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The Analysis of Blockchain Application in Asset-backed Securitization

--Taking Du Xiaoman Financial ABS as an Example

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Abstract: In this article, we first give a brief introduction for the background knowledge and research motivation of the article (mainly because I want to explore the relationship between two future-filled areas - blockchain and ABS). In addition, we will give a detailed discussion of the blockchain in history, operation mechanism, and technical framework three aspects. Fully explain the advantages and prospects of blockchain technology, a more in-depth and detailed analysis of the logic of blockchain technology, and the problems solved in the traditional ABS field to lay the groundwork for the following article. Then, we will take Du Xiaoman Financial ABS as an example to introduce the operation mechanism of the project and analyze the advantages and disadvantages of the application results of blockchain by comparing the traditional ABS project and combining the achievements of Du Xiaoman Financial ABS. Finally, we will put forward some personal suggestions for improving the project from the analysis of the previous research.

Keywords: Blockchain, ABS, Du Xiaoman.

1. Introduction

Asset securitization is a financial practice that involves bundling illiquid assets with stable future cash flows and issuing marketable securities backed by these assets. This method, originating in the United States, has gained traction in China, particularly in internet consumer finance, with companies like Alibaba, Tencent, and Jingdong entering the market. However, challenges persist in the secondary market, including liquidity issues, an incomplete capital market system, subpar intermediary institutions, and inadequate regulations, hindering the market's growth. To address these challenges, blockchain technology is being embraced due to its transparency, tamper-resistant nature, and flexibility. By making asset securitization processes more transparent and secure, blockchain is becoming increasingly attractive to the industry. This paper focuses on Du Xiaoman Financial ABS, China's first blockchain-powered asset-backed securitization product, to explore the advantages and drawbacks of blockchain technology in this context. This research not only sheds light on blockchain's role in asset securitization but also contributes to the development of China's e-commerce ABS market.

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2. Literature Review

In 2008, Satoshi Nakamoto published A paper "A peer-to-peer electronic cash System", which mentioned that blockchain technology is the underlying technology of Bitcoin, is a peer-to-peer distributed transaction, can solve various problems caused by centralized institutions. However, the computing power and energy consumption of the PoW mentioned in the article are large, so KingS et al proposed in 2012 that while still consuming a lot of computing power [1], the energy consumption is mitigated, and then upgraded to make the consensus mechanism superior. Since then, many experts at home and abroad have carried out relevant research, blockchain technology has also achieved the upgrade from version 1.0 to version 3.0, this technology is becoming more mature, applicability and superiority. Blockchain technology is increasingly favored by the financial industry. P. Treleaven [2] believes that in the field of banking and financial services, blockchain technology can improve business efficiency and provide secure and authentic asset information. In the field of securitization, especially ABS, this technology has received widespread attention. Although there are many advantages in the process of incorporating blockchain technology into ABS, there are still some drawbacks and problems such as incomplete development of blockchain technology in the process of applying blockchain technology to ABS. However, with the advancement of technology and the development of related industries, these problems will gradually be alleviated. Sun Guomao [3] believes that blockchain is mainly used to allocate world resources in a decentralized basic way, the economic development of the future society can rely on the basic framework of blockchain, and the future sharing economy model will gradually replace the existing economic model. Therefore, blockchain technology has its own advantages and some drawbacks, but with the development of society and science and technology, blockchain technology and the financial field will be more closely linked, and the future of the financial technology field will be brighter.

3. The Introduction of the Blockchain Technology

First of all, let's start with understanding how blockchain works. Blockchain is a distributed ledger technology that works by recording and verifying transactions across a network of computers, creating a secure and transparent record of data. In essence, it's an underlying technology that enables network participants to replace centralized third-party institutions with computer algorithms and technology. There are three main types of blockchains: private chains, public chains, and consortium chains. Blockchain-based digital currency credit is seen as a fourth disruptive innovation, succeeding blood credit, gold and silver credit, and central bank paper credit.

There are three crucial layers in ensuring the effective operation of blockchain technology: the Data layer, the Consensus layer, and the Network layer. In the Data layer, asymmetric encryption, particularly elliptic encryption curve functions, play a significant role. Users have both a public key and a private key. In addition, the consensus layer ensures fair competition for accounting rights among nodes in the blockchain network. Last, in the Network layer, nodes use P2P technology for communication, which facilitates decentralization and supports the core functionality of blockchain. Together, these three layers work in harmony to ensure the smooth operation and development of blockchain technology.

