

Association for Information Systems

AIS Electronic Library (AISeL)

ICEB 2020 Proceedings

International Conference on Electronic Business
(ICEB)

Winter 12-5-2020

Research on Mode and Risk Prevention of Agricultural Supply Chain Finance based on E-commerce

Qiming Zheng

Nanjing Polytechnic Institute, Nanjing, China, 13813038069@163.com

Mingxuan Zheng

Northeast Forestry University, Harbin, China, ZhengMX1999@126.com

Yaqin Dou

Nanjing Institute of Technology, Nanjing, China, douyq@njit.edu.cn

Follow this and additional works at: <https://aisel.aisnet.org/iceb2020>

Recommended Citation

Zheng, Qiming; Zheng, Mingxuan; and Dou, Yaqin, "Research on Mode and Risk Prevention of Agricultural Supply Chain Finance based on E-commerce" (2020). *ICEB 2020 Proceedings*. 21.

<https://aisel.aisnet.org/iceb2020/21>

This material is brought to you by the International Conference on Electronic Business (ICEB) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICEB 2020 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Research on Mode and Risk Prevention of Agricultural Supply Chain Finance based on E-commerce

(Full Paper)

Qiming Zheng, Nanjing Polytechnic Institute, Nanjing, China, 13813038069@163.com
Mingxuan Zheng, Northeast Forestry University, Harbin, China, ZhengMX1999@126.com
Yaqin Dou*, Nanjing Institute of Technology, Nanjing, China, douyq@njit.edu.cn

ABSTRACT

The rapid development of e-commerce has a profound impact on agricultural supply chain finance (ASCF), which is of great significance to enhance the resilience of agricultural economic development, realize the poverty alleviation effect of agricultural enterprises, integrate agricultural supply chain resources and solve the financing difficulties of agricultural enterprises. We analyze the participants and functions of the ASCF mode based on e-commerce, and the contract framework of various participants when they operate in the ASCF platform in this paper. Based on the agricultural industry chain, we analyze the operation process of accounts receivable financing mode, inventory financing mode and prepayment financing mode based on E-commerce. Finally, in view of the natural risks, credit risks, logistics risks, technical risks and legal risks that may exist in ASCF based on e-commerce, the corresponding countermeasures are put forward from the aspects of dispersing natural risks, building digital credit risk assessment system, building agricultural logistics network system, improving technical risk monitoring system, and improving relevant laws and regulations policy recommendations.

Keywords: ASCF, e-commerce, digital technology

*Corresponding author

INTRODUCTION

The healthy and sustainable development of agricultural industry is closely related to the strong support of financial capital. Sufficient funds and financial support can help farmers and SMEs to improve production and operation conditions and performance. However, under the traditional credit mode, limited by the inherent weaknesses of agricultural enterprises such as long production cycle and small scale, financial institutions are difficult to meet the financing needs of farmers. Financing is difficult, expensive and slow, which are the common difficulties of agricultural enterprises. As a financing service mode close to the agricultural industry chain, ASCF relies on the credit guarantee of the core enterprises in the supply chain to help the SMEs in the supply chain obtain financial resources. Especially with the promotion of e-commerce technology, the high integration of agricultural supply chain and modern finance can better promote the transformation, upgrading and innovation of agricultural enterprises, which is of great significance to provide financial support to promote the implementation of Rural Revitalization Strategy.

ASCF is the specific application of SCF in the agricultural field. It is generally believed that it is to bind the interests between upstream and downstream enterprises and farmers, pledge intangible assets such as creditor's rights assets, inventory physical assets or intellectual property rights of agricultural enterprises, and take the income of these pledge as repayment, to providing financing services for supply, production and marketing of SMEs in the supply chain. ASCF can not only encourage poor farmers to expand production to improve their income, but also help them to get rid of financing difficulties, which has become one of the most effective micro models of rural financial poverty alleviation (Guo, Gu, & Yang, 2020). In recent years, with the promotion of Rural Revitalization Strategy, ASCF has been paid more and more attention by governments at all levels. In 2017, the general office of the State Council issued "Guidance on actively promoting innovation and application of supply chain". It is further proposed to innovate the system of agricultural industrial organization and develop the ASCF services. In April 2019, the general office of the CPC Central Committee and the general office of the State Council encouraged enterprises to rely on accounts receivable, supply chain finance, franchise and other channels for financing in the guidance on promoting the healthy development of SMEs. Although the government has been formulating various preferential policies to encourage agricultural development, due to the current low degree of agricultural industrialization, the relevant laws and regulations have not yet been established and perfected, and the policies are not comprehensive enough, the development is still relatively slow, and its innovative application and comprehensive risk prevention and control capabilities need to be improved, and there is a certain gap with the financial security required by the Rural Revitalization Strategy (Liu, 2019).

In the first half of 2020, online retail sales amounted to 5150.1 billion yuan, of which grain, oil and food accounted for 7.5%, up 40.7% year-on-year in China. The rapid development of e-commerce has not only changed the rural lifestyle, but also had a profound impact on agriculture. At the same time, e-commerce also promotes the close combination of traditional offline SCF and e-commerce platform, and promotes the online development speed of SCF. In recent years, scholars began to pay attention to the application of e-commerce in SCF. Steven (2000) proposed that B2B e-commerce market and financial field would be integrated, and the resulting business model would have a profound impact on the financial field and related services. Heng

(2001) believed that finance, banking and other fields can would bring subversive innovation and change to the development of e-commerce. Li (2007) proposed that developing supply chain finance business based on the third-party e-commerce platform can reduce financial risks and solve financing difficulties for small and medium-sized enterprises. Li (2011) proposed to analyze the E-order and e-warehouse receipt supply chain financial model based on e-commerce platform. Dou & Zheng (2019) studied that B2B supply chain finance is the business innovation of e-commerce enterprises relying on the new generation of information technology, and analyzed the theoretical framework, constraints and governance strategies of B2B supply chain finance. Zheng *et al.* (2019) thought that B2B supply chain finance was the business innovation of e-commerce enterprises in the field of supply chain finance, and discusses the operation mode and risk prevention of B2B supply chain finance.

To sum up, although the application of e-commerce in the field of supply chain finance has begun to attract scholars' attention, the application of supply chain finance based on e-commerce platform in agriculture has not been paid attention to. Therefore, based on the above research background, we analyze the significance of developing ASCF based on e-commerce, explores the operation design of ASCF mode, and studies the innovation of ASCF based on e-commerce platform in this paper. Finally, in view of the various risks that may appear in the specific application of ASCF, we further discusses the risk management mechanism of ASCF with the current situation of China in this paper, and provides new solutions for the financing difficulties of agricultural SMEs and farmers, so as to promote the development of ASCF and accelerate the process of Rural Revitalization Strategy.

