

# Review and Development Analysis of Agricultural Product Supply Chain Finance

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## ABSTRACT

Agricultural product supply chain finance is a new development model that has emerged in recent years. It solves the problems of financing difficulty and high cost of some agricultural product enterprises, and finds a way to realize the rapid development of local agricultural products. The development of China's agricultural product supply chain finance is relatively late, both in application practice and theoretical research are still relatively backward. This article will summarize the current domestic and foreignrelated research results from three aspects of agricultural product supply chain financial model design, risk prevention and control and innovation path, and analyze its development trend and put forward development suggestions, so as to study and think about similar issues, and hope to promote the practice of agricultural product supply chain finance and the development of agricultural industrialization in China.

**Keywords:** agricultural product supply chain finance; model research; risk prevention and control; innovation path; development analysis

## 1. INTRODUCTION

In recent years, many commercial banks are actively carrying out the mode of supply chain finance, especially since the 12th Five Year Plan, the State advocates to solve the problems of "agriculture, rural areas and farmers" and overcome the key task of building a moderately prosperous society in an all-round way. Therefore, agricultural supply chain finance has been widely developed in many areas. At present, there is no unified definition of agricultural product supply chain. Based on the viewpoint of Xu Xincheng[1], this paper believes that the agricultural product supply chain is the whole chain, with agricultural product enterprises as the core, and through the control of information flow, logistics and capital chain, the process from the exploitation of agricultural products to the consumption of products is completed, and the cooperation among multiple nodes in the chain is completed. At the same time, different from the traditional supply chain, the regional, seasonal and decentralized characteristics of agricultural production are very prominent.

In the process of China's agricultural organization sector transformation, in order to enhance the competitiveness of agricultural supply chain, we need to improve the conditions of agricultural development from all aspects, among which the support of financial system is crucial. At present, the implementation of supply chain finance in China's commercial banks is still in its infancy. However, because of the weak nature of agricultural industry,

agricultural institutions have quite distinct production characteristics. In view of the characteristics of high cost, high risk and low rate of return of agricultural product finance, the current research on agricultural product supply chain financial system is not comprehensive enough, and the research on its service is very few. In recent years, based on the previous research and practice at home and abroad, domestic scholars began to study the theory and practice of agricultural supply chain finance, and achieved some results. However, the research in this field in China lags behind that of foreign countries, and the understanding of some problems is not very deep.

This article will sort out and summarize the research results of agricultural product supply chain finance at home and abroad, analyze the mode research, risk prevention and control and its innovation path, summarize the development trend of agricultural product supply chain finance and put forward practical suggestions, and finally summarize the research content, hoping to provide reference for the development of agricultural modernization in China.

## 2. RESEARCH ON THE FINANCIAL MODEL OF AGRICULTURAL PRODUCT SUPPLY CHAIN

There are many achievements in foreign research on supply chain finance, but the literature on agriculture is still relatively small, and now it is gradually paying

attention to this research. In the aspect of agricultural finance research, Buchenau J [2] summarized the government-civilian cooperation, hierarchical and coordinated development of agricultural finance support models, and discussed the characteristic design of models in different countries. Swamy and Dharani [3] conducted research on the financing model of Indian agricultural value chain, analyzed its shortcomings and put forward relevant recommendations from the aspect of national policy. With the implementation of supply chain finance, the research on agricultural product financing in China started, which provides ideas for the development of agricultural industrialization. Duan Weichang and Hu Ting [4] analyzed the current situation and existing problems of China's agricultural financing, proposed three financing models, and demonstrated through empirical analysis that agricultural supply chain finance takes leading enterprises as the core, and banks evaluate financing from the overall operation of the supply chain risk. Zou Wuping [5] designed a related supply chain financial financing model by studying the development of Guangxi's sugar industry. Quan Xiyu [6] summarized the specific operation mode of current agricultural supply chain finance, and used the Shapley value model to compare and analyze the benefits of the supply chain under different cooperation methods, proving that agricultural supply chain finance can realize the balance and maximization of the overall benefits of the supply chain.

