



# Research on the Influence of Technology-Driven Supply Chain Finance Innovation on the Development of New Quality Productivity

Zhimin Zhan\*

School of Accountancy, Guangzhou College of Technology and Business,  
Guangzhou, 510850, China

\*Corresponding author's e-mail: newcopt@163.com

**Abstract.** This study deeply analyzes how the innovation and application of scientific and technological means, especially the alliance chain technology, in the field of supply chain finance can effectively promote the development of new quality productivity. The core of the research is to explore how to use these cutting-edge technology tools to provide more cost-effective and efficient financing solutions for rural small and micro rural enterprises. Through a detailed analysis of the application effect of alliance chain technology in practical scenarios, this study evaluates its profound impact on supply chain finance and new quality productivity. In addition, the study further explores the sustainability and innovation of alliance chain technology and its interaction with the policy environment, providing a richer perspective for the comprehensive understanding of technology-driven supply chain finance innovation.

**Keywords:** Alliance chain technology, supply chain finance, new quality productivity, case study

## 1 Research Background and Purpose

With the continuous advancement of scientific and technological progress, alliance chain technology has gradually become a hot spot in the field of fintech. Especially in the field of supply chain finance, the introduction of alliance chain technology provides a new opportunity for financial innovation. In recent years, China has been committed to solving the pain points in traditional financial services through fintech, especially in supporting the real economy and small and micro rural enterprises. In this context, supply chain finance has become an important direction of financial innovation with its unique advantages, and alliance chain technology has injected new impetus into its development.

## 1.1 Background and Literature Review

In terms of research history, the early research mainly focused on the basic concepts and operation mode of supply chain finance. With the continuous progress of technology and the continuous expansion of application scenarios, the focus of research gradually turns to how to use technology to improve the efficiency of supply chain finance and reduce risks. In recent years, with the development of emerging technologies such as blockchain and artificial intelligence, the research of supply chain finance has also entered a new stage, paying more attention to the innovation and application of technology.

As a modern financing means, supply chain finance has been widely used in the world. By conducting the effective integration of the capital flow, information flow and logistics of each link in the supply chain, it provides the participants with more convenient and efficient financing services. In China, the development of supply chain finance has been strongly supported by the policy level, especially in the Guangdong-Hong Kong-Macao Greater Bay Area, where its unique geographical location and economic environment have provided a broad space for the innovation of supply chain finance.

In recent years, the research on supply chain finance is increasing, covering its development process, technology application, risk control and other aspects. In the initial stage, supply chain finance mainly focuses on the financing needs of the supply chain, and provides short-term loans, accounts receivable financing and other services for traders and manufacturers. With the rapid development of information technology, supply chain finance gradually pays attention to other links in the supply chain, and realizes information sharing and data integration through the technology platform. In the innovation stage, supply chain finance further promotes innovation, and a series of new financial instruments and service models emerge.

In terms of technology application, the researchers discussed the application effect of various technologies in supply chain finance. In particular, blockchain technology is considered to be an effective means to solve the problems such as information asymmetry and high cost in supply chain finance. Blockchain-based supply chain finance technology solutions can improve the credibility and security of transactions, reduce the participation cost of intermediate links, and accelerate the flow of funds. In addition, AI has also played an important role in supply chain finance, improving the overall operational efficiency of the supply chain.

## 1.2 Research Purpose

The purpose of this study is to deeply analyze the application status, existing problems and future development trend of alliance chain technology in supply chain finance, and to explore its potential impact on the development of new quality productivity. Through a systematic review of relevant literature and field research, we expect to provide useful policy suggestions for the healthy development of supply chain finance, and promote the further deepening of fintech innovation in China.

Technology development and supply chain finance innovation. Chain technology, in the alliance chain, shows significant advantages in the field of supply chain finance.<sup>[1]</sup> Through the construction of the supply chain finance platform based on the alliance chain, all participants can realize the real-time information sharing and collaborative operation, effectively reduce the risk of information asymmetry, and improve the financing efficiency.<sup>[2]</sup> At the same time, alliance chain technology can also ensure the authenticity and tamability of transaction data, providing a more reliable credit evaluation basis for financial institutions.

