Optimization Method of Supply Chain Financial Credit Risk System based on Computer-Aided Technology

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Abstract: This article focuses on the conceptual theory, technical path and existing research results of applying computer technology to supply chain financial risk control. Attempts to improve the level of financial risk control by strengthening the application of financial information technology in supply chain financial risk management and control. Through case analysis, the article sorts out the current situation of the use of computers in risk control in the supply chain finance industry, and demonstrates some points of view. In the second bedroom, the research puts forward the difficulties and challenges in applying computer technology to the financial risk control of the supply chain, and puts forward corresponding solutions based on the existing foundation. The significance of this article is systematically reviewed the development process of computer technology applied to supply chain financial risk control. Specifically, financial institutions have implemented optimized operation methods such as intelligent credit decision-making and visualized post-loan management in the risk control of supply chain finance, which greatly improved the ability of financial risk prevention and control, and realized the purpose of technology to help finance and finance to promote industrial development.

Keywords: Computer technology; supply chain finance; risk control; financial technology
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1 INTRODUCTION

As a supporting field of industrial financial services, supply chain finance has developed rapidly in recent years. The problem of financing difficulties for small, medium and micro enterprises is a key content of the financial supply-side reform and financial services that the Chinese government has focused on in recent years. On the one hand, as a "bridge" between the financial system and the main body of industrial development, supply chain finance can effectively alleviate the financing difficulties of small and medium-sized enterprises in the upstream and downstream of the industrial chain. At present, financial institutions have encountered many uncertainties in the management and control of supply chain financial risks. These problems are difficult to effectively solve through traditional risk control methods, which makes it difficult to effectively carry out supply chain financial services. In recent years, with the vigorous development of emerging information technologies, diversified technical methods have been rapidly applied and promoted in the financial field. In particular, the use of emerging technologies represented by big data, block chain, cloud computing, block chain and artificial intelligence has promoted the rapid upgrade of traditional supply chains and jointly created a smart supply chain system. On the other hand, through the application of financial information technology, financial institutions have strengthened the overall management and control capabilities of information flow, capital flow and logistics in the supply chain financial business. It focused on solving the problems of information asymmetry, inventory pledge supervision, and trade authenticity in the supply chain system and a certain extent alleviated the problem that the financial risks of the supply chain are difficult to effectively control. The development of supply chain finance business has been facing many problems. Supply chain finance has different risk characteristics from other financial credit products. In the risk control of supply chain finance, issues such as inventory dynamic supervision and order authenticity confirmation have always been difficult problems that plague financial institutions. Financial institutions have always been unable to effectively solve the problem of dynamic control of financial risks in the supply chain. In practical cases, there are often cases of repeated pledge of collateral, or insufficient collateral, or shoddy items, and even financial institution business personnel for personal benefit, colluding with companies, using their powers and conveniences to assist companies in forging trade-related materials to obtain financing by fraud, restricting the sound development of supply chain finance development of. At present, there have been many studies on the combination of computer technology and supply chain financial risk control. However, research mainly focuses on the use of a specific financial information technology in the prevention and control of supply chain financial risks, and lacks more thinking about the integrated use of technologies in different scenarios. Considering that different technology types correspond to different links in the financial risk control of the supply chain, this article believes that relatively mature

This article focuses on the conceptual theory, technical path and existing research results of applying computer technology to supply chain financial risk control. Attempts to improve the level of financial risk control by strengthening the application of financial information technology in supply chain financial risk management and control. Through case analysis, the article sorts out the current situation of the use of computers in risk control in the supply chain finance industry, and demonstrates some points of view. In the second bedroom, the research puts forward the difficulties and challenges in applying computer technology to the financial risk control of the supply chain, and puts forward corresponding solutions based on the existing foundation. The significance of this article is systematically reviewed the development process of computer technology applied to supply chain financial risk control. Specifically, financial institutions have implemented optimized operation methods such as intelligent credit decision-making and visualized post-loan management in the risk control of supply chain finance, which greatly improved the ability of financial risk prevention and control, and realized the purpose of technology to help finance and finance to promote industrial development.

