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Research Review of the Development of Supply Chain Finance

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ABSTRACT

As a new financing mode, supply chain finance has been highly concerned by the public in recent years. This paper systematically combs the relevant literature on supply chain finance, reviews the relevant research in the field of supply chain finance from the five perspectives of the concept definition, development stage, financing mode, economic consequences and risk management of supply chain finance, and discusses the deficiencies in the current research and possible research directions in the future. This paper can help scholars grasp the characteristics, development context and research status of supply chain finance, better understand the application scenario and role of supply chain finance, and find future research opportunities.

KEYWORDS: *supply chain finance; development stage; financing mode; risk management*

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I. INTRODUCTION

Supply chain finance starts from the supply chain as a whole, integrates logistics, capital flow, information flow and other information according to the scenario of supply chain management, and builds a financial supply system and risk assessment system that integrates core enterprises and upstream and downstream enterprises in the supply chain based on real transactions (Li H, et al., 2019) ,which can quickly respond to the comprehensive needs of enterprises in the supply chain such as settlement, financing, financial management, etc., and focuses on solving the financing difficulties of small and medium-sized enterprises. Therefore, it was widely recognized and actively promoted by financial institutions at the beginning of its launch.

With the development and continuous improvement of supply chain finance, scholars' research in this field is also expanding and deepening. At an important juncture in the development of supply chain finance, this paper analyzes the development context and logic of the existing literature by searching the relevant literature on supply chain finance, and summarizes the relevant research results from the five perspectives of supply chain finance: definition of concept, development stage, financing mode, economic consequences, and risk management, with a view to exploring the direction of further research in the future. The research in this paper can provide valuable reference for the theoretical and practical development of supply chain finance related fields, and help scholars grasp future research opportunities.

II. Definition of supply chain finance

In 1998, Hartley proposed the design of accounts payable model and supply chain financing system. In 2000, Timme first proposed the concept of supply chain finance. Later, Hofinann raised the connotation of supply chain finance to a theoretical level. He believed that supply chain finance is a process in which multiple participants coordinate and cooperate with each other to promote the flow of funds in the supply chain and create common value (Hofmann E, 2005). Michael believes that core enterprises are at the core of the supply chain. All enterprises in the supply chain can exchange and trade with the core enterprises as the medium, avoiding many complex links and reducing the trade costs between enterprises (Michael L, 2007). Chen and Hu believe that supply chain finance is a bridge linking small and medium-sized enterprises and banks, and can increase the value of enterprises in the supply chain by reducing the risk of supply and demand mismatch in the financing process(Chen and Hu,2011).From the perspective of financial services, supply chain finance is generally regarded as short-term financing of enterprises (Gomm, 2010; Hu Yuefei, 2007), a financing solution based on supply chain transactions to solve the financing difficulties of small and medium-sized enterprises (Xia Taifeng, 2011).

In general, the research on supply chain finance is mainly divided into two categories, namely "financial view" from the perspective of finance and "supply chain view" from the perspective of supply chain. Scholars' research on supply chain finance starts from supply chain financing, which is the initial combination of supply chain and finance, and also the basic function of supply chain finance.

III. Development stage of supply chain finance

Since the 1970s, the division of production has shifted from within enterprises to between enterprises. Under this change, a core enterprise is required to coordinate with different enterprises in the whole production process, and the supply chain emerges as the times require. At first, supply chain management focused on logistics and information flow, while ignoring capital flow (Hofmann E, 2005).At the end of the 20th century, entrepreneurs and scholars discovered the overall financing cost of the supply chain caused by global outsourcing activities. Core enterprises and financial institutions began to pay attention to the financial management process of the entire supply chain. Supply chain finance, an innovative financial model, emerged at the historic moment.

The practical development of supply chain finance can be divided into four stages. The first stage is the traditional supply chain finance led by financial institutions, the second stage is the online supply chain finance led by industrial enterprises and coordinated by financial institutions, the third stage is the platform supply chain finance of multi-agent professional cooperation, and the fourth stage is the supply chain finance enabled by financial technology (Li Jian et al., 2020).