Blockchain technology relies on three key technology frameworks: Decentralized structure, Asymmetric encryption, and Open programmability. Decentralized structure is particularly significant as it brings the P2P (peer-to-peer) concept to life. Blockchain's distributed system structure enables data storage, transmission, and verification without the need for central authorities. This decentralization eliminates the need for third-party intermediaries. Through robust computer algorithms, users can engage in direct P2P transactions, with data distributed to all nodes for

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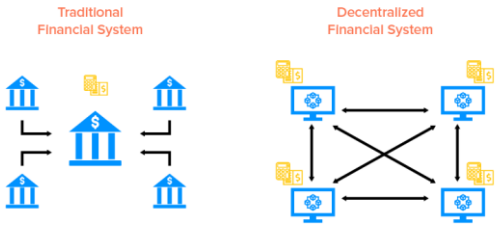
collective supervision. This transparency and efficiency address many shortcomings of traditional systems. The following Figure 1. Comparison of Two Financial Systems



Source: Distributed Accounting: From Bitcoin to Digital Currency [4]
Figure 1: Comparison of Two Financial Systems

4. The Practical Effect of Du Xiaoman Financial ABS in the Application of Supply Chain Technology

Since 2015, with the continuous upgrading of blockchain technology, Philip Treleaven wrote in his paper [3] that blockchain systems possess a number of attractive attributes for the banking and financial services markets. Duxiaoman Finance is typical of the earliest batch of companies that use blockchain technology as the underlying technology of asset management to achieve the landing of ABS products. On July 21, 2017, Baidu relied on Baidu Financial Cloud and Du Xiaoman financial blockchain and proposed Du Xiaoman Financial BaaS in the form of an alliance chain. On September 19, 2017, Baidu, along with Baiqian Leasing and Huaneng Trust, issued China's first blockchain-based ABS product, "Baidu - Changan Xinsheng - Tianfeng 2017 first phase Asset Support Special Plan" (known as "Baixin 2017-1"). They continued this approach on July 1, 2018, with the second phase, both backed by automobile consumer credit assets.

Duxiaoman financial ABS primarily operates through BaaS and AaaS subsystems. AaaS offers comprehensive services for asset securitization, managing the entire lifecycle, recording and sharing information on the blockchain, and providing basic asset services. The BaaS platform verifies transactions through nodes and, based on a consensus mechanism, links applications, loan reviews, and loans for each underlying asset. This enables the creation of smart contracts through Duomanman Trust's blockchain, allowing chain-linked enterprises like SPV and asset parties to validate trade information using private keys.

4.1. The Advantages of the Du Xiaoman Financial ABS

According to Yang Zhaojun and Li Zhongfei's article [5], Blockchain technology can greatly solve the problems in the traditional ABS system. Therefore, the introduction of blockchain technology has given us the following advantages:

1. Provide on-chain services. After the introduction of blockchain technology, a large number of previously opaque underlying assets can be on-chain in a timely manner, and the information of underlying assets can be transparently on-chain in a timely manner, which reduces the pressure of the market on ABS regulatory review. Secondly, after the information is connected to the chain, the decentralization is realized. This enhances investor information, as well as making the overall market less risky, improving product pricing and trading efficiency.

2. Smart contract. As there are many independent institutions in the traditional securitization process, which will cause many disputes and other problems. Smart contracts allow participants to immediately draft a contract and publish it on the blockchain in a timely, transparent and real manner, improving work efficiency and avoiding unnecessary risks. Just as Tang Wenjian and Lv Wen

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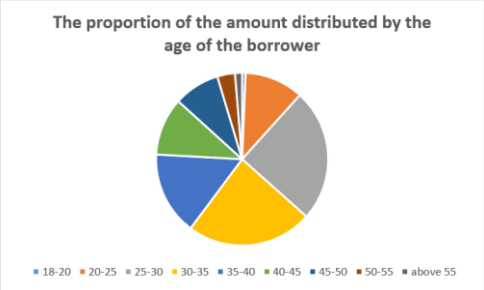
believed in the article [6], blockchain technology can reduce surplus social operating costs and surge the trust in the financing process.