THE SIGNIFICANCE OF DEVELOPING ASCF BASED ON E-COMMERCE

Driven by e-commerce and digital technology in China, ASCF has entered a new era, showing a new business form of big data, Internet of things, blockchain and artificial intelligence. ASCF based on e-commerce can effectively gather the advantageous resources such as risk control, credit enhancement, capital and so on under the collaborative effect of a variety of digital technologies, and realize the complementary advantages of multiple entities through precise connection, so as to achieve the effect of "1+1>2". In particular, the collaborative cross of digital technologies in the e-commerce platform will help agriculture break through the "information island" and technology bottleneck, which may provide credit support and risk control guarantee for more and more agricultural SMEs, and meet the capital needs of their production and operation.

Alleviating the financing difficulties of agricultural enterprises

Under the traditional mode, commercial banks and other formal financial institutions have higher financing conditions for small-scale agricultural enterprises and farmers, which is difficult to become a major help to make up for their financing demand gap. The core of supply chain finance is to speed up the capital flow of supply chain and help the upstream and downstream competitive small and medium-sized enterprises to develop. The performance measurement standard is more based on the strategic income and the reduction of industrial transaction cost (Wu *et al.*, 2016). The in-depth application of ASCF has played an important role in alleviating the plight of agricultural financing. Especially, with the continuous innovation of e-commerce and digital technology, it brings new opportunities for agricultural enterprises and farmers to apply ASCF. Due to the application of blockchain technology, big digital, cloud computing and other technologies, participants can conduct open and transparent information exchange and financial transactions on the digital financial platform. In this way, the integration of agricultural industry with SCF, e-commerce, and digital technology can greatly avoid the problems of information asymmetry, rigid processes, and expensive costs caused by traditional financial support for agriculture, and improve agricultural and rural finance supply efficiency and farmers' credit level. ASCF based on e-commerce has become an important way to make up for the current financing gap of small-scale farmers and to revitalize the development of rural industries.

Enhancing the resilience of agricultural economic development

Agricultural economic resilience means that multi-level entities such as farmers and rural areas can flexibly respond to the risk of loss caused by economic shocks, which is closely related to the agricultural economic foundation (Yu, & Zhang, 2019). In the process of agricultural production and management, it is inevitable to be affected by various natural factors, environmental factors and social factors. Therefore, improving the resilience of the agricultural economy to deal with various risks and uncertainties has become an important part of revitalizing the modern agricultural industry. Good economic support helps to form the resilience of farmers to respond to risks and enhance the resilience of agricultural economic development. For example, the Agricultural Bank of China developed the "Hui Nong e-Tong" financial service platform. As of 2019, the loan balance reached 101.84 billion yuan, "Hui Nong e-payment" covered 7.16 million farmers, and "Hui Nong e-commerce" online merchants exceeded 2.67 million (Yang, & Zheng, 2020). ASCF integrates logistics operations, business operations and financial management. With the promotion of digital technology, all information and elements are glanced on the digital platform. The government can provide financial support and production materials for farmers in the downstream of the supply chain based on the digital information database, formulate reasonable preferential policies for small and medium-sized agricultural enterprises, and financial institutions combine big data and offline credit assessment to promptly inject funds. With the help of these supports, farmers can also have more leeway to deal with unexpected situations, so the upstream of the supply chain can also get more positive feedback. Under the modernized supply chain financing model, the development potential of the agricultural industry can be maximized, and the foundation of agricultural economic development can be consolidated, the resilience of agricultural development can be enhanced, and the strategy of rural revitalization can be promoted.

Realizing the poverty reduction effect of agricultural enterprises

Promoting the development of agricultural industries in impoverished areas and the continued increase in income of poor people are important elements of the rural revitalization strategy. In 2019, the central government made clear that it is necessary to do a good job of connecting poverty alleviation and rural revitalization strategies. This puts forward higher requirements for strengthening supply chain financing and helping rural industries to be revitalized. In the practice of tackling poverty, farmers are often in a relatively weak position due to factors such as lack of collateral, weak credit guarantee capabilities, and asymmetric information. ASCF is inclusive. On the one hand, ASCF can break through the plight of credit constraints, and an effective credit linkage mechanism has been established between the main bodies of the supply chain to coordinate the relationship between all parties. It has low risks, low costs, The advantages of fast financing and other advantages have become an important means to solve the financing dilemma of agricultural small and medium-sized enterprises and individual poverty-stricken rural households, thereby promoting the poverty alleviation process. On the other hand, ASCF can achieve poverty reduction through industrial poverty alleviation. Through the big data analysis of the income level, loan demand, credit level and other information of farmers registered on the digital platform, a shared database of the government, financial institutions and other subjects is established to provide personalized choices for poverty alleviation targets (Yang, &Zheng, 2020). Each subject can provide timely support for construction and financial assistance to help agricultural small and medium-sized enterprises survive and drive the surrounding people to further reduce poverty and get rid of poverty, and be closer to the overall goal of completing the rural revitalization strategy.

Integration of agricultural supply chain resources

The important content and key areas of the rural revitalization strategy are agricultural industry innovation and reform. In the current wave of agricultural industrialization, based on big data, artificial intelligence, cloud computing and block chain, with the development of modern technologies, agricultural enterprises cross industries , Cross-regional and cross-domain diversified management will become the norm, which has a profound impact on the industrial form and development model of modern agriculture, making the internal links of the main bodies of the agricultural supply chain closer, and also for ASCF and industrial chain finance. Development provides technical conditions. The application of digital technology has spawned the emergence and development of digital financial platforms. The dominant enterprises and a series of small and medium-sized enterprises in the agricultural industry chain are concentrated on the platform. Their production factors, real trade conditions, inventory and other information are all stored on the platform and passed Cloud computing forms big data for each participant in the supply chain to view and reference, maximally connect logistics, business flow, information flow, and capital flow in the supply chain to achieve real-time sharing; At the same time, the integration of the dominant resources of each subject, through the professional division and cooperation (Lin, 2019), provides a guarantee for the better development of ASCF and the realization of Rural Revitalization Strategy..

OPERATIONAL DESIGN OF ASCF BASED ON E-COMMERCE

The penetration of e-commerce technology has brought huge changes to ASCF. The various advantageous resources attracted by the e-commerce platform are empowered by technologies such as blockchain, the Internet of Things, and big data to bring diversified services to the financing customer groups in the ASCF. The financing process of agricultural SMEs has become more efficient and convenient.

Participating entities and their functions

E-commerce platform

E-commerce platform is the center of ASCF. It is based on technologies such as big data, cloud computing, artificial intelligence and blockchain. With its own logistics, information flow, business flow, and capital flow, it integrates a large amount of trade information on the trading platform of various entities and provides customers with comprehensive services. This kind of digital platform should include core modular services, good interface and highly complementary resources (Spannoletti, Resca, & Lee, 2015), so as to build a trading place for agricultural participants, reduce friction in the process of factor flow, simplify workflow, reduce information cost, achieve reasonable risk pricing and risk control, which is conducive to the complementary resources of each subject. The platform builds a trading venue for agricultural participants, which can reduce friction in the flow of elements, simplify work procedures, reduce information costs, and achieve reasonable risk pricing and risk control, which is conducive to the complementary resource advantages of each entity.

