

Research on the Innovation of Supply Chain Finance of Private Core Enterprises Based on New Technologies

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ABSTRACT: The support of national policies, the theoretical research of supply chain finance, and the application of new technologies ushered in many opportunities for private core enterprises to actively participate in the cooperation and innovation of supply chain finance business. This paper uses SWOT to analyze the strengths and weaknesses, opportunities, and threats of private core enterprises participating in the supply chain finance business. It mainly studies the innovation and practice of private core enterprises in the supply chain financial service platform, product research and development, risk control, and other aspects underpinned by new technologies such as the Internet, blockchain, Internet of Things, and Big Data. It is concluded from the research that it is necessary to accelerate the integrated application of emerging technologies in the supply chain field and speed up the innovation of supply chain financial products, services, management, and risk control; it is imperative to strengthen cooperation and strengthen the risk management of private core enterprises by virtue of commercial banks. Commitment is made to put forward policy suggestions such as market environment construction, digital construction and differentiated supervision and assessment.

Keywords: Private core enterprises; Supply chain finance; SWOT; New technologies

1. INTRODUCTION

China has always attached great importance to the development of supply chain and industrial chain, and encouraged the development and innovation of supply chain finance, and further enhanced its support for supply chain finance. The rapid development of new technologies such as blockchain and the Internet of Things also provides strong support for the innovation and practice of the supply chain finance model and risk control. Weichang Duan et al (2019) summarized the development model of supply chain finance and divided it into five development stages, thought that it is now in the transition stage from 4.0 era (intelligent mode) to 5.0 era (self-finance plus blockchain bill mode) ^[1]. Renhao Liu (2020) held that there is a waste of core enterprise resources in supply chain finance, and put forward a mode of combining asset securitization with accounts receivable financing ^[2]. Jiajia Li et al (2021) combined with typical practical cases such as Haier Group and studied the application mode and risk challenges of supply chain finance based on blockchain ^[3].

The subjects participating in supply chain finance mainly include core enterprises, upstream and downstream small and medium-sized enterprises,

financial institutions, etc. Private core enterprises serve as the most representative and most active important subjects. The implementation of supply chain finance business will help consolidate and enhance the core position of private core enterprises in the supply chain, boost their overall management and control ability over the upstream and downstream of the supply chain, and bolster their industry status and social image; it can also provide richer and more accurate financial services for upstream and downstream small and medium-sized enterprises, solve their financial problems, and enhance the comprehensive competitiveness of the supply chain; it plays a reinforced role on the supply chain and industrial chain, thus promoting the development of private economy and industrial economy. Under domestic policy support, the theoretical research of supply chain finance and the application of new technologies are created for private core enterprises to participate in the cooperation and innovation of the supply chain finance business. Private core enterprises should take advantage of the trend, actively carry out innovation and practice activities of supply chain finance, continuously develop and grow, and enhance their values.

2. ANALYSIS ON THE SUPPLY CHAIN FINANCE OF PRIVATE CORE ENTERPRISES BASED ON SWOT ANALYSIS

2.1. Analysis of strengths (S)

2.1.1. High degree of marketization and a strong sense of competition

Private enterprises have clear property rights. They are at the forefront of the market economy, capable of quickly responding to market changes. Private core enterprises in advantageous industrial chains and supply chains have a strong sense of competition and hardship and cherish their living environment. Many private core enterprises actively take the lead in setting up various industry associations or chambers of commerce and become president-level units with strong industry influence.

2.1.2. Emphasis on the application of new technologies and a strong sense of innovation

The development and application of various new technologies have promoted the continuous updating and iteration of enterprise products and services. Private core enterprises are generally deeply aware of the importance of new technologies for the development of enterprises, and have a strong sense of independent innovation and strong R&D capabilities so that they will invest a lot of R&D resources in product and service innovation according to development needs.

2.1.3. Growing groups of private leading enterprises

China's outstanding private enterprises, represented by Huawei, Haier, Ali, JD.COM, etc., continue to grow and develop, many of which have grown into listed companies and become core enterprises in the supply chain, operating in accordance with the system of modern enterprises and international prevailing rules. In 2020, the total value of Hurun's top 500 private enterprises in China reached 56 trillion yuan, the average market value of enterprises reached 110 billion yuan, and the annual total sales reached 22 trillion yuan, which was 1/5 of China's GDP in that year^[4].