2 RELATED STUDIES

Big data Tec has promoted the sound development of financial technology. From the perspective of risk control, Chen and Wang [1] believe that big data technology can improve the ability of financial institutions to control risk, and that big data technology has some extent subverted traditional financial institutions' methods of risk identification, risk warning, and risk disposal. Big data provides intelligent support for financial institutions to make risk judgments through different channels of information collection and dynamic data acquisition, and improves the problem of information asymmetry and slow information transmission speed in traditional risk control. Financial institutions on the one hand it is possible to synthesize different information of the enterprise in the credit phase to form a judgment on the enterprise and grant a credit line. In addition, Ranscombe et al. [2] believe that in post-loan management, it is also possible to dynamically obtain enterprise information, and use IoT technology and block chain technology to obtain enterprise logistics and information flow data for post-loan supervision. Provide timely and efficient decision support. As an interdisciplinary comprehensive technology, artificial intelligence technology provides intelligent development assistance for finance. Artificial intelligence is widely used in finance, and it often cooperates with other financial technology technologies to provide support for financial services, such as artificial intelligence. Intelligent crawler technology provides data source support for big data technology, and big data technology combined with artificial intelligence algorithms in credit granting to provide intelligent decision support. In financial business, artificial intelligence technology applied to businesses including asset management, financial credit extension, and financial investment. Artificial intelligence machine learning, visual technology, natural language processing technology, etc., all play a huge role in financial risk control. Solving the problems in traditional financial risk control has positive help.

This article divides the participants in the supply chain finance business into three functional categories: The first type is the fund provider of the supply chain finance business: including banks, small loan companies and other credit institutions, as well as their own supply chain finance business. The second category is the capital demand side of the supply chain financial business, specifically focusing on the upstream and downstream customers of the core enterprise to provide services. The third category is the intermediary agencies in the supply chain financial business, including investors and funds in the supply chain financial business. The demand side is similar to intermediary agencies, which divided into Internet platforms for supply chain finance construction financial technology companies that provide financial technology services, logistics companies that provide cargo supervision, and other service providers based on the content of intermediary companies in Figure 1.

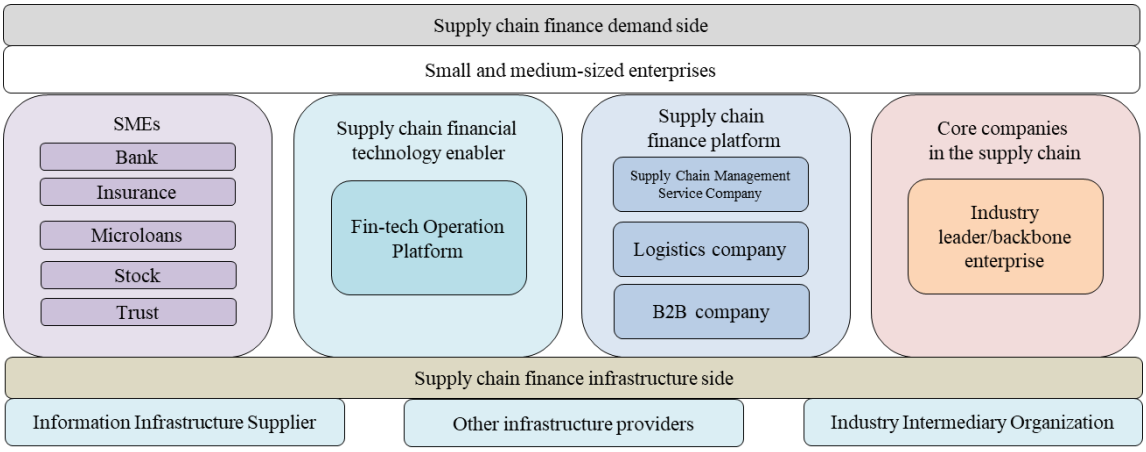

Figure 1: Supply Chain Finance Participants Organization Model.

As Lee [3] thought the cloud computing is complementary to big data technology. Cloud computing technology solves the storage and calculation problem of massive data and provides support for the application of big data. Cloud computing has three service modes: IaaS, PaaS and SaaS. Key technologies include virtualization, parallel computing, distributed storage, and cloud platform technology. Cloud computing provides support for financial services through massive data storage and efficient response. At the same time, Mosch et al. [4] believe that it is based on the Hadoop platform. , Financial institutions can make full use of big data technology to analyze and extract valuable data from massive amounts of information to provide support for financial institutions' risk decision-making.