Agricultural supply Chain Enterprises

In the entire agricultural supply chain, it is the small and medium-sized agricultural enterprises and individual farmers that are in the main position of financing demand. Although the size of small and medium-sized enterprises, such as personnel size, operation scale, and capital scale, are relatively small economic units, they occupy an important position in China's national economy. Their flexible operating mechanisms and market adaptability have become an important force for promoting economic system reform. Individual farmers are self-cultivating farmers who are engaged in agricultural production and management activities in the form of household contracting management. Since ancient times, they have played an irreplaceable role in ensuring people's livelihood. Due to its own limitations, the financing needs of small and medium-sized enterprises and farmers have conflicted with the actual painful and difficult financing needs, and has always been in a weak financing position. The emergence of ASCF has compensated to a certain extent for the traditional financial institutions' structural deficiencies in financing services. The vertical aspect is conducive to close contact with enterprises, farmers and consumers, reducing the friction costs of various links, and the horizontal aspect is conducive to refinement. Industrial division

of labor and the integration of fragmented processes have laid a solid foundation for the development of agricultural industrialization.

Service Provider

Service providers mainly include financial institutions, logistics companies and other service providers. Financial institutions such as commercial banks and P2P platforms have strong advantages in terms of funds and customer sources, and have rich experience in risk management and control, which can provide financial products and capital support for financing demand subjects. The third-party logistics company is the most important link in the offline closed loop, and is essential for the smooth operation of the entire supply chain. Logistics companies provide comprehensive third-party logistics services such as collateral storage, supervision services, warehousing services, logistics and transportation services, and build a bridge between financial institutions and enterprises. Other service providers mainly include two types. One is to provide technical support and daily maintenance and repair services for building platforms relying on big data, cloud computing, artificial intelligence, block chain and other technologies, which seems to be out of the supply chain financing. But an indispensable subject. The second is government departments, which generally guide and support supply chain enterprises by formulating policies.

Operation contract

ASCF mainly relies on industry focus enterprises and other credit guarantee service entities with superior resources in the supply chain to provide a service mode for financing small and medium-sized agricultural enterprises in the upstream and downstream of the agricultural industry chain. Its operation mainly depends on the following four sets of contracts: First, the e-commerce platform signs contracts with agricultural industry chain enterprises, financial institutions, logistics companies and other service departments. The platform provides trading venues for various participating entities. Agricultural enterprises conduct order issuance, contract signing, payment settlement, logistics and other transactions on the platform. Service agencies provide various services for agricultural enterprises. Each service entity operates in an orderly manner according to the rules agreed by the platform and play their own service functions. Second, the agricultural industry chain enterprises signed contracts with various service agencies. According to the treaty, agricultural industry chain enterprises submit service applications to commercial banks, third-party logistics companies, technical service providers, and government service departments. Various service agencies provide financial, logistics, transportation, warehousing, technical support, and other services for agricultural industry chain enterprises. Related services, and charge interest, service fees or commissions. Third, contracts are signed between supply chain enterprises. The upstream and downstream agricultural enterprises complete various transactions based on the purchase contract, sales contract or technology transfer contract, and the transaction information deposited on the supply chain financing platform also provides supporting data for decision-making for various service providers to provide services. Fourth, contracts are signed between relevant service providers. Financial institutions, logistics companies and government departments need technical service providers to provide technical support; financial institutions need logistics companies' agricultural product inventory information, asset valuation agencies need to assess the value of intangible assets, and government departments such as water, electricity and steam, and government affairs information. The various service entities rely on each other and interact with each other to jointly build an ASCF service network. With the advancement and development of digital technology, ASCF can rely on the logistics, information flow, business flow and capital flow in the platform to increase the transparency of transactions, improve the efficiency of supply chain financing operations, and ensure the information security of all parties to the transaction. Build a trustworthy, transparent, efficient and safe supply chain financing environment (Wen, 2019).

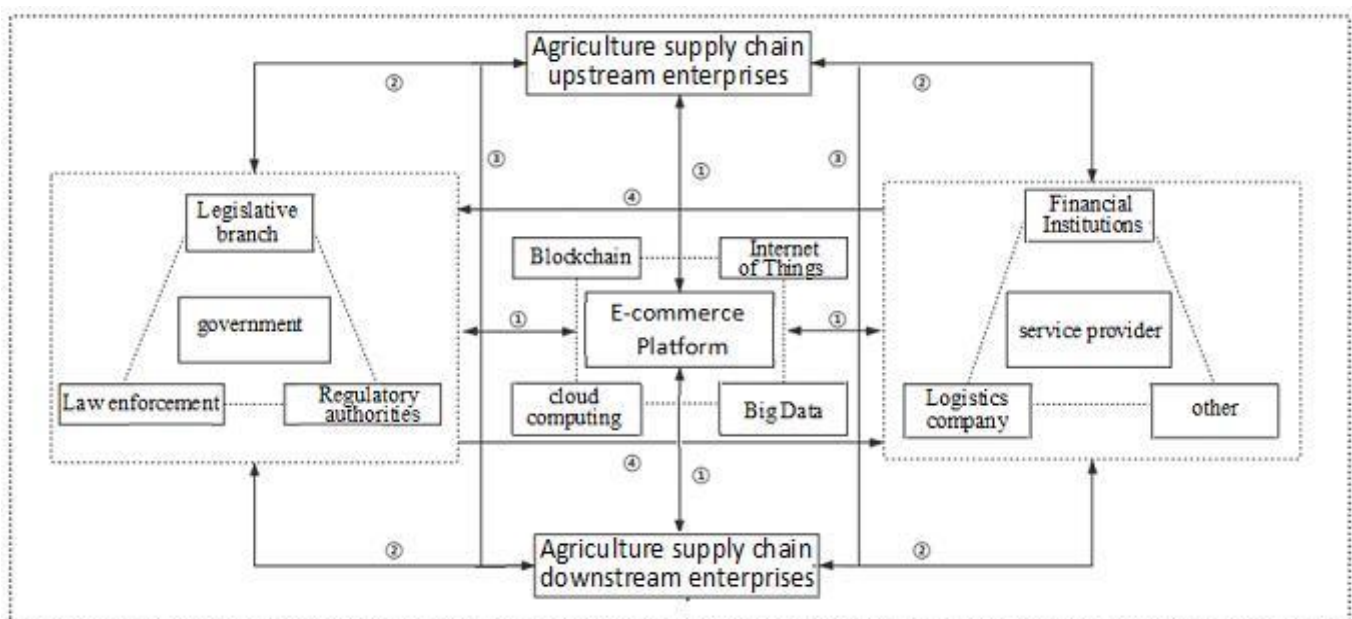


Figure 1: Network structure of ASCF based on e-commerce

MODE DESIGN OF ASCF BASED ON E-COMMERCE

With the development and popularization of e-commerce, huge changes have taken place in all walks of life in society. The innovative combination of e-commerce and traditional ASCF has also become the only way to promote the further development of ASCF and realize rural revitalization.

