

Blockchain With Real and Sharing Economy

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Abstract. This paper studies the impact of blockchain on the real economy and sharing economy. Considering that the topic is relatively cutting-edge and the availability of relevant data is not high, this paper adopts a theoretical comb to show the internal logic of the impact of blockchain on the real economy. Firstly, this paper briefly combs the relationship between the real economy and blockchain, and then analyzes the positive impact of blockchain on the real economy. Finally, from the sharing economy, we will talk about how to serve the real economy with the idea of block chain. The research in this paper provides a good reference for how to learn the blockchain and its impacts.

Keywords: Blockchain, Real economy, Sharing economy.

1. Introduction

In recent years, with the rapid development of new digital currencies represented by bitcoin, blockchain technology, which is the underlying technology of bitcoin, has also attracted more attention. Compared with the traditional centralized database, the blockchain makes it decentralized, non-tamperable, traceable, multi-party through the application of traditional technologies such as distributed data storage, P2P transmission, consensus mechanism, encryption algorithm and smart contract. The essence of blockchain is a distributed database in which different nodes participate together, which is an open public ledger. Specifically, blocks are formed from data packets, and there is an encrypted hash value calculation in between, which links transaction information of different time periods to form a blockchain. Blockchain is an underlying technical framework with universal adaptability. In addition to applications in finance and economics, its potential application areas include medical care, elections, copyright, notarized car rental, and network security.

Digital cryptocurrency is one the most successful application of blockchain. As of now, the global market value of digital cryptocurrencies will exceed 200 billion US dollars. Compared with traditional currencies, digital cryptocurrencies have no central bank endorsement, and their monetary value is closely related to the market and is not controlled by monetary authorities, making digital cryptocurrencies highly liquid. At the same time, as the underlying technology, blockchain not only ensures security, but also considers the needs of market anonymity. This has gradually increased the proportion of digital cryptocurrencies in cross-border capital flows, which has brought difficulties to the central bank in capital supervision and has impacted the traditional banking industry. The prototype of the blockchain data structure is to connect files through a Merkle tree structure to form "blocks", and then link each block to form a chain to greatly reduce the time required to find a specific file. Merkle tree is a tree data structure in cryptography and computer science. Each leaf node is labelled with the hash of the data block, while nodes other than leaf nodes are labelled with the cryptographic hash of the label of its child nodes. Hash trees enable efficient and secure verification of the contents of large data structures. The storage of data in the blockchain uses the data structure of Merkle Trees. The most common and simplest form of Merkle trees is Binary Merkle Trees, which is shown in Figure 1.

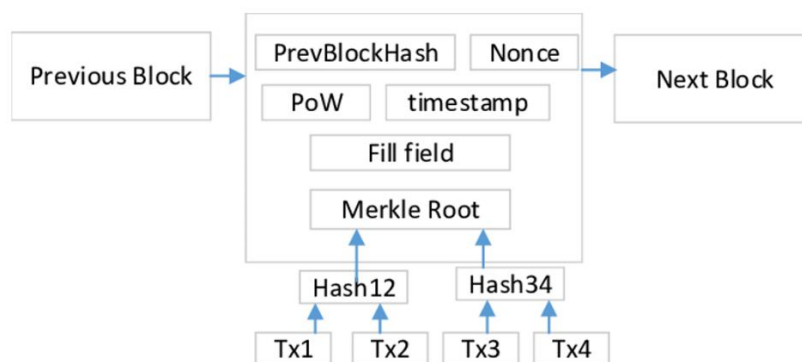


Figure 1 The data structure of Merkle Trees

In the structure of Merkle Tree, these data blocks are grouped into two groups, and then a data structure with two hash pointers is established for each group, and each pointer corresponds to a block. The pointer to the data block of the next layer is stored in the parent node of the previous layer. We can go back to any place in the list by using the hash pointer to ensure that the data has not been tampered with. Just like a blockchain, when someone tampers with some data blocks at the bottom of the tree, the hash pointers of the previous layer will not match, and the other party will continue to tamper with this block. The behavior of changing the data will eventually be transmitted to the top of the tree. As long as we remember the top hash pointer, any attempt to tamper with any data can be detected by us. Finally, the Merkle Root Hash is generated through the Merkle Tree algorithm, and is stored in the Block Header as the summary of the transaction list, which is shown in Figure 2.