In terms of supply chain finance innovation, the application of alliance chain technology has promoted the emergence of new financial products and services.<sup>[3]</sup> For example, the accounts receivable financing, warehouse receipt pledge financing and other modes based on the alliance chain have effectively solved the financing problems of small and micro enterprises. In addition, the alliance chain technology can also be combined with the Internet of Things, big data and other technologies to realize real-time monitoring and data analysis of the whole process of the supply chain, and improve the accuracy and effectiveness of financial services.

Research on the development and influence of new quality productivity. Technology-driven innovation of supply chain finance plays a positive role in promoting the development of new quality productivity. First of all, by optimizing the financing process and improving the financing efficiency, the supply chain finance innovation can help to reduce the operating costs of enterprises and enhance the market competitiveness.<sup>[4]</sup> Secondly, the application of alliance chain technology strengthens the trust and cooperation among the participants in the supply chain, and promotes the coordinated development and overall optimization of the supply chain. In addition, the innovation of supply chain finance based on the alliance chain also helps to promote the digital transformation of the financial industry and improve the quality and efficiency of financial services.

However, it is worth noting that technology-driven innovation in supply chain finance also faces many challenges. The shortage of technology maturity, cost input and talent reserve may restrict its further development. At the same time, the lag of relevant laws and regulations may also become an obstacle restricting the application of technological innovation.<sup>[5]</sup> Therefore, we need to strengthen technology research and development and promotion efforts, improve the relevant policies and regulations, to provide a strong guarantee for technological innovation.

## 2 Research Technique

This study uses the combination of case analysis method and quantitative data analysis to deeply analyze the application of alliance chain technology in the field of supply chain finance. Based on international standards and domestic compliance standards, we selected a series of representative alliance chain projects, just like WeBank, JingDong, as the case study objects, and by collecting relevant financial data, operation data and user feedback information, we conducted a comprehensive analysis of the operation

situation, financing effect and risk control of the project. Since 2015, domestic technology giants such as WeBank, Ant, Tencent, Baidu, JD.com, and Ping An have joined the alliance chain camp and launched platforms such as FISCO BCOS, Ant Chain, TrustSQL, Super Chain, Zhizhen Chain, and Yizhang Chain FiMAX. In 2017, FISCO BCOS was the first to be fully open source. The time for the deployment of alliance chains at home and abroad was basically the same. Internationally, CEV and several international investment banks established R3 Corda in September 2015, and the Linux Foundation launched Hyperledger Fabric in December of the same year.<sup>[6]</sup> Domestic Internet giants such as BAT also took the lead in establishing alliance chain R&D teams in 2015, including WeBank. As my country's regulation intensifies, cryptocurrency trading and mining are suppressed, and public chain projects are rarely compliant. However, alliance chains represented by WeBank's FISCO BCOS have gradually become the mainstream of domestic blockchain project development with less attention. WeBank has established a distributed core system architecture since its establishment in 2014 and has insisted on developing towards an open banking model. The closed nature of private chains is difficult to meet the openness of WeBank. The financial industry has always been a highly regulated industry. As my country's first private bank and Internet bank, compliance is a prerequisite for long-term development in technological innovation. Compared with public chains and cryptocurrencies, consortium chains without token incentives are more in line with domestic regulatory requirements.<sup>[7]</sup> On May 9, 2017, China UnionPay and JD Finance jointly announced that they had successfully tested the underlying blockchain technology. As part of the strategic cooperation agreement between the two parties earlier this year, the launch of the blockchain platform means that in the future, both parties will be able to realize more commercial applications based on the underlying platform.

## **2.1 Technology Sustainability and Innovation Motivation**

As a cutting-edge technology, the sustainability of alliance chain technology is crucial for its long-term application in the field of supply chain finance. This study analyzes the sustainability characteristics of the technical architecture, node distribution and data security of the alliance chain technology, and explores how these characteristics support its wide application in supply chain finance.<sup>[8]</sup> At the same time, the research also focuses on the power of technology innovation, that is, with the continuous evolution of technology, what new application scenarios and models of the alliance chain will emerge in the field of supply chain finance. By studying these innovation drivers,<sup>[9]</sup> we can better understand the development potential and future trends of alliance chain technology in supply chain finance.