Accounts receivable financing mode of based on e-commerce

The accounts receivable financing mode is a financing method in which accounts receivable serve as pledges. This mode usually occurs in the sales link. Agricultural suppliers in the upstream of the supply chain have formed a large number of accounts receivable, and there is pressure on capital turnover, so they will obtain financing with the guarantee of future sales income. As shown in Figure 2, the operation flow of accounts receivable financing mode based on e-commerce is as follows.

- (1) Agricultural enterprises sign sales contracts with downstream distributors through e-commerce platforms, and apply for financing online with accounts receivable as pledges;
- (2) The e-commerce platform relies on blockchain, big data and other technologies to analyze and evaluate the true operating conditions, credit levels, and repayment capabilities of agricultural enterprises, and form reports and databases for people to consult;
- (3) Commercial banks, P2P platforms and other financial institutions use the reports provided by e-commerce platform and the customer information they own as the basis for credit investigation to determine whether the financing conditions are met;
- (4) If the financing conditions are met, the financial institution authorizes the platform payment settlement center to pay the financing amount to the enterprise;
- (5) After the receivables are due, the downstream distributors will repay the money to the platform payment settlement center, and the settlement center will repay the principal and interest of the financial institution.
- (6) When the financial institution receives the principal and interest, the current account receivable financing contract is completed.

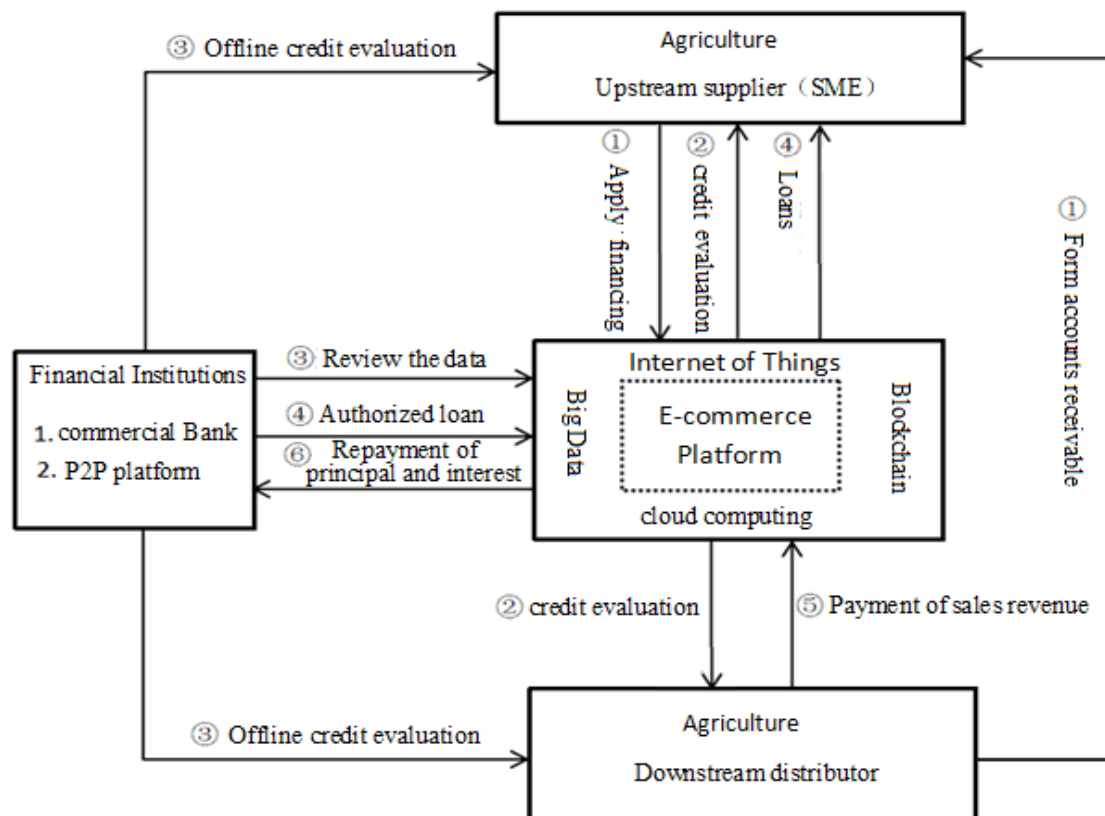


Figure 2: Operation process of accounts receivable financing mode based on e-commerce

Inventory financing mode based on e-commerce

The emergence of inventory financing model mainly stems from the small and medium-sized agricultural enterprises in the operation process, in order to ensure stability, often store a large number of primary agricultural products, production materials, etc. to cope with market fluctuations. However, this also makes it difficult for SMEs to face difficulties in capital turnover. Therefore, agricultural enterprises use inventories as collateral and use the future inventory sales revenue as a source of repayment to apply for financing from the fund supplier. The operation design of inventory financing mode based on e-commerce is shown in Figure 3.

- (1) Agricultural companies use stored inventory to send financing requests to financial institutions on the e-commerce platform;
- (2) The platform side uses big data, block chain, Internet of Things and other digital technologies to enter the inventory

- information and operation status of agricultural enterprises into the database and form an assessment report;
- (3) Financial institutions use the reports provided by the platform and the customer information they own as the basis for credit investigation to determine whether the financing conditions are met;
- (4) If the financing conditions are met, the financial institution authorizes the platform to pay the settlement center and agrees that the platform will pay the financing to the enterprise; at this time, the platform signs a pledge contract with the agricultural enterprise and requires the enterprise to transfer the inventory as pledge to the designated city Third-party logistics company;
- (5) The third-party logistics company will check this batch of inventory into the warehouse, and provide services such as inventory storage and supervision, and report the inventory status to the platform in real time;
- (6) Pay the settlement center on the platform, and the settlement center pays the principal and interest of the financial institution; if the agricultural enterprise adopts the redemption method, the third-party logistics company will return it to the enterprise;
- (7) After the financial institution receives the principal and interest, the inventory financing contract is completed.