As an interdisciplinary comprehensive technology, artificial intelligence technology provides intelligent development assistance for finance. Artificial intelligence is widely used in finance, and Xbm et al. [5] believe it often used in collaboration with other financial technology technologies to provide support for financial services, such as artificial intelligence. Intelligent crawler technology provides data source support for big data technology, and big data technology is also combined with artificial intelligence algorithms in credit granting to provide intelligent decision support. In financial business, artificial intelligence technology has been applied to businesses including asset management, financial credit extension, and financial investment. Hahn et al. [6] believe artificial intelligence machine learning, visual technology, natural language processing technology, etc., all play a huge role in financial risk control. Solving the problems in traditional financial risk control has positive help

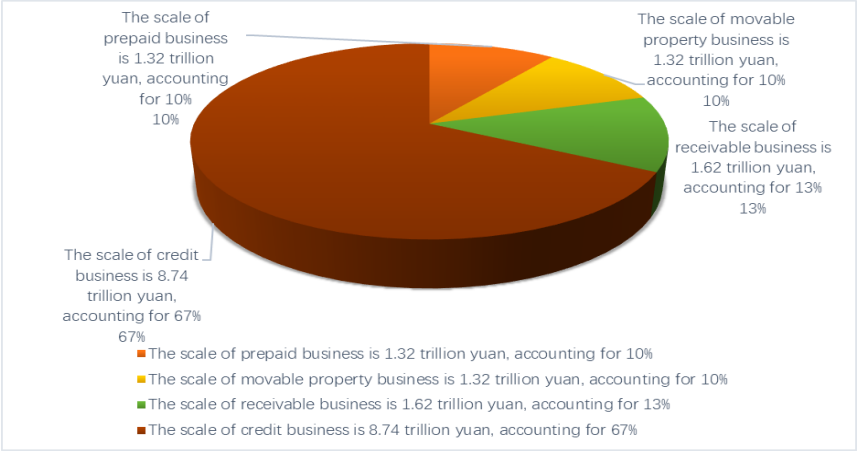

Figure 2: Financial business scale of different types of supply chains.

As can be seen from the above Figure 2, in the entire supply chain financial business product composition, prepaid, movable property and receivable supply chain financial products account for 33% of the entire supply chain financial scale, and credit accounts for 67%, as the author said. , Credit-type supply chain financial products cannot actually regarded as supply chain financial products in the strict sense, but are reflected in the splitting of the credit of core enterprises. Therefore, it can be seen that the other three types of supply chain financial services in the real sense have huge growth potential.

This article introduces the application of various fin-tech technologies in supply chain financial risk control, supplemented by practical cases, and provides theoretical support and case guidance for financial service providers in the supply chain to apply fin-tech for risk control. The author focuses on the analysis Current supply chain financial risk control is facing challenges in the

application of financial technology, and corresponding countermeasures are given to provide supply chain financial service providers when applying financial technology to supply chain financial risk control and regulatory agencies to supervise financial technology. , Provides ideas and frameworks, in order to jointly promote the better development of financial technology in the field of supply chain financial risk control through the efforts of multiple parties. · ·

Artificial intelligence technology is a new technological science that researches, develops and applies the theory, method, and technology, which used in application system of simulation and expansion of human intelligence. Sun et al. [7] can popularly define artificial intelligence as training a computer system to simulate human intelligence activities and complete tasks that can only be done by human intelligence. At present, artificial intelligence has been applied in many fields, including medicine, biology, geology, geophysics, aviation, electronics and other fields. The technical layer of artificial intelligence consists of three parts: the underlying framework, algorithms, and general technologies. Each department involves more technology collections. The application of financial technology in supply chain financial risk control is the infrastructure of the artificial intelligence technology layer, including Tensor Flow, Caffe, Torch, Ros and other technologies; the algorithm layer mainly includes popular technologies such as machine learning, knowledge engineering, neuron models, intelligent databases, deep learning, and convolutional neural algorithms. The general technology layer includes speech recognition, natural language understanding, and image recognition. Intelligent control, expert systems, computer-aided design, robotics, automatic programming and pattern recognition, sensor fusion, and other technologies that can be directly applied by humans. The following Figure 3 shows the artificial intelligence that is commonly used in the market and can be applied to supply chain financial risk control Brief introduction of technology:

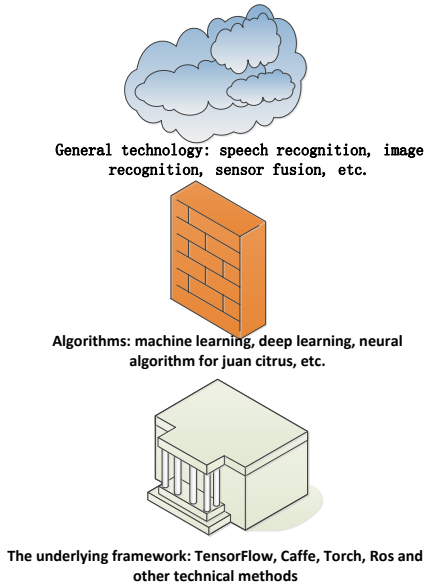

Figure 3: Artificial intelligence technology level.

3 APPLICATION STATUS OF COMPUTER TECHNOLOGY IN SUPPLY CHAIN FINANCIAL RISK CONTROL

3.1 The Connection Between Financial Technologies

There are close connections between different financial technology technologies. Liu Feng proposed that "the future functions and structure of the Internet will be highly similar to the human brain, and it will also have Internet Virtual sensation, virtual movement, virtual center, virtual memory and nervous system" in "Internet Evolution" (published by Tsinghua University Press in September 2012). The Internet of Things technology provides support for the brain's virtual auditory system, virtual visual system, sensory system, and motion system. The International Telecommunication Union believes that "all objects in the world can actively exchange information through the Internet, realizing any time, any place, and any object. The Internet of Things is based on radio frequency identification technology (RFID), combined with existing smart technology, sensor technology, nanotechnology, etc., trying to build a "things-connected" network. Massive data obtained from the Internet of Things technology, traditional Internet, and mobile Internet constitutes the Internet information layer. Due to the huge amount of data, traditional processing methods cannot effectively process these large amounts of data gathered in real time from the Internet of Things, traditional Internet, and mobile Internet. This requires the support of cloud computing. Cloud computing adopts distributed computing methods. Through cloud storage, virtualization, Hadoop, and container technologies, it breaks through the limitations of the original single physical machine and effectively integrates and uses physical resources to gain computing power. A qualitative improvement.

Big data requires cloud computing. Cloud computing has powerful computing capabilities, but it can effectively generate value, propose the value of data, and provide help for humans or require various algorithms. Big data provides data support for artificial intelligence, and the middle is through use Cloud computing data provides technical support, and the algorithm in cloud computing is the role of artificial intelligence. It can be seen that big data cannot be separated from artificial intelligence; otherwise, data cannot reflect value, the same. Artificial intelligence is also inseparable from big data, because data is the foundation of artificial intelligence in Figure 4.