With the emergence of new technologies such as big data, the Internet of Things and cloud computing, more and more researchers begin to focus on the application of new technologies in the supply chain finance field. The progress of science and technology will provide strong technical support for the development of supply chain finance. Blockchain technology helps to solve the problems of information asymmetry and credit crisis in financial transactions and improve the supply chain financial ecological environment (Chu Xuejian and Gao Bo, 2018).The enabling effect of modern information technology on supply chain finance is mainly reflected in the fact that the transaction activities at the asset end of the supply chain can be truly and transparently reflected, the value demands of multiple customer entities in multiple scenarios can be identified in a timely manner and effectively resolved, and the debt-creditor relationship at the capital end is more clear (Song Hua and Yang Yudong, 2019).

"Blockchain+supply chain" finance is still at the initial stage of implementation. In the future, with the popularization of blockchain technology in the supply chain and the improvement of the level of enterprise digitalization, digital supply chain finance based on blockchain technology will become a more efficient and inclusive financial support means (Gong Qiang et al., 2021).

IV. Financing mode of supply chain finance

With the increasingly diversified and refined supply chain finance development model and service types, there will be more integrated supply chain finance service models in the future. At present, there are three common supply chain financing modes: accounts receivable financing, inventory pledge financing and prepayment financing. Accounts receivable financing means that enterprises use the accounts receivable in the signed sales contract as the repayment source to obtain funds (Lu Qihui et al., 2012), which has become a powerful magic weapon to alleviate the financing difficulties and expensive problems of small and medium-sized enterprises (Xu Yuanyuan and Li Changqing, 2022);Inventory pledge financing refers to that an enterprise uses its own inventory as collateral, transfers it to a third-party logistics company for management, and then loans to financial institutions (Li Yixue et al., 2007). Recently, a new application model of inventory pledge under the blockchain framework was proposed according to the underlying basic framework of the blockchain (Li Bingkun, 2022);Prepayment financing refers to the fact that suppliers and purchasers cannot provide full payment to suppliers due to the lack of working capital of purchasers in the process of purchasing goods, and financial institutions participate in the procurement process to make the procurement process smooth (Xiao Di et al., 2014), mainly to solve the problem of capital shortage faced by small and medium-sized enterprises providing services to large enterprises when conducting stable and long-term trade with large enterprises.

V. Economic consequences of supply chain finance

Supply chain finance has improved the efficiency of the use of supply chain information resources by building a long-term partnership network and forming an open information resource sharing model (David and Wuttke, 2013).Supply chain finance extends the credit evaluation and risk bearing of a single entity from a single node to the whole chain of the supply chain, which effectively balances the financial availability between upstream and downstream enterprises and core enterprises, thus solving the inefficient resource allocation dilemma of traditional finance (Haitao, 2019).

The research on the economic consequences of supply chain finance mainly focuses on easing the financing constraints of small and medium-sized enterprises. The credit creation mechanism of supply chain finance has become an effective means to solve the credit shortage of small and medium-sized enterprises and reduce the financing costs (Zhang Lu, 2019), providing a new way to solve the financing difficulties of small and medium-sized enterprises. Compared with traditional bank lending, supply chain finance can effectively reduce the information asymmetry before and after the loan by obtaining transaction information and transaction credit, using relationship embedding and business closure, and adopting the combination of post-loan result control and process control, so as to improve the financing availability of small and medium-sized enterprises, reduce financing costs, and ultimately improve their financing performance (Song Hua et al., 2017). At the same time, supply chain finance can promote the digital transformation of enterprises by reducing information asymmetry and transmitting good market signals, mitigating financial constraints and strengthening financial stability, improving total factor productivity and increasing innovation output (Zhang Lina et al., 2021).

Although existing studies have focused on small and medium-sized enterprises, the important role of core enterprises in supply chain finance cannot be ignored. Supply chain finance can significantly improve the technological innovation level of core enterprises (Ling Runze et al., 2021), improve the operational efficiency and financial performance of core enterprises (Song Hua et al., 2021), and accelerate the speed of enterprise capital structure adjustment (Pan Ailing et al., 2021).

VI. Risk management of supply chain finance

Compared with ordinary commercial loans and commercial credit, supply chain finance has higher risks because of its particularity. The key to the success of supply chain finance is to effectively control risks.