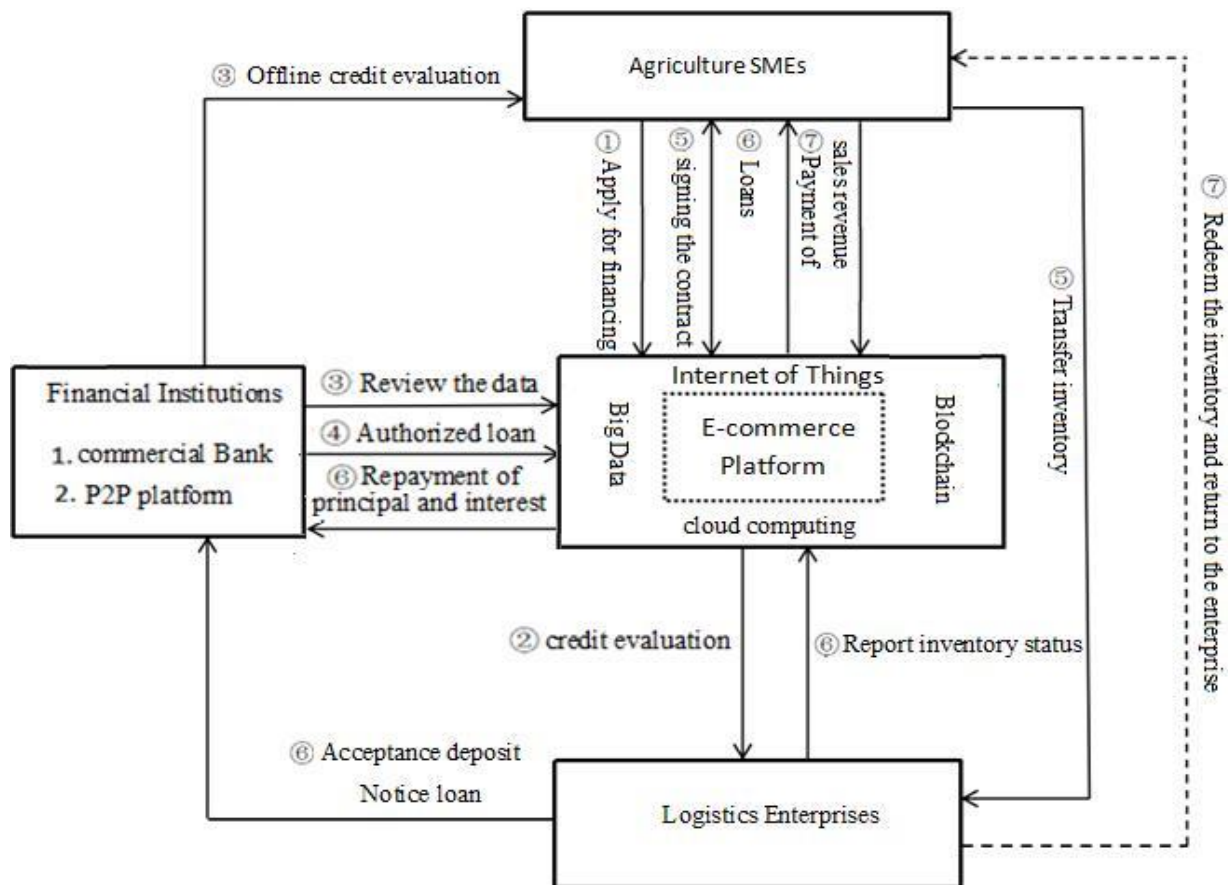


Figure 3: Operation process of inventory financing mode based on e-commerce

Prepayment account financing mode based on e-commerce

The prepaid account financing mode mainly emphasizes that agricultural enterprises sign repurchase agreements with upstream suppliers in the supply chain through digital trading platforms, in order to apply for loans from financial institutions, use prepaid accounts as collateral, and use future sales revenue as the source of repayment (Dou, Gao, & Zheng, 2020). Prepaid account financing mode based on e-commerce includes the operation steps in Figure 4.

- (1) Agricultural enterprises and upstream suppliers sign purchase and sales agreements, and use prepaid accounts as collateral to apply for prepaid account financing online;
- (2) The e-commerce platform relies on digital technology to collect relevant enterprise transaction information, conduct integrated calculation and analysis of transaction data, form an evaluation report and store it in the database;
- (3) Financial institutions use the reports provided by the platform and the customer information they own as the basis for credit investigation to determine whether the financing conditions are met;
- (4) If the financing conditions are met, the financial institution authorizes the platform payment settlement center to pay the financing money to the enterprise; the platform signs a repurchase agreement with the upstream supplier and a regulatory agreement with the third-party logistics company;
- (5) The platform informs the upstream supplier to send the goods to the designated warehouse of the third-party logistics company. The logistics company collects the goods information through the Internet of Things and other technologies, and reports the goods information to the platform immediately;
- (6) Small and medium-sized enterprises pay a certain percentage of the deposit, and financial institutions notify third-party logistics companies to give agricultural companies the right to pick up goods of corresponding value;

(7) During the stipulated period, if the downstream distributor completes the sales of the acceptance amount, the upstream distributor will repurchase the unsold goods, and this prepayment financing contract is completed.

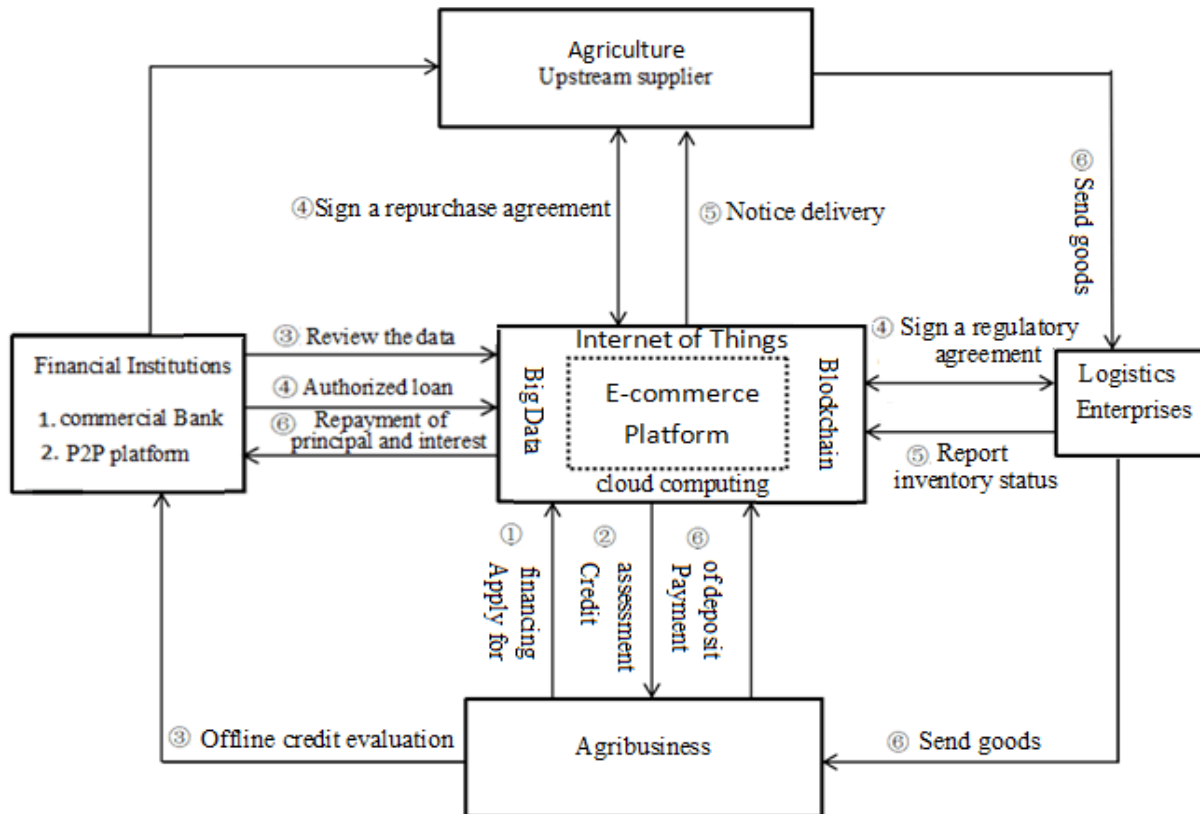


Figure 4: Operation process of prepaid account financing mode based on e-commerce

RISK ANALYSIS OF ASCF ON E-COMMERCE

At present, the application of e-commerce in the agricultural field is still in the initial stage of development. ASCF has two major attributes, industrial and financial, and has to face dual risks from industry and finance. At the same time, the integration and application capabilities of digital technology in e-commerce platforms are relatively weak, as well as the imperfect system of relevant laws and regulations, which have become important aspects that restrict the quality and efficiency of agricultural services.