3. Distributed ledger. With the ledger, it means that there is no interference from the central organization and multi-directional maintenance of a ledger so that asset information can be quickly circulated and ensure the timeliness and authenticity of assets. At the same time, the original cost of issuing, operating and monitoring assets is reduced, and the original cumbersome and redundant reconciliation work is simplified and improves the efficiency of the business.

4.2. The Analysis of the Du Xiaoman Financial ABS

For the underlying asset pool, In the process of asset securitization, it is crucial to have a high-quality underlying asset pool, which is not only conducive to the final credit rating but also affects the financing cost of enterprises. There are a total of 6,069 loans in the asset pool of Bai Xin 2017-01. Among them, small loans of 0-25w accounted for 89.72% of the total asset pool.

In the figure 2, we can see that these loans are mainly distributed in Shandong, Henan, Beijing and other regions, and the distribution of other provinces is also relatively uniform, so these loans are relatively difficult to be affected by regional economic fluctuations, and the qualification is relatively safe.



Source: CNABS

Figure 2: The proportion of the amount distributed geographically by the borrower

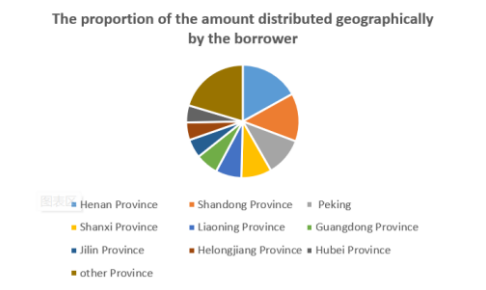


Figure 3: The proportion of the amount distributed by the age of the borrower

As shown in Figure 3, from the perspective of the age of the borrowers, the underlying asset pool is safe, because most people between the ages of 20 and 50 have stable jobs and good health, so the risk of default is much higher than that of the over-aged or under-aged.

In general, "Baixin 2017-01" is mostly small loans, and the region is more dispersed, the age of the borrower is mostly in the golden age, so the risk of default is low, and the risk of regional economic impact is lower, so the quality of the underlying assets into the asset pool is relatively high.

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5. The Deficiencies and Improvement of Du Xiaoman Financial ABS

It is true that the Du Xiaoman financial ABS has indeed achieved good results, improving some of the drawbacks of traditional ABS, purifying the ABS market, and making the ABS market brighter. However, Du Xiaoman financial ABS still has some shortcomings that need to be paid attention to. In the following, I will analyze the deficiencies in detail and put forward corresponding suggestions for improvement.

5.1. The Deficiencies of Du Xiaoman Financial ABS

In the process of studying the degree of financial ABS, I found three significant deficiencies:

1. The types and scale of the underlying assets are small. We can see that Du Xiaoman Financial ABS mainly focuses on consumer finance, and most of the assets entered into the pool belong to small loans with a short term. Some large deposits, deposits with a long-term and working capital loans of enterprises with high credit ratings, can be entered into the pool. In this respect, the underlying asset pool of Du Xiaoman is relatively restricted. As a result, the types of asset pools are single and limited.

2. There are bottlenecks in blockchain technology. On the road of blockchain development, admittedly, blockchain version 1.0 to version 2.0 has indeed made great progress, and the emergence of new functions such as smart contracts can indeed allow us to apply to a variety of fields, but on the road to version 3.0 upgrade, we still have a long way to go, when actually applied to the Du Xiaoman financial ABS, There will be hidden dangers and shortcomings in information management and application costs.

3. Blockchain technology has a weak legal foundation. Particularly in its application to asset-backed securitization (ABS), where smart contracts play a central role. Smart contracts are considered civil contracts governed by the Contract Law, which outlines contract formation, execution, termination, and dispute resolution principles. This may lead to legal disputes over civil liabilities, requiring adjustments to contract provisions. Furthermore, China's current legal system doesn't officially recognize the validity of smart contract content and form, making it impossible to confirm the contract's validity solely based on its program code. This legal gap, combined with inadequate legal provisions and control measures, has allowed criminals to exploit blockchain's open programming nature for network fraud.