The initial research on supply chain risk (Christopher M and Mena C, 2011) mostly ignored the risk control of supply chain capital flow. Subsequently, scholars began to realize the risk of capital cut-off in the supply chain. Rafael and Javier designed some business operation specifications and risk management measures by studying the business process of supply chain financing to try to avoid market risk and moral hazard in supply chain financing. Barsky and Catanach have conducted a multi-angle study on the risk of supply chain financing, and believe that the commercial financing closely related to logistics finance is different from the traditional credit loan. When conducting risk control on this business, the risk control concept based on subject access is changed to the risk management concept based on process control (Barsky and Catanach, 2005).

Supply chain financial risk can be divided into overall supply chain financial risk and supply chain financial specific risk. Among them, the overall supply chain financial risk is divided based on the risk sources of supply chain finance (Li Yixue, 2011), and the online supply chain financial risk assessment based on the third-party B2B platform (He Shengxuan and Shen Songdong, 2016).Specific risks of supply chain finance include credit risk (Fan Fangzhi et al., 2017) and collateral price risk (Wang Jianhe Juan, 2016). Chen Baofeng et al. proposed a model to measure value risk and studied the value risk measurement of inventory pledge financing business (Chen Baofeng et al., 2007).Niu Xiaojian, Guo Dongbo and others proposed the supply chain financing risk management system and risk measurement model for bank credit extension by using the Credit Metrics model, revealing the risk degree of supply chain financing (Niu Xiaojian and others, 2012).In order to reduce the shortage that most of the current supply chain financial businesses rely on expert evaluation, some scholars put forward a credit risk evaluation system considering the subject rating and debt rating from the perspective of commercial banks, and established a credit risk evaluation model using the principal component analysis method and Logistic regression model (Xiong Xiong et al., 2009);Some scholars have also established a model to evaluate the risk of accounts receivable under the supply chain financial model by comprehensively using expert judgment, credit scoring and Bayesian network methods (Xiao Kuixi et al., 2011).

By reviewing the research on supply chain financial risk management, we can find that the research on supply chain financial risk management is changing from qualitative discussion to quantitative measurement. However, the current quantitative research usually starts with the specific factors of supply chain finance and analyzes the impact of these factors on the risk of the entire financing business. However, there are few studies that use the mature and structured risk measurement model to comprehensively quantify the overall risk of supply chain finance.

VII. Summary and prospect

With the continuous development of supply chain finance, the research related to supply chain finance is also expanding and deepening. This paper combs the relevant research from the five perspectives of supply chain finance, including its concept definition, development stage, financing mode, economic consequences and risk management, and finds that there is still room for further expansion and improvement in this field.

At present, some literatures have studied the economic consequences of supply chain finance, but the research perspective and scope need to be expanded. Supply chain finance is an important part of corporate financial decision-making. At present, the literature on the impact of supply chain finance on corporate financial behavior is relatively small, especially the empirical research literature is relatively small. Therefore, the impact of supply chain finance on corporate financial behavior needs to be further studied in the future.

Compared with the research on the economic consequences of supply chain finance, there are fewer literatures on the influencing factors of supply chain finance adoption. Some scholars have studied the impact of the level of inter-enterprise and intra-enterprise cooperation, the level of digitalization of trade processes, and the bargaining power and financial strength of leading enterprises on the adoption of supply chain finance (Caniato et al., 2016), but in general, there are few literature achievements. Supply chain finance is an effective means to solve the financing problems of enterprises. As the future development trend, it is also important to study the influencing factors of supply chain finance adoption.

With regard to supply chain financial risk management, the existing research mainly focuses on evaluating the credit risk of financing enterprises from the perspective of banks and using different risk assessment models. However, under the supply chain finance model, core enterprises play a counter-guarantee role, so it is also necessary to identify and evaluate the types of risks faced by core enterprises, while the existing research has ignored the research on the risks faced by core enterprises. Further, since supply chain finance often relies on the network structure of supply chain to form an ecosystem, future research needs to pay more attention to risk control of the entire supply chain financial ecosystem.

There is still a lot of research space and opportunities in the research of supply chain finance. With the emergence of new technologies such as big data, Internet of Things and cloud computing, more attention should be paid to the research direction of "Internet plus+supply chain finance" in the future. In addition, the concept of protecting the earth's environment and building a green ecosystem is becoming more and more clear in the world. Green supply chain finance will be a development direction in the future, and the existing supply chain finance will also gradually shift towards the direction of green sustainability. Green supply chain finance is to integrate the concept of green finance into the supply chain in order to achieve environment-friendly in the whole supply chain process.

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