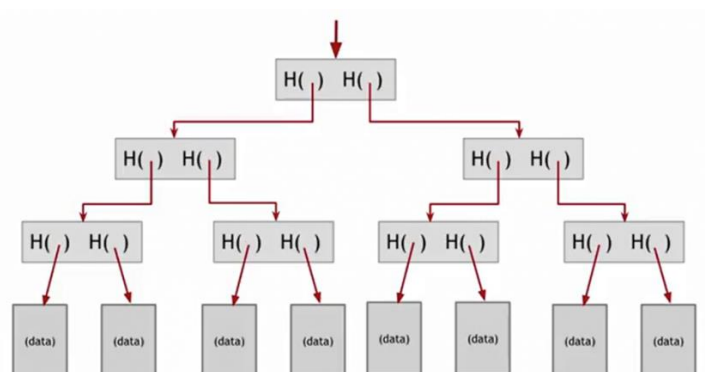


Figure 2 The Merkle Tree algorithm

This research article will discuss how the real economy, sharing economy, and monetary policy impacted by blockchain and cryptocurrency. The development of the real economy is the integration of blockchain and traditional industries to create a new development ecology. Deeply integrate the innovative achievements of the blockchain into various economic and social fields, this enhances the innovation and productivity of the whole society and forms a broader economic development form based on blockchain technology and implementation tools. Its underlying meaning is to realize industrial upgrading through the blockchainization of traditional industries.

2. Literature review

In Lim Hong Hin (2019) [3], he focused on some of the significant research issues and challenges, statistical report of current blockchain technology usage and future direction for highly secure technology of new era of digital economy. Beside digital economy, Jingfei Cheng (2019) [4] mainly focused on effects brought by blockchain to sharing economy. This paper studies the development status of the sharing economy and blockchain technology, and analyzes the shortcomings of the sharing economy model and blockchain technology. After that, Jingfei studies the feasibility of

applying public blockchain technology to the sharing economy and analyzes the advantages and possible problems faced by the public blockchain technology in the application of the sharing economy. Furthermore, Tangyun Zhang (2021) [5] also focus on research on the impact of the integration of blockchain and real economy on enterprise operation. As the increasing application of blockchain in different industries, it impacts some emerging markets. In the research article the Niforos (2017) [6] illustrates how blockchain can Impact Emerging Markets. After that, researcher mentioned about the potential setback of blockchain and the difficulty to implement this technology. However, the emergence of blockchain enable some illegal activities. In this article, Sean Foley, Jonathan R Karlsen, and Tālis J Putniņš (2019) findings suggest that cryptocurrencies are transforming the black markets by enabling “black e-commerce.” After that, the development of cryptocurrency also affects the monetary policy. Liu Jin (2018) [7] in this research mainly introduces impacts brought by cryptocurrency to the monetary policy. There are three main channels for the impact of blockchain technology on the monetary system and monetary policy: first, non-legal digital currency channels; second, financial infrastructure and financial market channels; and third, legal digital currency channels. This article analyzes these three channels respectively. It can be seen that the blockchain technology itself is neutral, and the application of different subjects and scenarios will have different effects on monetary policy. In addition, Kang and Lee (2019) [8] talked about cryptocurrency and monetary policy. In his research, he mainly tries to answer two main questions: can cryptocurrencies acquire the role of money? And what are the implications for central banks and monetary policy?

Although the above literature has a comprehensive analysis of blockchain and cryptocurrencies, the application of blockchain in different industries and the impact on the economy from different perspectives have not been explained in great detail. We will go further with the impact of cryptocurrencies and blockchain on the economy and monetary policy, as well as the emerging market and industry opportunities for blockchain technology.

3. The impact of blockchain on the real economy

3.1 Real economy

In recent years, in addition to the financial field, blockchain has been widely used in major sectors of the real economy, becoming a new carrier for coordinating the integration of information technology with various industries such as medical care, transportation, and energy, and has changed these industries to a certain extent. Blockchain has broad application prospects in the medical field in terms of authentication and privacy protection. Since many user data, including medical records, are extremely private, high security measures are required for information protection. However, the current centralized management information system is often unable to cope with various network attacks, and is prone to large-scale data leakage. Even companies with mature security technology and closed systems have experienced multiple data leaks with serious effects. The highly secure encryption algorithm and distributed storage authentication system of blockchain are suitable for solving this problem. For example, Tiron uses blockchain technology to complete the authentication and privacy protection of medical records. By establishing complex and programmable permission protection, all data cannot be read and tampered with at will. Even if some blocks in the blockchain system are attacked, it will not cause any problems.