Natural risks

In crop production, the main risks are natural risks. The occurrence of natural disasters is one of the important factors affecting agricultural development. my country's climate is complex and diverse, with droughts, floods, typhoons, prolonged periods of low and high temperature weather, and disease and insect disasters. After the natural disasters, farmers are unable to guarantee the supply of agricultural products to upstream suppliers due to force majeure, which will cause a series of economic losses. After farmers and small and medium-sized enterprises have lost the basis for survival, they are unable to repay credit loans provided by financial institutions such as commercial banks and Internet platforms, and financial institutions will face the risk of bad debts (Wang, 2019).

Credit risks

Due to information asymmetry, it is not uncommon for farmers to defraud loans and misappropriate funds. Compared with other collaterals, the prices of agricultural products are relatively stable and low, and they are also difficult to preserve and easy to wear. As a result, farmers lack suitable collateral, and some people tend to obtain funds through Internet financial platforms. However, these platforms lack the support of direct information in the process of loan qualification review. They can only be determined by obtaining "soft information" from social networks such as relatives and friends of the borrower, and it is not difficult to understand the frauds that exist. Moral hazards of fraudulent loans by farmers are also not uncommon (He, &Liu, 2018). After obtaining loans, some farmers will use the loans for purposes other than agricultural production, and even refuse to repay the loans after maturity, resulting in great credit risk.

Logistics risks

Affected by consumers' demand for fresh agricultural products, the transportation process has extremely high requirements on the temperature and time of the logistics link to ensure that the agricultural products will not deteriorate and rot. However, due to the fact that the development of logistics in my country is not long, and the supporting facilities are not perfect, there are many risks in the logistics link of agricultural products. In the transportation link, due to the lack of professional talents and technological innovation, unnecessary transportation costs have increased greatly. In the loading and unloading process, China

currently mainly relies on manual handling, wasting a lot of time and labor resources; and it is inevitable that damage will occur in the process of handling. In the warehousing process, because the current refrigeration technology is still relatively backward compared to foreign countries, the warehouse equipped with refrigeration equipment consumes much energy and makes a lot of noise, which affects the normal lives of surrounding residents and even pollutes the environment. In the processing and packaging process, the quality of agricultural products may be affected because the process cannot be guaranteed to be completed in a low temperature environment, and the shelf life cannot be guaranteed. In the distribution process, since the information sharing mechanism has not been fully established, there may be a lack of effective communication and exchanges with customers during the distribution process, causing some misunderstandings.

Technical risks

The e-commerce platform is the intermediary of the exchange transactions between the main bodies of the supply chain, and is the core and center of the agricultural supply chain. The platform relies on digital technology, which will inevitably produce technical risks. Technical risks include network system vulnerabilities, low professional qualities of personnel, and fraud, etc. For example, the platform is hacked or the system fails, resulting in the platform being unusable for a period of time, which will bring great economic losses; the transaction personnel are in the process of operation errors or irregular operations may also cause losses; in the process of application, review, credit, and management, the enterprise conceals its real trade background, and the platform fails to review the information errors or system failures, due to false Miscalculate the credit limit due to information, and the platform does not effectively and timely track and manage the funds after the loan is issued. Various actions may cause risks. That is, the degree of technical risk depends on the professional level of technical staff, the quality of data information, and the operation of the network system. Stationary and sharing of factor endowments (Liu, & Cheng, 2013). As the operation process of digital supply chain financing is more complicated, there are many participants, and they are interlocked. Therefore, insufficient implementation of any link may lead to business risks.

Legal risks

The current legal system related to ASCF based on e-commerce is not sound and cannot fully meet the standardized needs of related business development. The operation process is not standardized, the risk of non-compliance and non-compliance caused by non-compliance, various business operations cannot be followed and other policy and legal risks are emerging (Xu, & He, 2020). At the same time, the supervision of the ASCF platform by relevant departments is still lacking, and most of them rely on industry autonomy and lack of effective management, which also leads to certain legal risks. The supply chain financing business involves the interests of multiple parties. If there is no law to enforce the constraints, there may be industry chaos that the platform uses its own advantages to infringe on the rights of other parties.

COUNTERMEASURE OF RISK MANAGEMENT AND CONTROL OF ASCF BASED ON E-COMMERCE

Problems such as insufficient credit, weak logistics supervision, low technical ability, and lack of legal supervision have become obstacles to prevent the high-quality development of ASCF and to feed back rural revitalization strategies. In order to solve the above risks, it is necessary to implement corresponding risk management and control measures against the above problems. This article proposes the following countermeasures against the various risks that exist in ASCF, as shown in the figure 5.

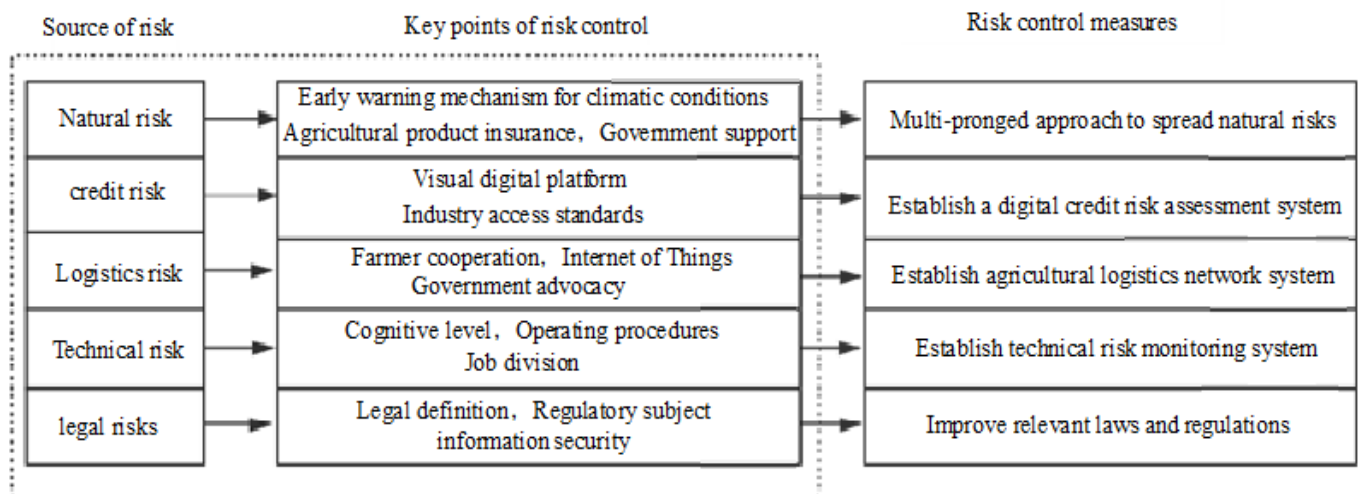


Figure 5: Risk control analysis of ASCF based on e-commerce

Multi-pronged approach to spread natural risks

In the current new stage of modernization development, the inherent vulnerability of agriculture is more obvious. Financial institutions or small and medium-sized enterprises, farmers and other entities cannot deal with possible risks alone, and multiple entities must work together to jointly resist the negative effects of natural risks. influences. Because the risks brought by force majeure such as climatic conditions cannot be completely avoided, it is mainly engaged in two aspects of pre-