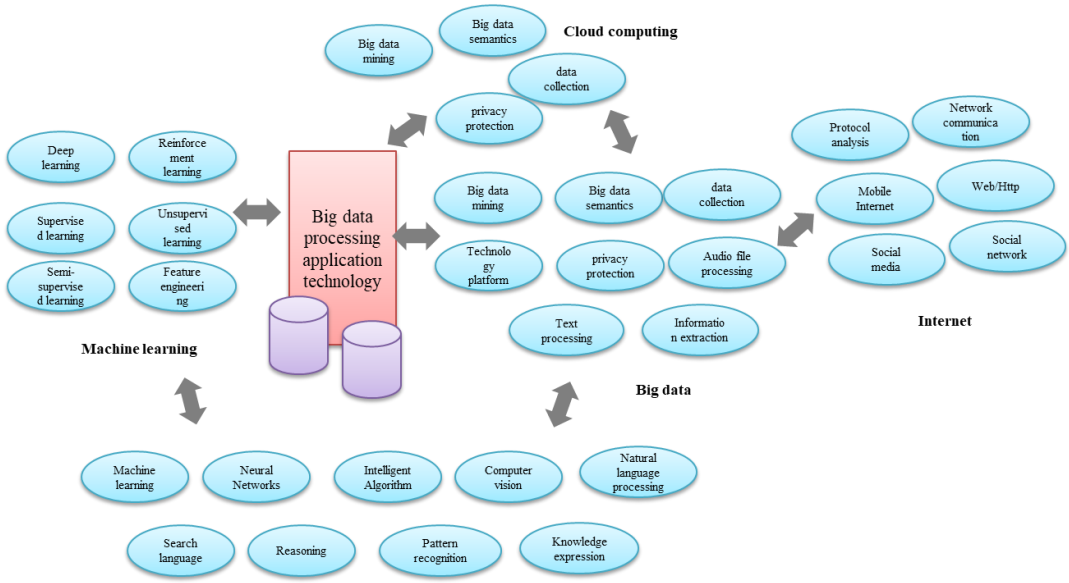

Figure 4: Interconnections between different financial technologies.

3.2 The Current Situation of the Role of Computer Technology in the Financial Risk Control System of the Supply Chain

The development of financial technology requires scenarios, and supply chain finance favored by financial technology with its scenario-based financial attributes. According to the "Technical Trends of Supply Chain Financial Services in 2018" report, among the more than 490 institutions studied, more than 30% use big data and artificial intelligence for risk control, and 30% of enterprises use cloud technology and Internet of Things technology. , The application of block chain technology is also close to one-third, 27%. It showed from the data provided by the surveyed companies that the application rate of fin-tech technology in supply chain financial risk control is relatively high. Preeti et al. [8] surveyed and studied the interviewed companies and indicated that fin-tech strengthened. Applications. It showed that institutions currently engaged in supply chain financial services are generally actively promoting the application of financial technology in supply chain financial risk control. Among them, big data, cloud technology, Internet of Things, block chain and artificial intelligence technology are the most widely used in Figure 5.

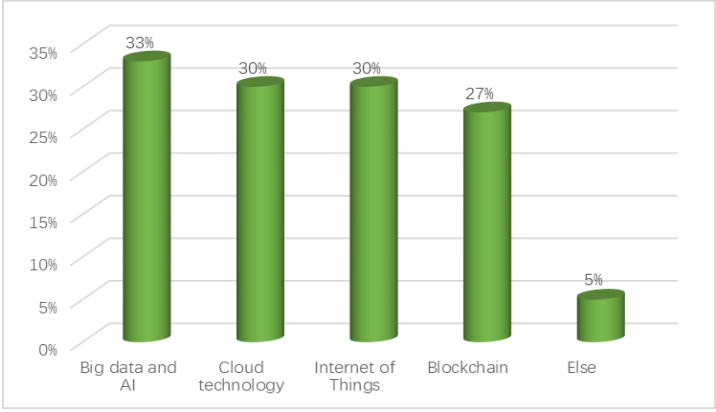

Figure 5: Statistics on the application of financial technology in supply chain financial service organizations.

It can be seen from the enterprise interview survey that the application rate of big data and artificial intelligence technology in the risk control of small loan companies has reached 100%. The second is the application of Internet of Things technology, which accounts for more than 30% of the microfinance industry. For fin-tech companies, e-commerce platforms and banks in the risk control of supply chain finance, fin-tech companies have the highest use rate of computer technology. Gonzalo et al. [9] found through research that the use rate of block chain technology in financial technology companies is twice that of the other two types of institutions. The use of computer technology by e-commerce platforms and commercial banks are same in Figure 6.

4 APPLICATION CASES OF COMPUTER TECHNOLOGY IN COMMERCIAL BANKS

4.1 Application of Financial Risk Control Financial Information Technology in Minsheng Bank Supply Chain

As a joint-stock commercial bank, Minsheng Bank has been following a path of distinctive development in market competition. Dong et al. [10] believed supply chain finance is the key business focus of Minsheng Bank. Minsheng Bank provides extended financial services around core enterprises to provide upstream and downstream customers of core enterprises. Carry out batches of credit business. Through the development of key industries, selection of core customers, and batch development of supply chain finance.

