ISSN: 2688-9323

Research on the Problems and Countermeasures of Supply Chain Financial Credit Risk Management of Financial Institutions in China

Xiaoyu Liu[1,*], Dingqing Li[2], Yuan Qin[3]

[1]School of International Business, University of International Business and Economics, Beijing 100029, China

[2]School of Accounting, Chongqing Technology and Business University, Chongqing 400067, China

[3]Graduate School, Chinese Academy of Fiscal Sciences, Beijing 100142, China

Abstract

The Fifth Plenary Session of the 19th Central Committee of the Communist Party of China regards financial risk prevention as one of the major propositions to promote the high-quality development of the financial industry in the 14th Five Year Plan period. Supply chain finance is a powerful way to ease and solve the financing channels of small and medium-sized enterprises in recent years. While its business is expanding, it also brings credit risk problems that can not be ignored.How to manage it scientifically and effectively has become an urgent issue. From the perspective of financial institutions dominated by commercial banks, this paper analyzes the existing difficulties of supply chain financial credit risk management.According to the classical comprehensive risk management theory, combined with the supply chain financial credit risk transmission mechanism in practice, this paper constructs the supply chain financial credit transmission and risk management integration framework, and finally puts forward the targeted management measures. In short, this paper attempts to make a deep analysis and carding based on the existing supply chain finance practice, and puts forward a forward-looking research on how to effectively prevent and systematically manage the credit risk of supply chain finance in the future.

Keywords

Supply Chain Finance; Supply Chain Financial Credit Risk Transmission; Managing the Credit Risk of Supply Chain Finance.

1. Introduction

Since the second half of 2020, the meeting of the Standing Committee of the Political Bureau of the CPC Central Committee has proposed to speed up the construction of a new economic development pattern promoted by domestic and international double circulation under the environment of complex political situation and intensified economic downturn risks.As an important part of the market economy, supply chain economy is not only an important channel for the development of new economy, but also a feasible countermeasure for SMEs to normalize COVID-19's financing obstacles. At the same time, the continuous growth and expansion of supply chain economy also put forward higher demand and challenges for supply chain finance, which promotes the gradual reform and innovation of supply chain finance.

At present, the development of supply chain finance is strong, but there are many difficulties and obstacles. According to the statistics of the National Bureau of statistics, the scale of the supply chain financial market increased from 13.05 trillion in 2018 to 14.31 trillion in 2019,

ISSN: 2688-9323

with a growth rate of about 9.7%.In this context, a large number of commercial banks are involved in the field of supply chain finance business and services, and the supply chain finance events caused by credit default of supply chain finance participating enterprises are becoming more and more serious, such as Noah wealth, Fujian Minxing pharmaceutical, Shanghai steel trade incident, Qingdao port incident, etc Dalian machine tool incident makes commercial banks face the adverse situation of supply chain financial credit risk surge under the new economic development pattern.In addition, on September 22, 2020, the people's Bank of China, together with eight major departments, issued the opinions on standardizing the development of supply chain finance and supporting the stable circulation and optimization and upgrading of supply chain industry chain, emphasizing the need to steadily promote the standardized development of supply chain finance, strengthen financial supervision, and strengthen the prevention and control of supply chain financial credit risk.

How to effectively analyze and control the credit risk of supply chain finance and how to carry out the supply chain finance business safely have become the key issues to be explored in theoretical research and policy-making.Most of the existing literatures focus on the concept definition [1], risk control and early warning model [2], credit risk source [3], risk index system [4], credit risk identification [5], credit risk assessment [6], risk evolution mechanism [7]and other perspectives to carry out the research on credit risk of supply chain finance, while less on credit risk management based on the perspective of credit risk transmission mechanism.In view of this, based on the comprehensive risk management theory, this paper focuses on the risk source, risk carrier and risk transmission path of supply chain financial credit risk transmission to study the difficulties and deficiencies of credit risk management, In order to further improve and enrich the academic literature, this paper provides reference countermeasures for financial institutions to strengthen the quality management of supply chain financial credit risk.