2.2. Analysis of weaknesses (W)

2.2.1. Short operation time and the weak comprehensive strength of the enterprises

The operation time of private core enterprises is generally short. Compared with state-owned core enterprises, private core enterprises are generally small in

scale and weak in hard power such as plants, equipment. However, there are gaps in soft power such as organizational model^[5]. Profitability, service ability, and innovation ability are also the inferiorities of private core enterprises.

2.2.2. Unsound internal control mechanism and weak prevention and control ability for risks

Supply chain financial risk has a strong chain reaction. The longer the chain is, the greater the probability of risk occurrence will be. Private core enterprises often lack professional financial talents and fear of financial risks. For the sake of market and efficiency, the behaviors of internal control mechanisms that exist in name only and evading financial supervision are prone to occurring. If the management and guidance are improper, not only the enterprise itself will have risks, but also the supply chain will be involved, thus causing greater social problems.

2.2.3. No access of private enterprises to some areas

In terms of industrial access and market expansion, China's private enterprises still have not obtained equal treatment and equal competition with state-owned enterprises. Large state-owned enterprises occupy the departments that governments take strict market access and industrial control, while private enterprises are basically open and fully competitive departments^[6]. In the competition of similar supply chains, private core enterprises are in an overwhelmed state.

2.3. Analysis of opportunities (O)

2.3.1. Strong support from national policies

Both the public-owned economy and the non-public-owned economy are important components of China's socialist market economy. Continuing to deepen reform brings new opportunities for the sustained and healthy development of the private economy. The government has successively unveiled a string of relevant policies to support supply chain finance, involving product innovation, system construction, etc., which requires financial institutions to increase support for core enterprises. Admittedly, supply chain finance has become an important measure to alleviate the financing difficulties of small and micro enterprises.

2.3.2. Increasingly matured industrial clusters and supply chains

China has a complete industrial system and remarkable cluster characteristics, and private enterprises account for a very high proportion of industrial clusters and supply chains. Hundreds of typical industrial clusters and supply chains have been formed. China boasts the country with the

richest and most complex industrial chain in the world and is seizing the great opportunity of the new round of scientific and technological revolution and industrial transformation, with a commitment to comprehensively enhance the stability and competitiveness of the industrial chain and supply chain.

2.3.3. The rise of new technologies such as blockchain

Emerging technologies such as blockchain, 5G, the Big Data, are developing rapidly and attracting the attention of governments and enterprises at all levels, and they are integrated, applied, and promoted in related fields of the supply chain such as government departments, intelligent logistics parks, and intelligent warehousing. Some private core enterprises actively invested in the research and development and application of new technologies, and actively promoted new formats such as online procurement, vehicle and cargo matching, which improved the overall adaptability and synergy of the supply chain [7]. In the future, new technologies such as blockchain will bring more development opportunities to supply chain finance.

2.4. Analysis of threats (T)

2.4.1. The safety of the industrial chain being impacted

In today’s world, the trend of anti-globalization is on the rise, and the global supply chain has been severely impacted. Some countries have imposed containment on China and cut off the supply chain of key industries, which has led to pressure on Chinese manufacturing

high-tech enterprises. We should make all kinds of preparations to maintain the safety and stability of China’s industrial chain, and guard against various risks.

2.4.2. Outstanding data fragmentation and monopoly problems

The key of supply chain financial risk control is to build an effective risk control model, since core enterprises and commercial banks have access to complete and effective data in time and accurately. At present, public data such as industry and commerce, justice, taxation, and electricity are generally in a state of cross-sectoral, cross-regional, and cross-level fragmentation, and the progress of interconnection is slow; large-scale financial technology companies, industrial Internet platforms, warehousing, and logistics enterprises, etc. also monopolize and enjoy their own transaction data and industrial data to varying degrees.

2.4.3. Low willingness of commercial banks to cooperate

Due to factors such as risk control concept and actual risk control ability, commercial banks are more willing to serve customers with strong guarantees such as mortgages and pledges, cooperate with state-owned core enterprises in the supply chain, and agree with the credit of state-owned enterprises. There is insufficient motivation to cooperate with private core enterprises, and there are more concerns about issuing weak guarantee loans for small and micro enterprises in the chain. The customer access, risk control requirements, and service methods are stricter, the bad tolerance is low, and the business continuity and stability are poor.