## **2.2 The Impact of the Policy Environment on Technology-Driven Supply Chain Finance Innovation**

The policy environment plays a key role in technology-driven innovation in supply chain finance. This study analyzes the impact of policy orientation, regulation formulation and regulatory measures at the national level on the application of alliance chain

technology in supply chain finance. <sup>[10]</sup>By comparing the policy environment in different regions, the study reveals how the policy differences affect the promotion and application effect of technology. In addition, the study also discusses how policy makers can adjust and improve relevant policies and regulations according to the development of technology and market demand to better support the development of supply chain finance innovation. As shown in Figure 1.

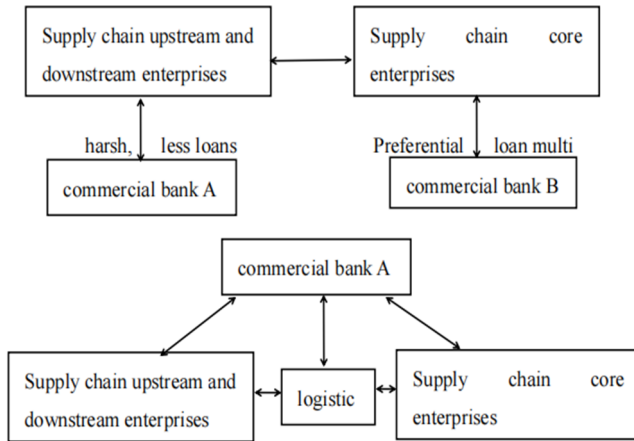


Fig. 1. Supply chain financing model

### 2.3 The Application Case of Alliance Chain Technology in the Financing of Rural Small and Micro Enterprises

In order to better illustrate the application effect of alliance chain technology in supply chain finance, this study selected a number of financing cases of rural small and micro enterprises for in-depth analysis. By analyzing these cases, the study shows how alliance chain technology can reduce financing costs, improve financing efficiency and optimize financing process. These cases not only verify the practical application value of alliance chain technology in supply chain finance, but also provide useful experience and inspiration for other similar enterprises.

In conclusion, this study reveals the potential impact on the development of new quality productivity through an in-depth analysis of the innovative application of alliance chain technology in the field of supply chain finance. <sup>[11]</sup> At the same time, the research is also expanded from multiple dimensions, such as technology sustainability, innovation motivation and policy environment, which provides a richer perspective for the comprehensive understanding of supply chain finance innovation driven by technology.

### 3 Finding

The results of this study show that alliance chain technology shows significant advantages in reducing information asymmetry, improving transaction speed, reducing costs and enhancing data security. The realization of these advantages benefits from the transparent and efficient supply chain finance system built by the alliance chain technology.<sup>[12]</sup> Specifically, alliance chain technology improves the reliability of information and reduces the risk of information asymmetry by ensuring the authenticity and intamability of data; Meanwhile, by optimizing the transaction process and improving the processing speed, alliance chain technology effectively improves the transaction efficiency and reduces the transaction cost. In addition, the alliance chain technology also guarantees the security of data by strengthening data encryption and authority control, and provides a more reliable decision-making basis for financial institutions.

However, we also recognize that the rapid development of technology has also brought a series of challenges and problems.<sup>[13]</sup> For example, the lack of standardization leads to limited interoperability between different platforms, which affects the wide application of alliance chain technology; meanwhile, the lag of relevant laws and regulations also restricts the development and application of technological innovation. In response to these challenges and problems, we have put forward a series of policy suggestions, including strengthening technology research and development and standard formulation, improving relevant laws and regulations, and promoting cross-industry cooperation, in order to promote the healthy development of alliance chain technology in the field of supply chain finance.

### 4 Research Discussion

Based on the above research results, we believe that alliance chain technology has great potential to promote the development of supply chain finance and new quality productivity<sup>[14]</sup>. By building a supply chain finance platform based on the alliance chain, we can realize more efficient and transparent information sharing and collaborative operation, reduce the risk of information asymmetry, and improve the financing efficiency. This can not only reduce the operating cost of enterprises and improve the market competitiveness, but also strengthen the trust and cooperation among all participants in the supply chain, and promote the coordinated development and overall optimization of the supply chain.