2. Analysis on the Difficulties of Credit Risk Management of Supply Chain Finance in China

2.1. The Hidden Trouble of Credit Risk Transmission is Identified, and the Whole Chain Credit Risk is not Covered by Risk Control

In the environment of deep integration and rapid development of Internet economy and supply chain finance, compared with the early traditional supply chain finance, the supply chain finance in the new era has solved the financing constraints of small and medium-sized enterprises to a certain extent, but the new hidden danger of credit risk transmission and diffusion in the chain is gradually prominent, and this problem needs to be solved urgently.In the early stage, the number of participants in the supply chain was small, mainly large and medium-sized enterprises, and the structure, source and prevention of credit risk were relatively simple.However, there are many participants in supply chain finance under the Internet, including core backbone enterprises, small and medium-sized enterprises, financial institutions, logistics service providers, financial technology operation platforms, capital investment institutions, etc., which makes the uncertainty caused by credit problems face geometric growth due to the increase of supply chain connection and the number of participants, and the potential credit risk is doubled, And accelerate the transmission layer by layer, may induce the whole supply chain crisis or even paralysis.In addition, although the existing supply chain financial credit risk control has achieved certain results, its evaluation, measurement and monitoring measures are difficult to systematically reflect the comprehensive credit risk faced by the whole chain. Most of the existing research and literature are based on the perspective of long tail customers in the chain, using empirical means to select quantitative indicators to evaluate and measure the supply chain financial credit risk, and

ISSN: 2688-9323

paying less attention to qualitative indicators [8], As a result, the credit risk of the whole chain is not fully covered by the existing risk control system, which eventually makes it difficult for financial institutions to achieve the expected risk control effect in the process of supply chain financial credit risk management, and the new characteristics of credit risk transmission and diffusion aggravate the secondary damage of credit risk.

2.2. The Credit Risk Analysis of the Whole Chain System is Limited, and the Information Asymmetry Barrier between Banks and Enterprises Needs to be Broken

With the development of the business model of supply chain finance, supply chain finance has evolved from the traditional single chain model to a more complex network supply chain model. Due to this change, financial institutions will face a large number of small and medium-sized micro enterprises, and the analysis of credit risk in the whole chain system is limited. However, small and medium-sized micro enterprises are limited to their natural disadvantages, such as weak strength, opaque business data, and unstable sustainability. When they are attacked by internal and external risks, they may adopt adverse selection and credit default, and follow-up false information, moral hazard, adverse selection, and so on Joint fraud and other possible supply chain credit risk will increase.

Therefore, many participants and adverse selection lead to the formation of information asymmetry barriers between banks and enterprises, which makes it difficult for financial institutions to accurately obtain, screen and judge the real credit information of SMEs [9]. secondly. Supply chain finance can effectively solve the financing constraints of small, medium and micro enterprises. The important link lies in the fact that the capital suppliers rely on the operational strength and credit rating of the core enterprises in the chain to complete the credit injection of small, medium and micro enterprises. However, in reality, it is difficult for the core enterprises to penetrate their own credit into the whole supply chain, that is, their credit is not enough to increase the credit of the long tail small, medium and micro enterprises, Limited by the large number of analysis subjects, it is difficult for financial institutions to deeply control the supply chain financial credit risk of the whole chain subjects, which further aggravates the difficulties and pain points of information asymmetry between banks and enterprises.

2.3. The Reserve of Intelligent Evaluation Financial Talents is Insufficient, and the Human Investment in Big Data Risk Control is Still Weak