At present, inefficient data processing and data sharing solutions restrict the further development of the transportation industry. OEMs, suppliers and software companies are all working on using blockchain technology to solve this problem. A new transportation ecosystem based on blockchain begins to form. In 2018, BMW, Ford and other automakers and suppliers established the Mobility Open Blockchain Initiative, MOBI, which aims to develop the potential uses of blockchain technology. Companies covered by MOBI, which are linked to 70% of the world's auto manufacturing operations, will create a blockchain ecosystem specifically geared towards the automotive industry, with potential applications including vehicle identification, supply chain

tracking, vehicle payments, data marketplaces and pricing systems. The system is open to the outside world and adopts encryption protection technology to effectively ensure the security of transaction records. In addition, in the field of logistics, blockchain technology can record all links in the process of goods from issuing to receiving. By creating a consensus network, we can directly locate the problem in the intermediate link of express delivery and ensure the traceability of information, so as to avoid the occurrence of problems such as loss of package and wrong receipt of express delivery. Express delivery requires private key signatures of both parties. Everyone has their own private key and whether to sign for receipt or delivery only needs to check the blockchain. If the user does not receive the courier, he will not sign for it, and the courier cannot forge the signature, which will undoubtedly greatly improve the efficiency and accuracy of logistics delivery.

3.2 Opportunities brought by blockchain to the real economy

Firstly, blockchain facilitates lower transaction costs. In the total cost of an enterprise, the production cost is only a part of it, especially with the expansion of the enterprise scale, the proportion of financial cost and management cost is getting higher and higher. Both financial costs and management costs are essentially transaction costs, which are incremental costs caused by imperfect systems, especially incomplete information. The financial cost is caused by the fact that the financial institution does not have the credit information of the enterprise, and the management cost is caused because the enterprise does not have the information of the suppliers, sellers and consumers. In the future, after the introduction of the blockchain into the real economy, the credit information of all related companies will be publicly available, and the immutability of the blockchain will make it too expensive for companies to upload deceptive data. Therefore, financial institutions can obtain accurate credit information of loan companies. And enterprises themselves can also obtain accurate information on suppliers and sellers, which ultimately greatly reduces the financial and management costs of creditworthy enterprises. Those companies with bad credit will face higher financial costs and management costs, and will be gradually eliminated, greatly reducing the transaction costs of the entire real economy.

Secondly, blockchain is conducive to improving collaboration efficiency. How to improve the efficiency of collaboration between enterprises has always been the core issue of economics and management discussions. On the one hand, driven by profit maximization, it is usually difficult for enterprises to maintain long-term cooperative relations, because non-cooperation can always maximize short-term benefits. On the other hand, due to the constraints of information asymmetry, it is difficult for enterprises to make effective cooperation decisions, resulting in a greatly reduced efficiency of effective cooperation. The emergence of blockchain has the potential to fundamentally change the above situation. Specifically, the data and information of the enterprise's cooperation will be presented on the nodes of the blockchain without reservation. Once a company is inconsistent with the cooperation, it is difficult to find the next partner, resulting in the high cost of the cooperation. At the same time, the information required for enterprise cooperation is open on the blockchain, which will greatly improve the efficiency of enterprises in making cooperation decisions. More importantly, the smart contracts in the blockchain can automatically execute the content stipulated by the cooperation when the specified conditions are met, such as automatic payment after receiving the goods without being restricted by time and place, which greatly improves the real economy collaborative efficiency.

Thirdly, blockchain is conducive to improving the external environment. A good external environment is an important guarantee for the high-quality development of the real economy. Blockchain can improve the external environment faced by the development of the real economy in at least three aspects. One is the credit environment. Since the credit information on the blockchain is completely open and cannot be tampered with, companies can obtain the credit information of other companies at a low cost or even zero cost, or disclose their own credit information. More importantly, this information is accurate, and it solves the problem of trust in the process of market transactions. The second is the financial environment. The biggest difficulty in financial services for the real

economy lies in the difficulty and high cost of loans for small and medium-sized enterprises. These problems are attributed to the concerns of financial institutions about the default of small and medium-sized enterprises. After the introduction of blockchain, financial institutions have authorized the current accounts of enterprises. It has a clear understanding of the loan and historical credit records, which fundamentally solves the biggest problem that small and medium-sized enterprises are difficult to obtain credit loans. The third is the government environment. After the introduction of the blockchain, the relevant information of the enterprise can be obtained directly from the blockchain, and there is no need to repeatedly inquire about the relevant government agencies, which is of great value and significance for the remote operation of the enterprise.