However, to fully unlock the potential of alliance chain technology, we still need to overcome many obstacles. First, policy guidance at the national level is crucial, and we need to develop unified standards and norms to ensure interoperability and data interoperability between different platforms. Secondly, it is also essential to improve the relevant laws and regulations, and we need to provide a strong legal guarantee for technological innovation. In addition, promoting cross-industry cooperation is also the key to realizing the wide application of technology.<sup>[15]</sup> We need to strengthen the communication and cooperation between different industries, and jointly promote the development of alliance chain technology in the field of supply chain finance.

The research on the influence of technology-driven supply chain finance innovation on the development of new quality productivity has broad research space and far-reaching significance. <sup>[16]</sup>Future research can further expand the research field and direction, deeply explore the application potential and value of new technologies in supply chain finance, and provide strong support for promoting the fintech innovation and the development of real economy in China. We will provide more convenient and efficient financing channels to help China achieve sustained and sound economic development. For the future trend of supply chain finance, I have the following predictions and insights: First, technology will continue to deepen the innovative application of supply chain finance. <sup>[17]</sup>With the rapid development of artificial intelligence, blockchain, the Internet of Things and other technologies, they will be more closely combined with supply chain finance to provide more accurate and efficient solutions for financial institutions and enterprises. For example, intelligent risk control and credit assessment can reduce loan risk; building a more transparent and credible supply chain finance system through blockchain technology to enhance mutual trust among participants; and the Internet of Things technology can realize real-time monitoring and data collection of the whole process of supply chain, and provide more comprehensive information support for financial institutions. Secondly, supply chain finance will pay more attention to cross-industry and cross-regional coordinated development. With the deepening of globalization and economic integration, supply chain finance is no longer limited to a single industry or region, but needs to achieve cross-industry and cross-regional cooperation. This will help to break down the information barriers, realize the optimal allocation and sharing of resources, and improve the efficiency and competitiveness of the entire supply chain. In addition, green supply chain finance will become an important development direction in the future. <sup>[18]</sup>With the increasing global attention to environmental protection and sustainable development, green supply chain finance will gradually become the mainstream. By introducing green assessment standards and incentive mechanisms, promoting green production and operation in all aspects of the supply chain can not only reduce environmental risks, but also help enhance the social responsibility and brand image of enterprises.

Finally, the regulatory policies will be further improved and standardized. With the continuous expansion and innovation of the supply chain finance market, the regulatory policies will gradually follow up and improve. The government will strengthen the supervision of the supply chain finance market, standardize the market order, prevent financial risks, and provide a strong guarantee for the healthy development of the supply chain finance.

In the future, supply chain finance will show a trend of technology, collaboration, green and standardization. These trends will promote the continuous innovation and development of supply chain finance, provide more efficient, convenient and safe financial services for the real economy, and help to achieve the sustained and healthy development of China's economy. In addition, I would like to add that in the future, supply chain finance will also pay more attention to data security and privacy protection. With the continuous advancement of digitalization and intelligence, the amount of data involved in supply chain finance will increase substantially, and data security and privacy protection will become a problem that cannot be ignored. Therefore, financial

institutions and enterprises need to strengthen the protection and management of data, use advanced technology means to ensure the security and privacy of data, and prevent data leakage and abuse.<sup>[19]</sup> To sum up, the future development trend of supply chain finance will be characterized by diversification, integration and intelligence. By strengthening efforts in scientific and technological innovation, cross-industry collaboration, green development and data security protection, we can promote supply chain finance to achieve more efficient, safe and sustainable development, and make greater contribution to the prosperity of the real economy.

## 5 Conclusion and Suggestion

Based on the above analysis, this paper finally summarizes the importance of technology-driven supply chain finance innovation to the development of new quality productivity. As an important direction of financial innovation, supply chain finance can effectively solve the pain points in the introduction of traditional financial services, promote the digital transformation of the financial industry, and then promote the development of new quality productivity.