Supply chain finance is a powerful tool to relieve the financing difficulties and pain points of small and medium-sized enterprises, and its related products and business models continue to bring forth new ones. In this context, emerging technologies such as big data, cloud computing, artificial intelligence and blockchain continue to optimize the service efficiency and effect of supply chain finance.In the era of digital economy, financial institutions are faced with severe challenges such as high customer acquisition cost, difficult to distinguish financial operation status, tedious and long credit process, numerous and complicated credit transactions, and inadequate regulatory coverage. However, frequent supply chain financial events force financial institutions to improve the level of credit risk control and improve the accuracy of risk control with the help of big data evaluation, Improve the effectiveness of supply chain financial services and risk control, and ultimately enhance the stability and security of supply chain business development.According to the "2020 financial technology talent flow trend report", China's financial institutions have a strong demand for financial technology talents, and are facing a shortage of financial technology talents, especially leading experts in big data risk assessment, data mining and analysis, complex talents and innovative teams.Secondly, according to the report, as of September 2020, only 19% of the existing financial technology talents have more than 10 years of working experience, while 38% have 5-10 years of working experience. At present, financial institutions need more experienced financial technology talents.With the issuance of the financial technology development plan (2019-2021) by the central bank in 2019, financial institutions gradually use the power of science and technology to achieve their digital transformation and meet the latest regulatory requirements. At present, the most popular positions for financial technology talents are risk control evaluation and technology research and development. Therefore, the above bottlenecks further aggravate the evaluation difficulties of supply chain financial credit risk management.

2.4. The Credit Consciousness of Dishonest Subjects in the Chain is Weak, and the Credit Joint Reward and Punishment Mode is in the Exploration Period

In recent years, malicious frauds caused by the credit risk of supply chain finance have emerged frequently. In the context of asymmetric information, opportunistic behaviors such as fictitious trade background, self financing behavior and repeated false warehouse receipts have not been effectively dealt with and curbed.The reason is that the trustworthy behavior of enterprise groups in the supply chain has not been timely stimulated, and the corresponding dishonesty has not been adequately punished [10]. At the same time, the low cost of breach of contract, the huge income of breach of contract, and the weak sense of integrity of the main body and individuals in the supply chain aggravate the lack of trust between financial institutions and enterprise groups in the chain.At the level of credit main body, financial institutions and regulatory departments are not enough to punish the dishonest behavior of enterprises in the chain, and the corresponding credit joint reward and punishment mode is still in the exploration stage. At present, the credit information of enterprise groups in the supply chain is difficult to get effective collection of full coverage, and it is difficult for financial institutions to break the information island and accurately depict and prevent the overall credit risk in the chain.At the same time, because the enterprises in the supply chain do not have to pay the corresponding price for breach of contract, the dishonesty of bad enterprises and individuals is aggravated, which brings some obstacles to the supply chain credit risk management. Generally speaking, the joint reward and punishment mode of Credit Incentive and dishonesty punishment needs to be explored, and the scientific and reasonable joint reward and punishment response mode is urgently needed for the safe, efficient and reliable supply chain credit risk management.

3. Credit Risk Management of Supply Chain Finance

The theory of comprehensive risk management shows that as a long-term management mechanism throughout the whole organization, comprehensive risk management activities can orderly identify, analyze, evaluate and deal with potential risks at all levels and links through systematic management and technical means, so as to control the risks within the tolerable capacity, so as to improve the efficiency and efficiency of risk management, Finally, it helps the organization to achieve the objectives of risk management.Based on the theory of comprehensive risk management, combined with the supply chain financial credit risk transmission mechanism in practice, this paper constructs a supply chain financial credit risk transmission and management integration framework (see Figure 1). The framework reflects the strength of core enterprises, the qualification of long tail customers, the dynamic status of financing projects, and the overall situation of the supply chain. The surge and contagion of four credit risk sources may be directly transmitted to the whole supply chain, and eventually lead to the outbreak of financial credit risk in the supply chain.

Secondly, on the basis of clarifying the four risk sources, this framework combines the theory of comprehensive risk management to reveal the transmission mechanism of supply chain financial credit risk. If financial institutions can not effectively identify the source of supply chain financial risk, it will directly induce the subsequent comprehensive analysis methods to

ISSN: 2688-9323

not match, and then transmit the credit risk to the evaluation link, Finally, the proposed measures are difficult to solve the uneconomic consequences caused by the supply chain financial credit risk.Therefore, combined with the difficulties in the supply chain financial credit risk management of China's financial institutions, this paper puts forward four parallel control measures from the aspects of identification, analysis, evaluation and response, so as to avoid and weaken the step-by-step transmission of credit risk. Therefore, the research on the credit risk of supply chain finance in this paper has sufficient theoretical and practical basis.