For the financing mode of supply chain finance, according to the different leading institutions, Xu Hongzhi [7] discussed three typical international supply chain financial models-logistics enterprise dominance, enterprise group cooperation and commercial bank service mode, and compared the financing dominance, operational advantages and information control of the three modes. Yu Jiachao [8] analyzed three agricultural product supply chain financial models commonly used in the current supply chain finance field — accounts receivable, inventory, and prepaid accounts. According to the actual loan cases in the credit work, the basic process, the characteristics and case application are explained in detail. He Jing [9] selected bank A's supply chain finance prepaid account financing model as the research object, and introduced the various processes that it provides prepaid account financing. Zhu Yong and Jiang Taotao [10] analyzed the advantages and disadvantages of various financing warehouse operation modes under traditional and supply chain conditions, as well as the advantages and risks and disadvantages of existing operation modes. On this basis, they proposed a new alliance model based on the fourth party logistics in the supply chain environment. Li Qian [11] securitized accounts receivable in supply chain finance, introduced its related concepts and operating procedures, and analyzed the applicability of the model. Fellenz et al. [12] studied the financial dynamic model of the global supply chain network and believed that a universal, transparent, and collaborative sharing system should be established to integrate the physical supply chain and supply chain finance. Chen Y et al. [13] proposed an online supply

chain financing model based on commodity mortgages, which used transaction records to evaluate dynamic credit lines and provide timely financing services for the entire supply chain. Zeng Lingling et al. [14] built an optimized model of "rural bank + e-commerce platform" for agricultural supply chain finance. Zhao Jinxing and Zhen Ye [15] based on the development status and financing needs of the characteristic agricultural products industry in Shanxi Province, proposed a supply chain internal, external and internal and external mixed financing model based on "Internet + pre-sale/big data/moveable property pledge".

### **3. RESEARCH ON FINANCIAL RISK OF AGRICULTURAL PRODUCT SUPPLY CHAIN**

Scholars at home and abroad have identified and measured the financial risks of agricultural product supply chain from three aspects: risk identification, risk measurement and risk control, and proposed corresponding methods to reduce the financial risks of agricultural product supply chain. In terms of risk identification, Chris Lonsdale [16] started with the analysis of supply and demand in the agricultural product supply chain, identified the risks involved in the process, and also proposed risk management measures and explained the main control points. Baosen Wang [17] uses risk management theory, selects risk identification and risk measurement methods, and conducts in-depth analysis of financial operational risks in the Internet supply chain. D Sugiarto [18] cipanang primary rice market (CPRM) identified the source of risk in the DKI-Jakarta rice supply chain. Using Pareto chart and time series analysis method to collect and analyze secondary data from multiple sources. Cui Houqing [19] identified the risk factors that affect the operation of the agricultural product supply chain through the SCOR method and reference related literature, and established a relatively reasonable risk evaluation index system for the agricultural product supply chain through the identified risk factors. Cheng Zitao [20] summarized relevant documents at home and abroad, identified the risk factors of the agricultural product supply chain, and summarized 7 major types of risks including environment, politics, cooperation, logistics, and demand from the environment in which the risks occurred.

In terms of risk measurement, Brueckner [21] introduced moral hazard and information asymmetry in his analysis, and constructed pledge contracts to analyze supply chain financial risks; Yan Bo [22] assessed the risk of agricultural product supply chain under the Internet of Things environment, used OWA operator to quantitatively evaluate and rank risk factors, and used the supply chain risk diffusion and convergence model to find quantitative indicators to measure supply chain risk fluctuations; Zeng Nini et al. [23] built an indicator system for evaluating financial risks in the agricultural product supply chain from four aspects, and used the Uncertain Hierarchy

Analysis Method (U-TAHP) and Fuzzy Pattern Recognition (FPR) to establish the agricultural product supply chain Financial risk evaluation system. In addition, Xu Peng [24] explored business risk elements in detail, and used structural equation theory to evaluate financial risks in the online agricultural product supply chain.