prevention and post-event support. The precautions can be divided into two aspects. On the one hand, a risk control team is established within the enterprise, and a climate condition early warning mechanism is established to analyze and predict the climate at all times to increase the sensitivity to climate risks. When the climate changes abnormally, take precautions in advance to minimize the loss. On the other hand, the introduction of agricultural products insurance, guarantees and other risk protection mechanisms to diversify natural risks, to a certain extent, protect the interests of supply chain enterprises, improve the supply chain enterprises' ability to respond to natural risks. For post-event support, China has always upheld the principle of combining market leadership and government guidance. The government can contribute to the construction and improvement of agricultural infrastructure to optimize the production environment of farmers; when natural disasters and other force majeure factors occur, a subsidy mechanism is established, such as the establishment of a minimum purchase price, and government-funded acquisition of agricultural products to protect farmers' production enthusiasm; incentives Financial institutions are constantly innovating and introducing financial products suitable for small and medium-sized enterprises and farmers; they can also directly contribute to support or establish agricultural insurance companies, rural cooperatives, etc., and play the supervisory role of relevant departments, coordinate relations between all parties, and jointly undertake production operations with other entities Risks in the process, improve the level of agricultural supply chain management, participate in the maintenance of ASCF from both hardware facilities and software policies, and provide a way to solve the problems of agricultural and rural farmers, diversify risks in the development process, and promote the process of rural revitalization strategy.

Construction of a digital credit evaluation system

The most fundamental reason for the occurrence of credit risk is that the information flow is gradually reduced by each node in the supply chain circulation process, resulting in asymmetric information obtained from above and below, which creates credit risk. Therefore, on the one hand, we must use big data, Internet of Things, block chain and other digital technologies to build a visual digital platform, optimize and improve the information flow environment in the supply chain, and enhance the information liquidity, reduce the loss of information flow, and let the various users of the platform Subjects can consult information transfer information and conclude transactions through the platform database to increase transaction transparency and mutual trust between parties. On the other hand, the government should formulate relevant industry access standards, strengthen the management of credit access for agricultural supply chain entities, evaluate the enterprises and institutions applying for entry into the supply chain based on the overall operation status of the agricultural supply chain, and assess the business of each entity in the supply chain. Capacity, performance, etc. are evaluated, and the credit risk of each subject is comprehensively evaluated, thereby creating an efficient and safe ASCF environment.

Construction of agricultural logistics network system

The diversified cooperation between the agricultural industry and the logistics industry is an inevitable trend of innovative agricultural supply chains under the current digital environment, and the formation of a complete logistics network system requires the participation of relevant enterprises, governments and other subjects. First, agricultural enterprises should actively respond to the construction of the logistics network, actively accept the connection of the logistics system, and make reasonable plans for the cultivation of agricultural products according to the existing logistics infrastructure (Hu, 2017). Second, logistics companies have made technological innovations, introduced digital technologies such as the Internet of Things and block chain, and established logistics industry alliances, so that the logistics facilities of various companies in the industry can be explored and shared to the maximum extent and form a wider coverage. The logistics network system with stronger logistics warehousing capacity enables the healthy development of the logistics system under the monitoring of the Internet of Things technology. Third, the government should actively advocate the construction of a diversified logistics network system, and can also introduce relevant policies to encourage the construction of a diversified logistics system, including preferential policies for logistics companies and agricultural enterprises. Since food safety issues have always been the top priority of people's attention, it is also necessary to formulate industry unified technical standards as soon as possible, guide the orderly and healthy development of ASCF, and provide stable and reliable support for the revitalization of rural industries.

Improvement of the technical risk monitoring system

The supply chain financing operation process is complicated and interlocking. The ASCF platform should design a reasonable business process based on the business characteristics of ASCF. By setting up special business departments, formulating special operation guidelines, and establishing a sound internal control management system, we can realize the technical risks that may exist in each link. Effective control (Zhou, 2019). First, strengthen the publicity of the combination of digitalization and ASCF, focus on improving the level of awareness of the participating entities in digital ASCF, and promote the popularization of digital technology in the operation process. Considering that the blockchain technology has great potential to solve the bottleneck problems of low visualization of transaction process, easy data tampering, limited credit object and high monitoring cost (Saber *et al.*, 2019), the application of blockchain technology in order financing, prepayment financing and accounts receivable financing should be expanded (Hofmann, Stewe, & Bosia, 2018). Second, refine the operational guidance of each link and put forward clear operational requirements. In the review stage, a special investigation template is developed, and the staff collects information based on the template to reduce the possibility of the enterprise concealing its true trade background; in the credit granting stage, it is clear that the agreement is signed with the credit main body and its upstream and downstream enterprises, electronic signatures, bill instruments The execution points and requirements of the delivery and execution of business, etc., to reduce the risks caused by operational errors and irregularities; in the post-loan management

stage, the operational procedures and key points of attention should be drawn up for various matters such as fund payment, collateral supervision, and loan recovery. So that staff can be managed according to specifications. Third, establish a special risk management department and special posts, and clarify the division of labor between each post, so that each post can cooperate with each other while supervising each other, and realize the specialized and standardized operation of ASCF.

Improvement of relevant laws and regulations

While ASCF promotes the development of agricultural industry and the strategy of rural revitalization, it will also face the blank area that has not been stipulated by law, resulting in various legal disputes. First of all, the national legislature needs to introduce and improve the corresponding laws and regulations, and clarify the legal definition. For example, relevant chapters have been added to the "E-commerce Law" to make up for the lack of definition of legal concepts such as pledge rights and security rights in supply chain financing, ownership of property rights, and registration systems. Secondly, there are no corresponding laws and regulations on the ASCF platform, and there is a lack of legal binding force. There is also a lack of supervision on the cross-business of financial institutions and logistics companies, which requires the legislative department to draft Laws and regulations, protect the rights of each subject, stipulate the obligations of each subject, clarify the regulatory subject, establish and improve a reasonable and effective regulatory mechanism to meet the development requirements of ASCF. Finally, relevant laws and regulations on protecting information security and personal privacy should also be updated to apply to the general background of the continuous development of digital technology and maintain the normal order of the agricultural supply chain.