Table 1 SWOT analysis of supply chain finance of private core enterprises

<p style="text-align: center;">Analysis of strengths (S)</p> <ol style="list-style-type: none"> 1. High degree of marketization and a strong sense of competition 2. Emphasis on the application of new technologies and a strong sense of innovation 3. Growing groups of private leading enterprises 	<p style="text-align: center;">Analysis of weaknesses (W)</p> <ol style="list-style-type: none"> 1. Short operation time and the weak comprehensive strength of the enterprises 2. Unsound internal control mechanism and weak prevention and control ability for risks 3. No access of private enterprises to some areas
<p style="text-align: center;">Analysis of opportunities (O)</p> <ol style="list-style-type: none"> 1. Strong support from national policies 2. Increasingly matured industrial clusters and supply chains 3. The rise of new technologies such as blockchain 	<p style="text-align: center;">Analysis of threats (T)</p> <ol style="list-style-type: none"> 1. The safety of the industrial chain being impacted 2. Outstanding data fragmentation and monopoly problems 3. Low willingness of commercial banks to cooperate

3. THE INNOVATION AND PRACTICE OF SUPPLY CHAIN FINANCE OF PRIVATE CORE ENTERPRISES

From the above SWOT analysis, private core enterprises should give full play to their own strengths,

seize development opportunities, actively cooperate with financial institutions, and strive to overcome their own disadvantages and shortcomings. It is essential to take new technologies as the driving force of development, with a focus on strengthening innovation and practice in supply chain financial platform construction, product innovation, and risk control management.

3.1. Relying on the Internet to build a supply chain financial service platform

The development of supply chain finance has its inherent laws and logic, and thus it is necessary to stimulate the enthusiasm and creativity of private core enterprises, commercial banks, and small and micro enterprises with the highest degree of marketization in the

supply chain financial system. Private core enterprises should actively cooperate with commercial banks and other financial institutions, integrate their respective superior resources, rely on the Internet, build and share a comprehensive service platform for supply chain finance, enhance the value of all parties in the development of supply chain. Private core enterprises represented by Haier Group and JD.com Group actively innovated the new supply chain financial service platform of “blockchain + supply chain” and achieved good results.