In terms of risk control, AanMarimin [25] pointed out the necessity of financial risk management in the research, and cited the intelligent decision support system to build a risk control model for agricultural products; Yan Bo [26] established a risk assessment method of agricultural product supply chain based on conditional value at risk (CVaR), analyzed and evaluated the risk in agricultural product supply chain, and determined the optimal combination of risk control. Jing Huang [27] considered the risks of financing participants and established a supply chain financing framework based on general supply chain contracts, proving that reasonable wholesale prices can eliminate SCF risks and guide retailers' ordering and bank interest rate decisions. Chen Xiaolin and Feng Junwen [28] combined the characteristics and current situation of agricultural product supply chain, used index method and reliability evaluation matrix method to evaluate and evaluate agricultural product supply chain risk, and clarified the control of agricultural product supply chain financial risk; Kang Biao [29] made an overall analysis of the agricultural product supply chain on the basis of the "agricultural supermarket docking" agricultural product supply chain, studied its elements and modes, identified risks by combining qualitative and quantitative methods, established a risk evaluation model with fuzzy theory and mathematical methods, and studied risk control.

#### 4. FINANCIAL INNOVATION PATH OF AGRICULTURAL PRODUCT SUPPLY CHAIN

The core of financial innovation in the agricultural supply chain is to reduce the overall cost and improve the level of risk control. Judging the effectiveness of the innovation mechanism is also based on this consideration. Agricultural product supply chain finance is closely related to agricultural supply chain finance, and the two can be analyzed in combination. In terms of product innovation, Chang Yudong [30] proposed that according to the characteristics of agricultural supply chain finance, combined with the use of new Internet technologies, innovative credit product design, so that products and industrial development cycle matching degree higher. Jin Ming [31] proposed that agricultural product processing enterprises have relatively long capital turnover time and storage cycle, and financial institutions can provide them with flexible and diverse loan services based on this feature; in terms of insurance mechanisms, Jin Ming [31] proposed adopting policy-based Plant insurance species and use it as a supplementary measure for the risk control of the "commercial bank + farmer circulation loan" project, so that the project can better resist risks while ensuring the

credit of the participants. In terms of risk prevention and control, Chang Yudong [30] believes that modern information technology should be used to improve the overall risk control capability of agricultural supply chain finance. Jin Ming [31] proposed that financial supervision and management departments should strictly review the qualifications of financial institutions, based on the price discovery function of the futures market, and design agricultural insurance products that guarantee income levels based on the prices formed in the futures market. In addition, Jiang Lijun [32] proposed that under the trend of "new retail", the agricultural product supply chain will open the C2B and F2B new retail social e-commerce model, transforming from decentralized independent competition to a coordinated mechanism format. Ye Hualiang [33] proposed that financial institutions can rely on advanced technologies such as big data and cloud computing to develop a management information system suitable for the characteristics of agricultural supply chain financial services, so as to realize logistics, capital flow links and real-time information sharing between banks and enterprises, improve the financial information support system of the agricultural supply chain. In the end, Chang Yudong [30] proposed to design service mechanisms to allow farmers to better participate in the development of the industry. At the same time, the service mechanism should coordinate the overall situation, with the overall optimization of the agricultural industry chain as the core, and transform to a data-driven supply chain financial model.