5.2. The Suggestions for the Du Xiaoman Financial ABS to Improve

As the information age develops faster and faster, the combination of blockchain technology and finance becomes more and more popular, but there are still several prominent problems I mentioned above that need to be solved and improved so that the future of this technology will be brighter. In response to the problems that arise in this area, I offer some personal premature insights:

1. Enhancing Du Xiaoman Financial ABS, diversifying underlying assets is crucial. Given China's emphasis on rural development, focusing on agriculture-related loans aligns with national policies, serving dual purposes. In addition to broadening the asset base, diversifying investor types is equally important. Allowing qualified pension insurance funds, foreign institutional investors, and enterprises to participate in the process can expand the range of participants in asset securitization, fostering a more diverse and inclusive investment landscape. This approach aligns with the goal of promoting social financing.

2. Enhancing cutting-edge research on blockchain. In the realm of blockchain technology, there are several key areas that require improvement. Cross-chain technology is currently a focal point in applying blockchain to finance, which can facilitate asset transfer and value flow, thereby creating a more robust ABS system. Furthermore, the advancement of multi-chain technology is essential, which not only addresses the storage needs for various data types but also significantly enhances

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blockchain performance. Research into optimizing the "privacy computing + blockchain" model is essential. This approach ensures the authenticity and security of underlying assets. Ultimately resulting in a more efficient ABS system that reduces associated financing and operational costs.

3. Strengthen legal control over blockchain technology. Legal ambiguities regarding blockchain technology often lead to disputes and undermine contract validity. To address these issues, it's essential for governments to bolster legal oversight of blockchain technology and crack down on illicit activities. This proactive approach not only curbs fraudulent practices but also resolves disputes and validates smart contracts.

6. Conclusion

In recent years, blockchain technology has developed rapidly. On the current road of blockchain technology development, the technology is striving to move forward on the road to version 3.0. Blockchain technology is mainly based on three core technologies: the decentralized structure, the asymmetric encryption, and the open programmable field. Build blockchain technology to make the information on the chain transparent and true. The information is updated in time and the information is immutable, so the technology can be widely used in various fields, especially in the financial field. On the development path of ABS, traditional ABS has disadvantages such as asymmetric market information and a long operation cycle, which hinder the development of ABS. The advantages of blockchain can just make up for the shortcomings of traditional ABS. Therefore, this paper takes the blockchain-combined ABS issued by Du Xiaoman as an example to study the practical effects of combining blockchain technology with ABS. After analyzing ABS issued by Du Xiaoman underlying asset pool, it is concluded that this ABS has a good underlying asset pool and high-quality product structure. Good results have been achieved in practice. However, this ABS still has some shortcomings: The types and scale of the underlying assets are small, there are bottlenecks in blockchain technology, and the legal basis for blockchain technology is weak. Therefore, combined with the current situation and market situation, I believe that first, we should Enrich the underlying assets and investors, then introduce more third-party institutions, and finally pay attention to the development of cutting-edge technologies of blockchain technology and strengthen legal control over blockchain technology, so that the combination of blockchain technology and ABS will have a brighter prospect. The development of the fintech sector will have a better future.

References

[1] *King, S., & Nadal, S. (2012, August 19). PPCoin: Peer-to-Peer Crypto-Currency with Proof-of-Stake. https://bitcoin.peryaudo.org/vendor/peercoin-paper.pdf.Larimer, D. (2014) Delegated proof-of-stake white paper. https://8btc.com/doc-view-151.html.*

[2] *Treleaven, P. (2016). Blockchain Technology in Finance. Computer, 50(9), 14-17. https://ieeexplore.ieee.org/abstract/document/8048631.Yang, Z. J. & Li, Z. F. (2018). Financing Model Innovation with Blockchain-based Asset Securitization. SOCIAL SCIENCES IN SHENZHEN, 2020(6), 47-59.*

[3] *Sun G. M. (2017, February 8). The essential characteristics of blockchain and its application in the securities industry. Shanghai Securities News.*

[4] *Treleaven, P. (2016). Blockchain Technology in Finance. Computer, 50(9), 14-17. https://ieeexplore.ieee.org/abstract/document/8048631.Yang, Z. J. & Li, Z. F. (2018). Financing Model Innovation with Blockchain-based Asset Securitization. SOCIAL SCIENCES IN SHENZHEN, 2020(6), 47-59.*

[5] *Yang, Z. J. & Li, Z. F. (2020). Financing Model Innovation with Blockchain-based Asset Securitization. SOCIAL SCIENCES IN SHENZHEN, 2020(6), 47-59.*

[6] *Tang W. J., & Lv W. (2017). Blockchain: How will it redefine the world. China Machine Press.*