algorithms, asymmetric encryption, and other technologies, rebuilding the credit mechanism of the credit industry [11]. All credit data is on the blockchain. As long as each company has the private key provided by the customer, it can access related information, and the information is difficult to be tampered with, safe, reliable, open and transparent. The distributed ledger in the blockchain maintains and processes the ownership records through the nodes in the decentralized network [12]. The value transfer method no longer depends on the centralized ledger maintained by the credit intermediary. This new credit mechanism uses algorithms instead of offline intermediaries or third-party platforms as the endorsement of trust [13]. It automatically performs operations such as exchanges and ownership transfers through

smart contracts, making "de-intermediation" possible. Internet finance is gradually approaching the non-financial intermediary or market situation corresponding to the general equilibrium of Walras, and it has a huge impact on the business of traditional financial institutions based on simple information intermediaries on the underlying structure.

5. BLOCKCHAIN TECHNOLOGY TRIGGERS CHANGE IN CURRENCY FINANCING

The purpose of finance is to realize the financing of monetary funds. Since Adam Smith published "The Wealth of Nations" in 1776, the relationship and positioning of the "two hands" of the market and the government have been the focus and core of the debate among different economic schools. With the rise of the neo-liberal economics school, the Austrian school represented by Hayek has once again entered the spotlight of economic theory and practice. In the shadow of the cyclical financial crisis, the question raised by Hayek was raised: Is the right to issue currency naturally owned by the government? Can fully decentralized and denationalized currency issuance be able to form a more stable currency system through free competition?

The blockchain, which was born in the international financial crisis in 2008 and was originally introduced as the underlying technology of Bitcoin, is an embrace of Hayek liberalism [14]. The emergence of thousands of encrypted digital currencies represented by bitcoin, especially the emergence of the first national legal digital currency, Venezuela's petroleum coin, has led to reflections on the current credit currency system with government credit as the endorsement. Compared with traditional currencies, the issuance and trading of digital currencies have the characteristics of low cost and high efficiency. With the improvement of commercialization innovation and supervision, digital cryptocurrencies are bound to obtain further development, and traditional currency and payment theory will also be enriched.

In addition to the currency issuance mechanism, the blockchain can also effectively change the current currency circulation mechanism and improve the efficiency of financial operations. The blockchain system will replace the government and central bank to control and control the money supply. Funds are injected into

the public money supply system by the blockchain according to market supply and demand and enter the trading market. The central bank turned to directly monitoring the operation of the public currency system. Traditional financial institutions such as banks only need to obtain funds through verification and "mining" and inject them into the trading market. Through the blockchain, the way currency enters the trading market is more direct, and its dependence on financial institutions has been further reduced, thereby realizing the fundamental change in traditional financial operations through currency financing [15].

6. BLOCKCHAIN TECHNOLOGY PROMOTES THE TRANSFORMATION OF TRADITIONAL PAYMENT AND SETTLEMENT SYSTEMS

Finance, as the blood of the economy, "payment is the blood vessel of finance." In the process of financial exchange and currency debt transfer between different entities, payment has become "the entrance to all business activities, the center of data and traffic". The payment and settlement system is the core infrastructure of the financial system, which concerns the efficiency and stability of the financial industry. In fact, the construction and maintenance of the payment and settlement system, along with the birth and development of banks, has become one of the basic responsibilities of central banks in various countries in the modern economy. The traditional payment and settlement system relies on clearing centers to carry out data interaction between banks and solve the credit problem through endorsement of centralized institutions. Therefore, it is subject to the constraints of multiple centers and multiple links, and the costs of reconciliation, clearing and settlement are relatively high. At the same time, the design of a large number of repetitive manual processes is not only inefficient, but also high in operational and moral risks. The Internet has improved the efficiency of payment settlement through technical means, but has not changed its centralized structure. On the one hand, it is easy to be attacked by hackers and the security is not high; on the other hand, a single point of failure often leads to the paralysis of the entire system and poor stability [16].

The core characteristic of blockchain technology is that it can realize value transfer in a near real-time manner without the participation of trusted third parties. Compared with the traditional

payment system, the blockchain payment enables the two parties to exchange data directly and realize point-to-point payment without involving intermediaries [17]. Greatly reduce the systemic risk of centralized payment methods, while having cost and efficiency advantages. The system automatically completes the settlement process and realizes "transaction is settlement". In the field of payment and settlement, blockchain technology can not only transform the existing central bank payment system, but also carry out innovation in the fields of cross-border payments, digital bills and smart payments. Among them, under cross-currency, cross-border, and multiple economic contracts, cross-border payments with high cost and low time efficiency are excellent scenarios for applying blockchain technology in payment settlement systems [18].

7. BLOCKCHAIN TECHNOLOGY OPTIMIZES FINANCIAL MARKET RISK MANAGEMENT

Finance is an uncertain and dynamic economic process, and financial risk is an inherent attribute of financial activities, and it generally exists in modern financial industries. With the evolution of financial risk management theory, in addition to preventing losses, modern risk management also includes profit and return-centric activities such as risk pricing, which has become the main business of various financial institutions. The transformation of information transmission by traditional Internet technologies has brought information transparency. Big data provides a convenient means for information processing and credit analysis, which all contributes to the improvement of risk management to a certain extent. However, Internet finance itself also has major security risks. On the one hand, big data itself requires the support of huge databases. With the concentration of data, inherent database storage and encryption technologies are difficult to prevent risks such as data tampering and information theft. On the other hand, credit risk is high, and P2P lending platforms are constantly defaulting.

The distributed accounting methods, consensus algorithms, and modern encryption methods of the blockchain make the data decentralized while being open, transparent, and traceable, making it difficult to be tampered with and stolen. At the same time, under the new credit mechanism built by the blockchain, all information is open, transparent, truthful and effective, which helps to

establish whitelists and blacklists to accurately perform credit ratings for customers and effectively perform ex-ante risk control in industries such as insurance and loans. . In addition, blockchain technology can also effectively prevent financial fraud in the loan industry. The blockchain's unique distributed encryption method and data tamper-proof technology can ensure the security of transaction information. The irreversible and traceable source characteristics make the process and result of Internet financial transactions uniquely identifiable, thereby reducing duplication and forgery Possibility of fraud. At the same time, with the assistance of smart contracts, all transaction processes can be executed intelligently, reducing operational risks.

8. CONCLUSION

As the foundation and core of the modern economy, the financial industry is an important driving force for global economic development and one of the most centralized industries. Friction factors such as information asymmetry and transaction costs in the financial market make it difficult to establish an effective credit mechanism between the two parties in the transaction. The existence of a large number of centralized information intermediaries and credit intermediaries in the industrial chain increases the financing cost of funds and reduces the overall operating efficiency. In the 21st century, although the top-level design of finance and business process innovation are surging, due to the limitation of the core function of credit intermediation, the underlying logic and basic structure of the financial operation model have not been substantially improved. The blockchain is based on distributed ledgers, consensus algorithms, peer-to-peer transaction networks, and modern cryptographic methods. It has the inherent attributes of openness and transparency of information and immutable data. The potential of the infrastructure.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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