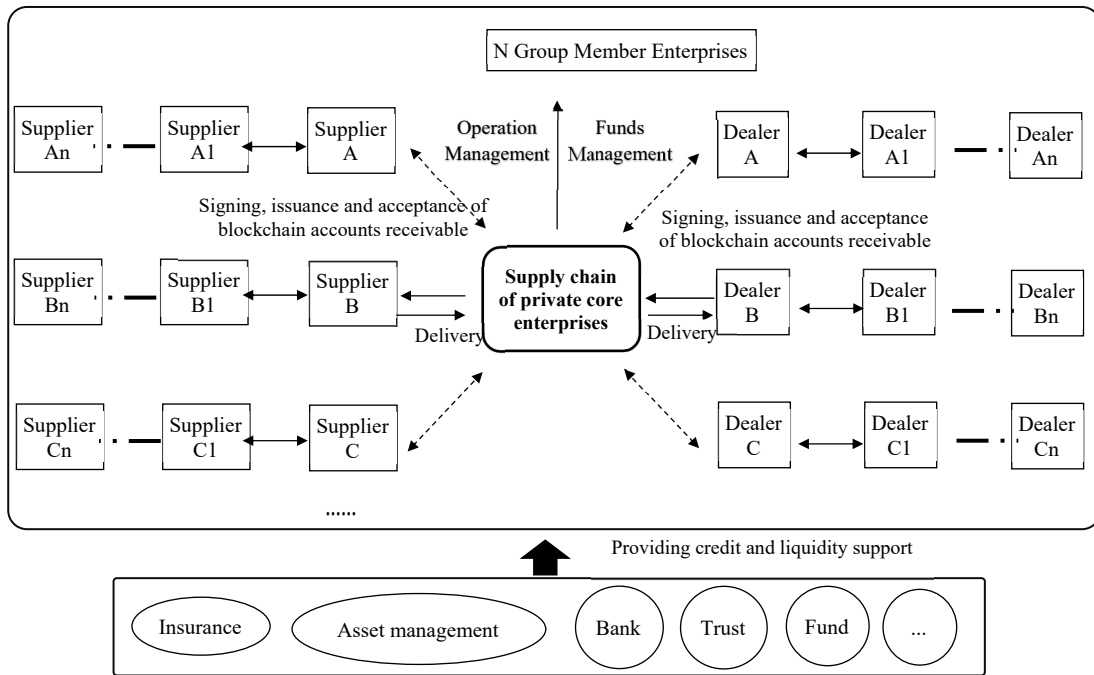


Figure 1 Architecture diagram of supply chain financial service platform

Figure 1 shows a supply chain integrated financial service platform jointly established by a private core enterprise and a commercial bank. The platform has four main characteristics: First, it can provide systematic and comprehensive financial solutions including settlement, financing, and financial management for core enterprises and their upstream and downstream small and medium-sized enterprises, and improve the overall capital flow, credit scale, and financing cost of the supply chain via issuing and accepting blockchain accounts receivable. Second, through platform co-construction and sharing, private core enterprises and commercial banks can realize co-management, co-governance, and co-service of supply chain and supply chain financial business. Third, private core enterprises can carry out unified management and fund management for group member enterprises to achieve a certain degree of enterprise self-financial services; it can manage and optimize the supply chain business circle and enhance the tightness and overall competitiveness of the supply chain. Fourth, standardized and modular development is implemented. The platform can connect with many financial institutions such as banks, insurance, asset management,

and serve many private core enterprises and their upstream and downstream small and medium-sized enterprises.

3.2. Applying blockchain technology and creating blockchain accounts receivable

Blockchain technology can realize the sharing, decentralization, and transparency of data records, ensure the traceability and non-tampering of data, and integrate the real background and real transaction information of enterprises in the supply chain. Blockchain accounts receivable created based on blockchain distributed accounting, intelligent contract, and other technologies [3], form an electronic payment settlement and financing tool to support the circulation of creditors’ rights, which can be used on the supply chain financial service platform. Payment enterprises can issue blockchain accounts receivable to suppliers on the platform, and banks can act as credit enhancement institutions to confirm them within the credit limit. After suppliers receive blockchain accounts receivable, they can pay and transfer them for realization, or apply for pledge financing. Figure 2 shows

a blockchain accounts receivable product jointly developed by a private core enterprise and a commercial

bank, which has the characteristics of reliable technical data, clear rights, active performance, etc.

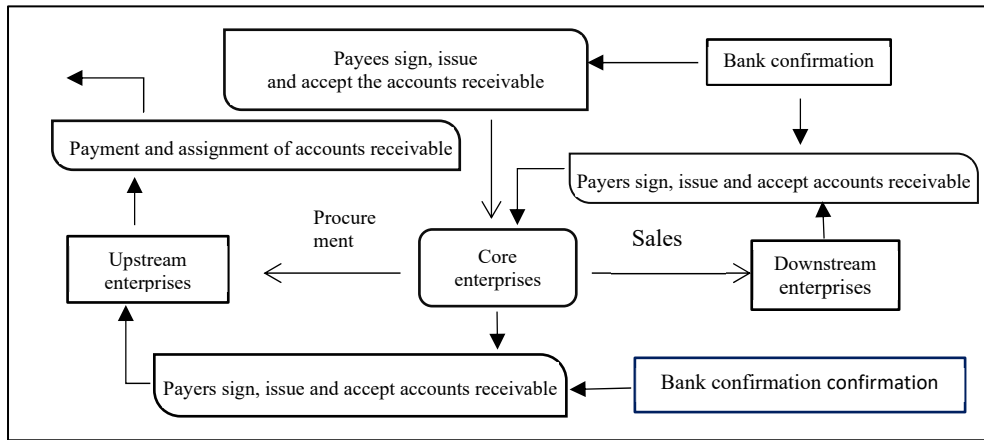


Figure 2 Schematic diagram of blockchain accounts receivable

3.3. Joint financial institutions and innovative asset securitization products

The key to supply chain finance is that credit can be effectively transferred among multiple participants. Relying on the integrated financial service platform of the supply chain, private core enterprises and upstream and downstream enterprises can realize continuous credit circulation and interactive credit appreciation. Approved by commercial banks and private core enterprises, licensed financial institutions such as trust companies, asset management companies and fund management

companies can handle accounts receivable confirmation and transfer in the business circle and can issue public offering or private offering products through asset securitization. Public offering products include asset-backed notes (ABN) issued in the inter-bank market and asset-backed securities (ABS) issued in the exchange market. Relying on the credit of private core enterprises and cooperating with financial institutions, it not only revitalizes the accounts receivable arising from transactions with upstream and downstream small and medium-sized enterprises, but also helps core enterprises expand sales and speed up payment collection [8].