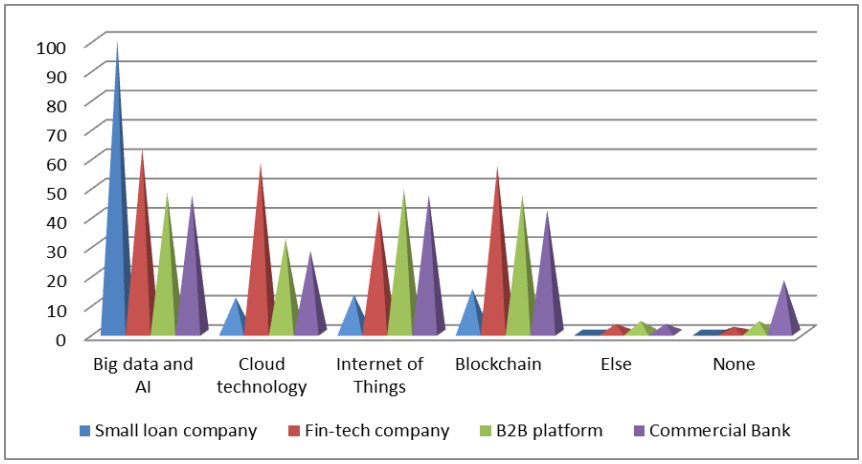

Figure 6: Application of computer technology in different supply chain financial service organizations.

In addition, Minsheng Bank has been at the forefront of the banking industry in using technology to empower supply chain finance. The "E-finance platform" built by Minsheng Bank is the successful practice of Minsheng Bank using technology. Minsheng Bank's supply chain financial products are classified into prepaid financing, inventory (mortgage) financing, receivable finance and prepaid/receivable and inventory combination products. Minsheng Bank's supply chain financial products have a complete range, covering the entire Supply chain process.

The "electronic financial platform" of Minsheng Bank comprehensively uses financial technology technologies such as big data, the Internet of Things, remote video, electronic fences, and smart tracking. Through the online construction of the supply chain business, the bank directly uses digital means to connect the data transmission channel between the bank and the enterprise. In this way, customers' offline paper-based operations can be reduced, and a series of tasks such as online account opening, online contracting, and online lending can be realized, thereby improving work efficiency. In addition, Minsheng Bank vigorously promotes the management and construction of a professional pooling model to provide corresponding support for companies to revitalize their current assets. The pooling model management of receivables, bills, and cash has provided customers with convenient financial financing services and convenient payments in Figure 7.

The "E-Financial Platform" has changed the offline interaction and paper document transmission between traditional banks and supply chain companies and third-party organizations. While the efficiency of financial services has greatly improved, it also monitors transactions through technological means. Scenario support provided through the Internet connection, electronic signature, electronic contract and other technological means. At the same time through the direct connection with the core enterprise system, the transaction information data related to financing also obtained.

Minsheng Bank uses industry data as its benchmark parameters on the "E-Financial Platform" and uses big data and artificial intelligence to establish a risk assessment model based on historical transaction data. Data analysis carried out through big data technology and AI technology to form risk assessment results and intelligent credit reference. Customer historical data and dynamic operation data used as the basis for dynamic adjustment of credit lines, which effectively meets the actual business needs of customers in Figure 8.

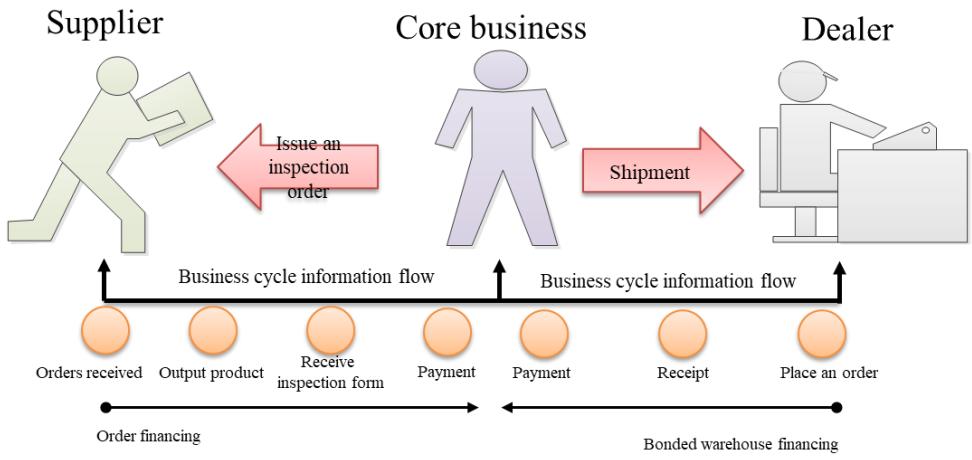

Figure 7: China Minsheng Bank's financial products in the supply chain process.