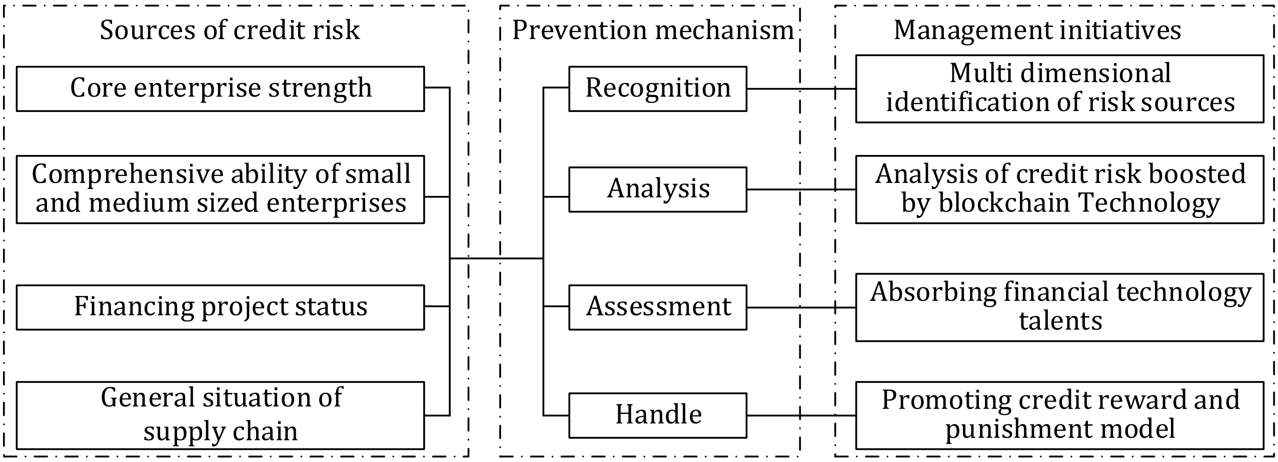

Figure 1. Credit risk transmission and management framework of supply chain finance

3.1. Multi Dimensional Identification of Risk Sources to Build a more Complete Supply Chain Financial Credit Risk Measurement and Prevention

Based on the hidden danger of credit risk transmission and diffusion and the difficulty that the whole chain credit risk is not covered by the system, financial institutions can take the following measures. First, establish the supply chain finance white list.Strictly control the admittance qualification of core enterprises and small, medium and micro enterprises in the chain, regularly screen high-quality supply chain cooperation alliances and establish a white list, comprehensively investigate and objectively evaluate the historical credit quality, business transaction status, upstream and downstream cooperation relationship, solvency and other factors of participants in the chain, so as to achieve accurate drip irrigation from the root, Identify the supply chain credit default risk caused by access qualification.Secondly, expand the sample size of the research object. On the basis of quantitative measurement, focus on non-financial qualitative indicators, comprehensively screen the strength of core enterprises in the chain, the qualification of small and medium-sized enterprises, the dynamic status of financing projects, and the overall operation of the supply chain. At the level of core enterprise strength, it should cover its own enterprise quality, credit rating, industry status, operation ability, profitability and solvency;The qualification level of small and medium-sized enterprises should include their credit rating, profitability, solvency and growth ability; The dynamic status of financing projects should include information management ability, value fluctuation and liquidity of pledge, accounting period and bad debt loss of accounts receivable, stability of business cooperation, etc.

3.2. The Long Tail Customer Group Strengthens Credit Enhancement, with the Help of Blockchain Technology to Promote more Accurate Analysis of the Whole Chain Credit Risk

In order to effectively deal with the lack of credit transmission strength of backbone enterprises and the bottleneck of information asymmetry barriers between banks and enterprises, we can improve it from the following aspects. First, we should actively promote the interactive direct