4. The application of blockchain in the sharing economy

With the development of information technology, more and more scholars have begun to pay attention to the advantages of blockchain technology and have begun to apply this technology to the sharing economy. Some well-developed companies have applied this theory to specific product optimization and launched many shared products based on blockchain technology. The sharing economy is an economic form, while the blockchain is a technological implementation [9]. From the connotation or principle of the two, the two have inherent natural similarities, and both are an ecosystem of peer-to-peer services. First, from the technical characteristics of the blockchain, each node has absolute independence, and nodes can exchange information with each other, which is very similar to the external performance characteristics of the sharing economy. Every node and service object that is served in the sharing economy ecology needs to interact and associate. Second, blockchain technology has strong data security and is difficult to be edited. In the sharing economy ecology, the information security of users is significant, which could impacts the overall reputation and even survival of the platform. The application of blockchain technology in the sharing economy can provide a very reliable guarantee for the security of users' transaction data. Third, blockchain technology has the characteristics of "smart contract", and also has the characteristics of high reliability, anti-repudiation, and convenient manipulation. When applied in the sharing economy, it can perfectly solve the situation of product reservation, dispute settlement and breach of contract compensation. Fourth, due to the decentralization characteristics of blockchain technology, theoretically, if it is used in the sharing economy ecology, the logical center hub of the sharing platform can be eliminated, reducing the processing pressure of the transaction center, thereby reducing operating costs. It can be seen that the application of blockchain to the sharing economy is very helpful to the symmetrical development of public information and the benign adjustment of the market.

Both the blockchain and the sharing economy are a brand-new economic model developed in recent years. Due to the combination of the technical advantages of the blockchain and the characteristics of the sharing economy, some problems existing in the current sharing economy field have been solved in a targeted manner. The problem has brought great social and economic benefits. Compared with the previous technology, the unique data storage mechanism and operation mode of the blockchain fundamentally solve many problems existing in the traditional technology mode, which makes the blockchain highlight the following unique advantages.

Firstly, replacing traditional payment models with blockchain currency. In the traditional e-commerce field, all transaction participants must transfer transaction fees from the user's account to the service provider's bank account through a third-party organization, which involves complex transaction processes and capital flow chains. For example, in the field of shared transportation, the user must first complete the operation of paying the rental fee before using the vehicle, and submit a payment application to the corresponding financial institution through a third-party payment institution. After receiving the payment request, the bank first performs the user identity authentication operation to verify the real identity of the user to prevent illegal users from forging transaction requests from others. After the introduction of blockchain technology into the field of

sharing economy, this traditional mode of currency circulation will undergo tremendous changes. Referring to and learning from the popular digital currencies such as Bitcoin in recent years, the central bank can establish a currency blockchain and issue electronic currency based on this. Based on blockchain technology, it carries the responsibility of digital currency circulation. Each participant in the sharing economy completes the transaction on the currency blockchain by using the electronic currency they hold.

Secondly, building a user credit system based on the blockchain "smart contract" [10]. Integrity is the basis for the inheritance and development of the market economic system, and the establishment of a credit system based on market participants plays a vital role in the healthy development of the sharing economy. In the traditional sharing economy field, since different service providers operate their businesses independently, there are great differences in collecting users' credit data. This industry environment will undoubtedly have a considerable impact on future development. Taking the shared bicycle service as an example, each service provider has its own service terms and credit rating system. Different service providers may give different interpretation and processing standards for the same behavior of users. Since these data are owned by different operators, the lack of data sharing mechanism among companies has formed many information islands, resulting in the inability to display the scale effect of the data. By establishing a consortium blockchain between industries, different shared service operators can record users' credit information into the chain. Every time a transaction occurs, each node in the blockchain will actively verify the data, and update the local storage data after confirmation, so that these credit data can be provided to all operators in the industry for query and use at any time. In this way, not only can a unified credit standard for the whole industry be established, but also information and data can be shared to the greatest extent, and the scale effect of data can be exerted.

5. Conclusion

With the development of technology, the economy has been shaped in many ways. At present, blockchain is mainly applied to currency (blockchain 1.0), but in the future it will be applied to the financial field beyond currency (blockchain 2.0), and even beyond the social notarization and intelligent field in the financial field (blockchain 3.0). Overseas traditional industry giants have been laying out blockchain layout since 2014: major banks around the world set up blockchain alliance, deloitte and other famous accounting firms developed blockchain auditing technology, NASDAQ first promoted blockchain securities trading, AND IBM and Samsung jointly laid out blockchain Internet of Things. Blockchain startups are active in various fields including finance, medical care and music. Based on this perspective, this paper carries out the above research, so as to help clarify the connotation of blockchain, understand the impact of blockchain on the real economy, and better apply blockchain.

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