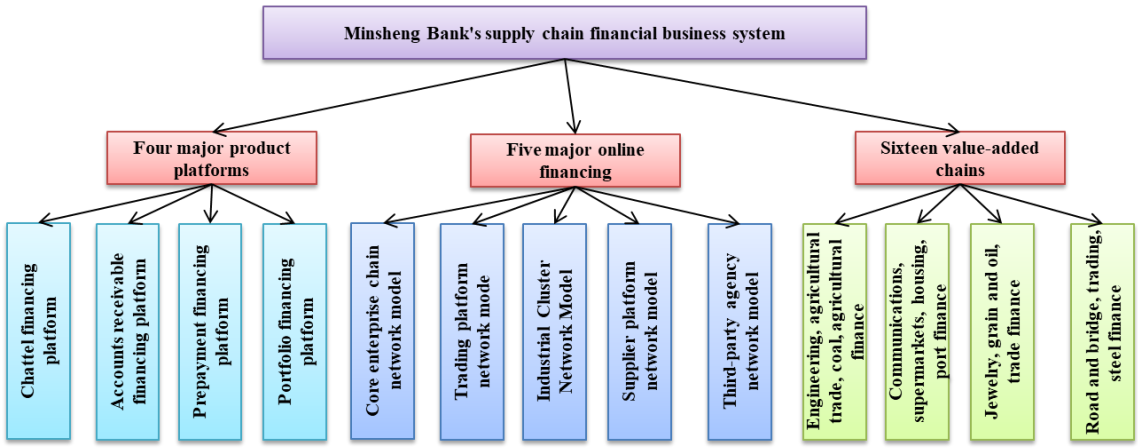

Figure 8: Minsheng Bank Supply Chain Financial Product System.

"E Finance Platform" uses an intelligent credit analysis system to improve the efficiency of risk identification and early warning. The establishment of an intelligent credit analysis system through a diversified data source and a cross-validation mechanism of multi-dimensional data can carry out dynamic data management during the entire transaction process of the supply chain business. The rating of the intelligent credit analysis system can comprehensively reflect the business capabilities, management capabilities, industry status, service quality and credit status of enterprises in the supply chain. Minsheng Bank established a risk credit rating model through big data technology and formulated the "E" series of standardized products. Based on the unconditional payment responsibility of core enterprises and the evaluation results of the big data risk model, it optimized the credit business, effectively controlled risks, and promoted the development of its business.

4.2 Application Strategy of Computer Technology in Supply Chain Finance Risk Control System

Computer financial technology has epoch-making significance for improving the risk control level of supply chain finance. Computer financial technology promotes the risk control of supply chain finance to be more efficient, more accurate, and more continuous. The benefits from big data technology and Internet of Things technology and artificial intelligence technology is embedded in the financial risk control of the supply chain, and the supply chain finance is truly and effectively integrated with the entire commodity transaction process, so that finance can return to the entity. However, the application of computer financial technology has not been smooth sailing. In the previous chapter, the author summarized the challenges of computer financial technology in the application of supply chain financial risk control from different levels in Figure 9.

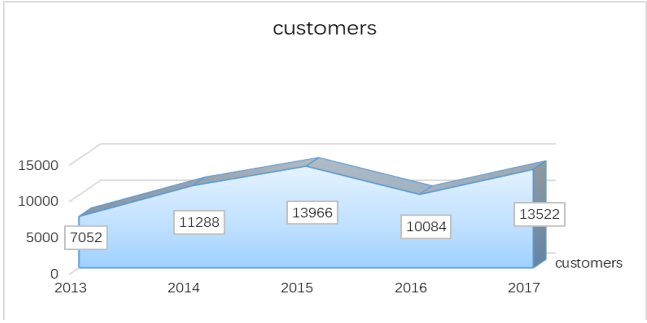

Figure 9: The customers of Minsheng Bank's supply chain finance business in the past 5 years.