ISSN: 2688-9323

connection between banks and insurance companies. Financial institutions can strengthen cooperation with insurance institutions in the aspects of information sharing, debt recovery and compensation. At the same time, insurance institutions can provide credit guarantee insurance to support small, medium and micro enterprises, further strengthen the credit increase of long tail customers, and slow down the supply chain financial credit risk caused by information asymmetry.Second, strictly control the quality of information on the chain. It comprehensively uses big data, artificial intelligence, mobile Internet, cloud computing, Internet of things and other information technologies to analyze and mine massive data footprints, so as to ensure the application of the above blockchain at the level of information analysis, screening and cross verification.Third, encourage more participants to join the chain. Under the premise of strengthening privacy protection and security sharing, more supply chain participants are encouraged to connect their business systems to the blockchain platform and complete the registration and storage of information. With the help of the consensus mechanism of high transparency, traceability and tampering resistance of blockchain, financial institutions use different algorithms to complete the full cross analysis and verification of information, breaking the information island of the main body in the chain, Finally, the multi-level lossless transmission of credit is realized.

3.3. Absorb Financial Technology Talents, Big Data Intelligent Technology to Promote Supply Chain Financial Credit Risk Management

In the new round of credit risk management of supply chain finance, in addition to building a more reasonable credit evaluation model of supply chain finance, we should also broaden the talent absorption channels to strengthen the credit risk evaluation ability of supply chain finance. We should recruit and reserve big data risk evaluation talents through campus, and use social recruitment, headhunting, special appointment and other ways to attract sophisticated big data risk evaluation talents.First, we should cultivate talents of financial science and technology. Financial institutions should take the initiative to build a talent training plan for big data risk control, promote in-depth cooperation between schools and enterprises, cultivate more compound talents who are good at big data intelligent evaluation, cloud computing, financial AI, blockchain and other cutting-edge technologies, and finally improve the talent pool of supply chain financial credit management.Second, improve the differential pay incentive measures. Financial institutions should continue to expand the team of financial technology talents, establish and improve differentiated salary incentive scheme and assessment system suitable for the financial market, so as to attract, motivate and develop a large number of mature financial technology talents for big data risk control, and break through the bottleneck of shortage of financial technology talents for big data risk control.Third, speed up the construction process of emerging disciplines. At present, there are only more than 20 colleges and universities in China offering financial technology or artificial intelligence and other related colleges or majors, so the professional training and talent transportation are difficult to meet the market demand. Therefore, colleges and universities should also speed up the planning process and professional construction of financial technology talents for big data intelligent evaluation and risk control, and actively set up financial technology related majors for big data intelligent evaluation and big data risk control.

3.4. Promote the Credit Reward and Punishment Mode, and Increase the Punishment of Enterprises and Individuals who Breach the Credit of Supply Chain Finance

Financial institutions can deal with the difficulties of low default cost, high default income and lack of credit breaking punishment measures from the following dimensions. First, accelerate the implementation of joint credit punishment. Financial institutions and regulatory authorities should speed up the construction of joint credit punishment mode, appropriately open, share and collect government and market credit data, and build the database of dishonest enterprises and individuals in the supply chain.The honest enterprises in the supply chain should be given multiple incentives, and the dishonest enterprises and individuals in the supply chain should be jointly punished across regions and departments. For example, their dishonesty should be included in the joint credit punishment list, bear the legal consequences or economic costs, and publish their malicious dishonesty records to other subjects in a legal way. Secondly, the financial institutions should formulate a detailed scheme for the classification of dishonesty.It is necessary to formulate a detailed scheme for grading the supply chain financial dishonesty, and take corresponding punishment and restriction policies according to the different degrees of default and violation behaviors of the credit subject in the supply chain. The serious malicious dishonesty subject can be removed from the credit white list. With the help of credit incentives and economic constraints, we should strengthen the role of credit supervision and warning.Finally, clearly define the responsibility of joint rewards and punishments. We should define the responsibility of joint rewards and punishments of supply chain credit to individual, and form "trustworthy income" in daily business such as credit approval; The reward and punishment policy of "limited breach of trust".

4. Conclusion

This paper is from the perspective of financial institutions dominated by commercial banks. Taking the credit risk of supply chain finance as the research object, this paper analyzes the difficulties existing in the credit risk management of supply chain finance in the new era, and tries to build an integrated framework of credit transmission and risk management of supply chain finance by referring to the classical theory of comprehensive risk management and integrating the transmission mechanism of credit risk of supply chain finance in practice. After research, the following conclusions are formed.