### 5. ANALYSIS AND PROSPECT OF AGRICULTURAL PRODUCT SUPPLY CHAIN FINANCE DEVELOPMENT

#### 5.1. *Development trend of agricultural product supply chain finance*

In view of the difference between the current situation of agricultural development and foreign countries, the next development of China's agricultural supply chain finance will be based on the most fundamental and core issues, with the following trends: the establishment of rural credit information system, integration of platform and industrialization, integration with internet plus, integration of online and offline, risk prevention and closed-loop management. Now based on the prosperity of e-commerce platform, agricultural product supply chain financing has a new path. The design of online financing mode and the application of modern information technology in financial risk control of agricultural product e-commerce platform will become an important research trend. The operation of supply chain finance increasingly emphasizes the profound grasp of industrial supply chain scenarios and comprehensive risk management and control capabilities. For agricultural product supply chain finance, creating an agricultural product supply chain model centered on

"consumers" and improving consumer experience is an important part of future development. Scene experiential marketing will penetrate the agricultural product supply chain.

At the same time, with the in-depth development of blockchain technology in China, it is possible to trace the supply chain of agricultural products, including quality, timeliness, and logistics processes, making the entire link transparent and increasing the confidence of consumers, financial institutions, companies and other participating entities. In addition, agricultural industrialization is advancing simultaneously with the development of agricultural product supply chain finance. In this context, the specific development direction of agricultural product supply chain finance, national policy protection, the improvement of laws and regulations, and how to use existing technologies to avoid and minimize risks are all issues. It needs scholars to study in combination with the actual situation.

### ***5.2. Suggestions on the development of agricultural product supply chain finance***

In terms of suggestions for the development of agricultural supply chain finance, we mainly start with different entities. First, from the government level, improve the construction of relevant laws and regulations to provide legal support for all participating entities in agricultural supply chain finance, so that there are laws to follow; introduce relevant preferential policies and guide them to favor financial institutions to encourage them to actively develop agricultural product supply chain financial services; guide all parties involved in the supply chain to cooperate in various forms; establish and maintain a solid alliance of interests, and at the same time catalyze the creation of a special agricultural product industrial chain, as a model to promote; attach importance to the cultivation of financial talents in the agricultural supply chain. From the level of financial institutions, integrate high-quality resources and broaden funding channels; enrich information acquisition and improve the credit system; attach importance to financial technology to prevent and control financial risks.

For supply chain finance, the most important thing is the core enterprises. It is recommended to improve their own strength; improve the current supply chain management capabilities; core enterprises and leading agricultural enterprises take on the social responsibility of helping the development of small and medium-sized enterprises; establish a solid alliance of interests among the participants in the supply chain; attach importance to the talent pool in supply chain finance. For small and medium-sized enterprises, it is recommended to pay attention to relevant national preferential policies; maintain a good reputation; take the initiative to establish a solid alliance with core enterprises; maintain communication with financial institutions, enrich network resources, and create a good financing atmosphere.

## **6. CONCLUSION**

By summarizing and sorting out existing academic achievements at home and abroad, we know that due to the particularity of agricultural products and the actual application of supply chain finance in agriculture, domestic and foreign research on agricultural product supply chain finance appears to be a little weak. At the same time, it is also understood that the existing research on it in China is affected by the industrial supply chain and is not integrated into the actual development of China's agriculture; and on this basis, the design of the financial risk identification and control of the agricultural product supply chain is aimed at the natural risks of agricultural products, Research on storage and transportation is relatively lacking. In addition, the development of agricultural product e-commerce is fast. Research on the financial model of agricultural product supply chain based on e-commerce platform is stagnant in practice, and cannot meet the financial needs of online agricultural products. At the same time, there is insufficient research on Internet information technology in financial risk management and control. These problems are all Will become a very important research trend.

In view of the shortcomings in the theoretical and practical research of agricultural product supply chain finance, we need to in-depth research on its current development reality and existing problems on the basis of existing research. We must combine the actual situation of China's agricultural development to innovate the agricultural product supply chain financial model; design risk prevention and control measures with the help of modern information technology. At the same time, different participants in the entire chain work together to innovate and improve the financial development environment of agricultural supply chain, provide better services and financial support. Finally conform to the development of agricultural supply chain finance trend, combined with technological progress, to achieve the healthy development of online agricultural product supply chain finance, and ultimately promote the development of agricultural industrialization.

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