At the national level, the sound development of computer financial technology can be applied to supply chain financial risk control. Computer financial technology is still in its infancy. For the development of computer financial technology, we needed most is the development of computer financial technology at the national level. The overall planning and layout, the top-level design of computer financial technology related technologies, such as big data, block chain, Internet of Things, cloud computing and artificial intelligence technology, will be upgraded to the national level, and the time will be well arranged. Key technology breakthroughs and applications provided the key support.

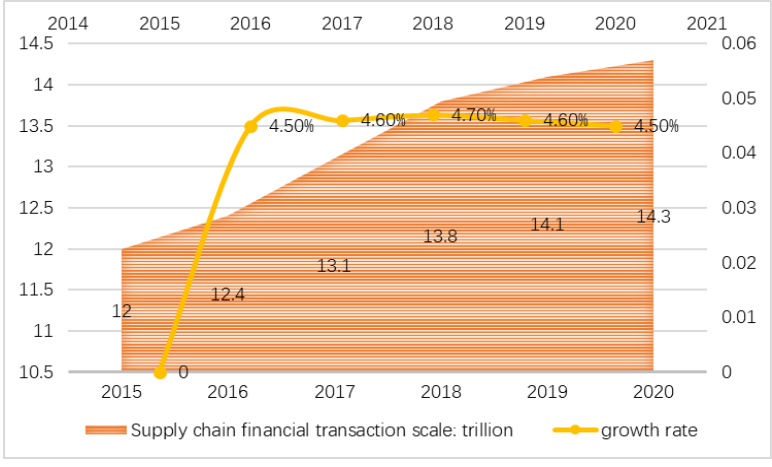

Figure 10: 2015-2020 China's supply chain financial market space scale and forecast.

From an enterprise perspective, financial institutions and computer financial technology companies should formulate reasonable strategic plans based on the needs of supply chain financial risk control. On this basis, through the development and application of computer financial technology, we can solve the problems and needs encountered in actual business, and continue to iterate and upgrade to achieve the improvement of product functions. Therefore, financial institutions must do a good job. The strategic planning of applying computer financial technology in financial risk control. Computer financial technology will not be like similar information construction. After a period of investment, you can enjoy the results. Computer financial technology may be invested for a period, but it will not produce too much. There are many end-point results, but this kind of continuous investment and development, through continuous accumulation, will produce qualitative changes, and subvert the traditional supply chain finance, especially the intermediary characteristics of finance. In addition, the technology itself is to provide support for the actual business. Only by doing a good job of strategic planning and clarifying the financial support and human support in the strategy can we ensure that technological development can meet actual business needs in Figure 10.

5 CONCLUSION

The following conclusions can be drawn through the research of this article: (1) The rapid development of computer financial technology, the comprehensive application of computer financial technology has extremely important value in improving the financial risk control capacity of the supply chain, and the empowerment of computer finance has realized the development of financial institutions. The control over the supply chain in the supply chain finance business allows the "four streams" of the supply chain visualized in front of financial institutions, which can solve the traditional supply chain financial risk control problem and has a positive meaning, and the computer finance is still in its infancy. With the in-depth development of computer financial technology, the integration with supply chain financial risk control will be further deepened; (2) At this stage, financial institutions, technical service providers, core enterprises and other supply chain financial participants are in the supply chain financial risk Computer finance is actively used in control. Through cases, we can see that financial institutions, computer finance companies, etc. have applied computer finance to supply chain financial risk control, and have achieved good results. Different institutions carry out supply based on their own business characteristics. Chain finance business, through the empowerment of computer finance, has improved their respective supply chain financial risk control capabilities; (3) the development prospects of computer finance are bright, but it still faces many challenges. These problems could be explained from four perspectives. From the technical perspective, the security, stability and integration issues of computer finance are still severe. From the perspective of chain finance participants, the application of computer finance faces challenges in terms of organizational pressure, knowledge update, departmental coordination, and continuous investment; in addition, Computer finance also faces the challenges of legal supervision and the potential for some financial firms.

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