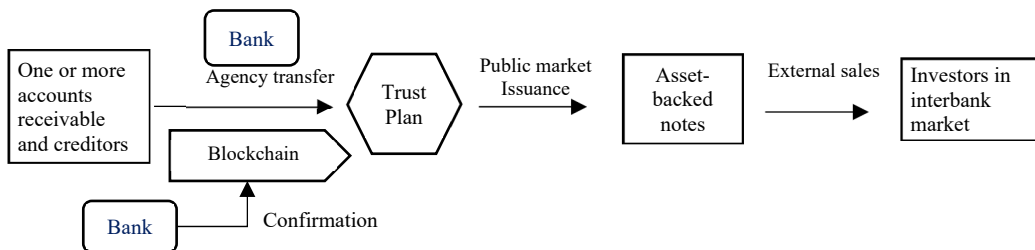


Figure 3 Schematic diagram of ABN process of blockchain accounts receivable

3.4. Applying big data technology and innovating risk control models

The key to supply chain financial services is the risk control mode and the risk control capability. Some private core enterprises gradually transform their own data advantages into strong risk control capabilities through actively using big data technology, striving to collect, clean, analyze and label volume data of Shanghai in their own supply chain, and they actively connect with external data such as PBOC, industry and commerce, taxation, justice, and industry information database. Such

financial institutions as commercial banks are united to develop and continuously optimize the big data risk control model of supply chain finance in line with the characteristics of supply chain operation. The risk control model has been gradually embedded in the whole process of supply chain finance business, providing a batch of online, scenarized and automated financing services for upstream and downstream small and medium-sized enterprises, and realizing effective and accurate allocation of credit funds. Through multi-dimensional big data intelligent risk control technology, are cross-certified.

3.5. Applying the Internet of Things technology to explore the pledge and supervision of movable property

In supply chain finance, there is an urgent need for the pledge and financing of movable property in upstream and downstream small and medium-sized enterprises, but private core enterprises are afraid to guarantee and commercial banks fear to lend. The rapid development of Internet of Things technology is gradually improving this situation. The Internet of Things makes use of sensing, navigation, positioning, and other technologies to visualize warehousing, freight, and other links, and can track and monitor the whole supply chain in real time. Through the application of Internet of Things technology, some private core enterprises have optimized the management of the supply chain, effectively solved the problems of movable property supervision, false warehouse receipts, repeated mortgages, etc., which reduced the management costs and risks of core enterprises and banks, and reduced the financing difficulties and costs of small and medium-sized enterprises in the chain. The Internet of Things technology has also been applied in modern agriculture and animal husbandry supply chain finance. In the supply chain financial cooperation between a private dairy core enterprise and banks, by installing intelligent ear tags, foot rings, and other terminal detection equipment for dairy cows, and using wireless communication technology to monitor dairy cows in vivo, the management of statistics, screening and tracking of dairy cows was realized [9], and dairy cows were used as collaterals to provide guarantee for upstream dairy farmers' loans, which achieved good results.

4. CONCLUSIONS

From the above research, the opportunities for private core enterprises to develop supply chain finance business outweigh the threats. Especially, the development and application of new technologies have created favorable conditions for them. The innovation and practice of some outstanding private core enterprises in supply chain financial platform construction, product innovation, and risk control management prove that new technologies will accelerate the development of the supply chain financial business of private core enterprises. It is needed to boost the cooperation, strengthen the risk management of private core enterprises with the help of commercial banks, and enhance the intelligent risk control capacity construction of the whole supply chain. In order to create a better policy environment, three policy suggestions are put forward. First, it is imperative to strengthen the construction of the market environment and give private enterprises an equal market position. Private enterprises and state-owned enterprises should be given an equal competitive position in terms of industrial access, market expansion, and financial services so that high-quality

private core enterprises can participate in the supply chain, industrial chain competition, and supply chain financial business cooperation on an equal footing, and give full play to the decisive role of the market in resource allocation. Second, strengthening digital construction and guaranteeing the right of private enterprises is the essential way to obtain information services. Commitment is made to build a supply chain financial digital information service platform, integrate all kinds of public data and industrial data in an orderly manner, establish and improve a cross-regional, cross-departmental, and cross-level data fusion and utilization mechanism, thus breaking the monopoly of data information. Third, it is required to strengthen the financial supervision and support and formulate differentiated assessment policies. It is quite important to guide private core enterprises to increase investment in supply chain finance through supervision and assessment and guide commercial banks to increase support for private core enterprises to jointly serve upstream and downstream small and medium-sized enterprises. In the assessment of commercial banks, the number of financing households and financing costs of small and medium-sized enterprises in the supply chain should be increased, and private core enterprises should be provided with special financing quotas and special loan interest rate preferential policies.

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