First of all, through the analysis and carding of supply chain financial credit risk, it is found that the proliferation, outbreak and infection of four credit risk sources, namely core enterprise strength, long tail customer group qualification, financing project dynamic status and overall supply chain operation overview, may be directly transmitted to the whole supply chain and eventually induce supply chain financial credit risk.

Secondly, through the analysis of the current situation of supply chain financial credit risk management, it is found that the hidden trouble of credit risk transmission is identified, and the whole chain credit risk is not covered by risk control; The credit risk analysis of the whole chain system is limited, and the barriers of information asymmetry between banks and enterprises need to be broken; The reserve of intelligent evaluation financial talents is insufficient, and the human investment in big data risk control is still weak; The credit consciousness of dishonest subjects in the chain is weak, and the credit joint reward and punishment mode is in the exploration period.

Finally, based on the comprehensive risk management theory, combined with the supply chain financial credit risk transmission mechanism in practice, this paper constructs an integrated framework of supply chain financial credit transmission and risk management, and finally proposes multi-dimensional selection of risk sources to build a more complete supply chain financial credit risk measurement and prevention; The long tail customer group strengthens credit enhancement, and the blockchain empowerment helps to enhance the whole chain credit penetration ability among alliances; We should promote the credit reward and punishment mode, and increase the punishment of enterprises and individuals who breach the credit contract in supply chain finance; Attracting financial technology talents and big data intelligent risk control are the four major measures of supply chain financial credit risk management.

Acknowledgments

Chongqing Social Science Fund Project: "Research on the influence mechanism and effect of venture capital institutions on the internationalization of enterprises in different life cycles in Chongqing" (No:2019YBGL072).

References

[1] N.B. Allen, E. Hofmann: Supply chain finance: some conceptual insight, Journal of Logistic Management, Vol. 32 (1968) No.02, p.76-80.

[2] M. Hamadi, K. Abdelmoula: Credit-risk evaluation of a Tunisian commercial bank: logistic regression vs neural network modeling, Journal of Accounting & Management Information Systems, Vol. 09 (2010) No.01, p.92-119.

[3] H. Song, X. Yang: Sources of supply chain financial risk and systematic management: an integrated framework, Journal of Renmin University of China, Vol. 32 (2018) No.04, p.119-128. (In Chinese).

[4] l.M. Xia, H.H. Zong and L. Meng: The construction of credit risk evaluation index system of small and medium-sized enterprises -- Based on the perspective of supply chain finance, Journal of Financial forum, Vol. 16 (2011) No.10, p.73-79. (In Chinese).

[5] J. Li, J.L. Zhang: Credit risk identification and early warning model of supply chain finance, Journal of Economic management, Vol. 41 (2019) No.08, p.178-196. (In Chinese).

[6] H.Q. Hu, L. Zhang and D.H. Zhang: Credit risk assessment of SMEs from the perspective of Supply Chain Finance: a comparative study based on SVM and BP neural network, Journal of Management review, Vol. 24 (2012) No.11, p.70-80. (In Chinese).

[7] G.R. Li, S.X. Zhao: Research on evolution mechanism and management of supply chain financial credit risk under the background of resumption of work and production -- Based on sem-sd model, Journal of Business research, Vol. 63 (2020) No.05, p.112-122. (In Chinese).

[8] F.Z. Fan, GQ. Su and X.Y. Wang: Research on credit risk evaluation and risk management of small and medium-sized enterprises under the mode of supply chain finance, Journal of Central University of Finance and economics, Vol. 37 (2017) No.12, p.34-43. (In Chinese).

[9] Y. Zheng, K.X. Zhang: Research on risk management of supply chain finance -- from the perspective of SME financing, Journal of Financial development research, Vol. 39 (2020) No.10, p.45-51. (In Chinese).

[10] J.H. Yi, F. Guo: Selection and application of enterprise credit risk evaluation index system from the perspective of supply chain finance, Journal of Jinan University (SOCIAL SCIENCE EDITION), Vol. 31 (2021) No.2, p.103-112. (In Chinese).