CONCLUSION

At present, the rapid development of e-commerce has not only changed the way of life in agricultural and rural areas, but also has a profound impact on the agricultural field in China. The combination of early offline ASCF and e-commerce platforms made the financing process more convenient, faster, safer and more efficient. We propose that the development of ASCF based on the e-commerce platform can not only alleviate the financing difficulties of agricultural enterprises, enhance the resilience of agricultural economic development, but also realize the poverty reduction effect of agricultural enterprises and integrate agricultural supply chain resources in this paper. Based on the e-commerce platform, we analyze the accounts receivable finance mode, inventory finance mode and prepaid account mode in this paper. In addition, in view of the natural risks, credit risks, logistics risks, technical risks and legal risks that may exist in the operation of these financing modes, we have proposed a risk management mechanism ASCF based on the e-commerce platform, which may provide new solutions for agricultural small and medium-sized enterprises and farmers to overcome financing difficulties, so as to promote the development of agriculture and accelerate the process of rural revitalization strategies.

ACKNOWLEDGMENT

This work was financially supported by major projects of innovation fund of Nanjing Institute of Technology 2020: Research on innovation and promotion path of credit agglomeration mode of Jiangsu agricultural supply chain finance under the background of new infrastructure construction (CKJA202004), China; finance development special fund project of applied research fine engineering of social sciences of Jiangsu province 2019: Research on the realization path of "going out" of private enterprises in Jiangsu province with digital supply chain finance precision service under the strategy of "one belt and one way" (19SCB-015), China.

REFERENCES

- [1] Dou Y.Q., Gao X., & Zheng M.X. (2020). Digital supply chain financing and innovation of financing mode for technology enterprises. *Science and Technology Management Research*, 40(8): 112-119. doi: 10.3969/j.issn.1000-7695.2020.8.015 (in Chinese).
- [2] Dou, Y. Q., & Zheng, M. X. (2019). Research on theoretical framework, conditional constraints and governance strategies of B2B supply chain finance. *Journal of Nanjing Institute of Technology (Social Science Edition)*, 19(2), 46-51. doi: 10.13960/j.issn.2096-238 X.2019.02.009
- [3] Guo J., Gu L.Y., & Yang L.C. (2020). Poverty Alleviation of Agricultural Supply Chain Finance in China: Review and Retrospect. *Journal of Beijing Jiaotong University (Social Science Edition)*, 19(01), 106-113. doi: 10.16797/j.cnki.11-5224/c.20200106.010 (in Chinese).
- [4] He G.W., & Liu T. (2018). Rural financial predicament and innovative choice based on rural revitalization perspective. *Academics*, 32(10): 46-55. doi: 10.3969/j.issn.1002-1698.2018.10.005 (in Chinese).
- [5] Heng, M. S. (2001). Implications of e-commerce for banking and finance. In *Towards the E-Society* (pp. 317-327). Springer, Boston, MA. doi: 10.1007/0-306-47009-8_22
- [6] Hofmann, E., Strewé, U. M., & Bosia, N. (2018). Discussion—how does the full potential of blockchain technology in supply chain finance look like? In *Supply Chain Finance and Blockchain Technology* (pp. 77-87). Springer, Cham. doi: 10.1007/978-3-319-62371-9_6
- [7] Hu J.M. (2017). Problems and countermeasures of the development of cold chain logistics of fresh agricultural products in my country. *Reform and Strategy*, 33(5): 82-84. doi: 10.16331/j.cnki.issn1002-736x.2017.05.024 010 (in Chinese).
- [8] Kaplan, S., & Sawhney, M. (2000). E-hubs: the new B2B marketplaces. *Harvard Business Review*, 78(3), 97-97.
- [9] Li, W. J., & Ma, H. W. (2011). Analysis of supply chain financing based on the B2B e-commerce. *Science-Technology and Management*, 13(4), 68-72. doi: 10.16315/j.stm.2011.04.030

- [10] Lin G.Y. (2019). Research on supply chain integration of fresh agricultural products based on "new retail". *Modern Agriculture Research*, 4(9): 139-140. doi: 10.19704/j.cnki.xdnyyj.2019.09.057 (in Chinese).
- [11] Liu G. (2019). Study on the strategy of financial aid for rural revitalization in internet supply chain. *Theoretical Investigation*, (06):118-123. doi: 10.16354/j.cnki.23-1013/d.2019.06.019 010 (in Chinese).
- [12] Liu X.C., & Cheng E.J. (2013). China agricultural industry chain financing mode-typical cases and theoretical implications. *Finance & Trade Economics*, 34(8): 47-57. doi: 10.19795/j.cnki.cn11-1166/f.2013.08.005 (in Chinese).
- [13] Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L. (2019). Blockchain technology and its relationships to sustainable supply chain management. *International Journal of Production Research*, 57(7), 2117-2135. doi: 10.1080/00207543.2018.1533261
- [14] Spagnoletti, P., Resca, A., & Lee, G. (2015). A design theory for digital platforms supporting online communities: a multiple case study. *Journal of Information technology*, 30(4), 364-380. doi: 10.1057/jit.2014.37
- [15] Wang S.G. (2019). Current status of agricultural and rural finance and agricultural industry. *Rural Finance Research*, 39 (7): 7-8. doi: 10.16127/j.cnki.issn1003-1812.2019.11.001 (in Chinese).
- [16] Wen F. (2019). Exploring innovative practice of smart supply chain financing. *China Forex*, 27(24): 48-50. doi: 10.13539/j.cnki.11-5475/f.2019.24.016 (in Chinese).
- [17] Wu, L., Yue, X., Jin, A., & Yen, D. C. (2016). Smart supply chain management: A review and implications for future research. *The International Journal of Logistics Management*, 27(2), 395-417. doi: 10.1108/IJLM-02-2014-0035.
- [18] Xu Z.Z., & He Y.S. (2020). Research on the model of agricultural smart supply chain under the strategy of rural revitalization. *Logistics Engineering and Management*, 42(02),32-34. doi: 10.3969/j.issn.1674-4993.2020.02.011 (in Chinese).
- [19] Yang M., & Zheng C.G. (2020). Application of the blockchain to targeted poverty alleviation. *Journal of Yunnan Minzu University (Social Sciences)*, 37(2), 82-87. doi: 10.13727/j.cnki.53-1191/c.20200313.019 (in Chinese).
- [20] Yu W., & Zhang P. (2019). Research on the characteristics of spatial and temporal differentiation and influencing factors of China's agricultural development resilience. *Geography and Geo-information Science*, 35(1), 102-108. doi: 10.3969/j.issn. 1672-0504.2019.01.016 (in Chinese).
- [21] Zheng Q.M., Dou Y.Q., Wu Y.S. & Shi Y.D. (2019). Research on operation mode and risk prevention of B2B supply chain finance. In *Proceedings of The 19th International Conference on Electronic Business* (pp. 373-380). ICEB, Newcastle upon Tyne, UK, December 8-12
- [22] Zhou R.Y. (2019). Research on the Risk Management Mode and Innovation of Internet Supply Chain Financing--Taking JD Finance as an Example. Zhejiang University, Hangzhou, Zhejiang. doi: 10.27461/d.cnki.gzjdx.2019.000325 (in Chinese).