In order to realize the potential release of supply chain finance innovation and the development of new quality productivity, we make the following policy recommendations:

First of all, strengthen policy support to promote the deep integration of supply chain finance and technological innovation. The government should set up special funds to support scientific and technological innovation projects in the field of supply chain finance, and encourage financial institutions and enterprises to increase investment in the research, development and application of new technologies. At the same time, a docking mechanism between scientific and technological innovation and financial innovation should be established to promote the transformation and application of scientific and technological achievements in the field of supply chain finance.

Secondly, promote the formulation and improvement of relevant laws and regulations to provide legal guarantee for the innovation of supply chain finance. The government should speed up the formulation and improvement of laws and regulations related to the innovation of supply chain finance, clarify the rights and interests and responsibilities of all parties, standardize the market order, and reduce legal risks.<sup>[20]</sup> At the same time, strengthen supervision to ensure the compliance and soundness of supply chain finance business.

In addition, financial institutions and enterprises will be encouraged to increase investment in technological innovation and improve service quality and efficiency. Financial institutions should actively explore the use of alliance chain technology to optimize business processes, improve risk control ability and other applications, and launch more innovative products and services in line with market demand. Enterprises should actively participate in the construction and operation of the supply chain finance platform, and use new technologies to improve the level of supply chain management and financing efficiency.



Finally, strengthen cross-industry cooperation and information sharing to promote the coordinated development of supply chain finance. The government should promote the establishment of a cross-industry supply chain finance cooperation mechanism to promote information sharing and collaborative operation among different industries. At the same time, strengthen the cooperation and exchanges with the international community, introduce foreign advanced supply chain finance concepts and technologies, and promote the innovative development of China's supply chain finance.

Through the implementation of the above policy recommendations, we are expected to further release the potential of supply chain finance and promote the high-quality development of China's economy. Technology-driven supply chain finance innovation will not only improve the quality and efficiency of financial services, but also deeply and comprehensively explore the impact of the development of the technology-driven supply chain finance innovation for the real economy and rural small and micro enterprises. From the research background to the conclusion and suggestion, all show a high degree of professionalism and systematization.

In particular, when discussing the application of alliance chain technology in supply chain finance, the paper expounds its advantages, such as decentralization, high security and scalability, and deeply analyzes its positive impact on supply chain finance through the combination of case analysis and quantitative data analysis. At the same time, the paper also points out the challenges of technological innovation, such as technology maturity, cost input and the lag of laws and regulations, which provides a direction for future research.

The policy suggestions put forward in the paper are also highly targeted and operable, which helps to promote the healthy development of supply chain finance. In particular, the suggestions on strengthening policy support, promoting the formulation and improvement of laws and regulations, encouraging investment in technological innovation and strengthening cross-industry cooperation are of great significance for improving the service quality and efficiency of supply chain finance and promoting the development of new quality productivity. In general, this paper not only enriches the theoretical research results in the field of supply chain finance, but also provides a useful reference for policy making and implementation in practice.

## **6 Outlook of Future Research**

Although this study deeply explores the impact of technology-driven supply chain finance innovation on the development of new quality productivity, there are still many areas and directions that deserve further study.

First of all, with the continuous progress of technology and the rapid development of the market, the application of alliance chain technology in supply chain finance will present more innovative models and business scenarios. Future research can further pay attention to the practical application effect of new technologies in supply chain finance, and explore their potential business model and profit space.

Secondly, although this study expounds the advantages of the alliance chain technology, it does not deeply explore its fusion application with other technologies. Future

research can focus on the combination of alliance chain technology with the Internet of Things, big data, artificial intelligence and other technologies, explore the synergies of these technologies in supply chain finance, and further improve the quality and efficiency of financial services.

In addition, this study mainly focused on the project operation situation, financing effect and risk control in the case analysis, but did not discuss the sustainability of the project in depth. Future research can evaluate and analyze the sustainability of supply chain finance innovation projects from the perspectives of long-term operation, ecological environment and social benefits.

Finally, despite some policy recommendations, this study did not involve specific policy making and implementation processes. Future research can further pay attention to the key links and difficulties in the process of policy formulation and implementation, put forward more targeted and operable policy suggestions, and promote the healthy development of supply chain finance.

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