Research on Digital Credit Behavior of Farmers’ Cooperatives—A Grounded Theory Analysis Based on the “6C” Family Model

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Abstract: As the main demand side of rural financial services, farmers’ cooperatives are an important part of China’s rural finance. However, due to the lack of effective collateral, farmers’ cooperatives have problems such as difficulty in obtaining loans or expensive loans, which not only hinder the high-quality development of farmers’ cooperatives, but also limit the development of regional rural finance. Digital credit as a new financing model can effectively alleviate the problems of difficult and expensive loans and has received wide attention from the government and academia. Based on this, this paper analyzes the digital credit behavior of farmers’ cooperatives in detail by applying the “6C” family model to the grounded theory, and constructs a theoretical analysis model of farmers’ cooperatives’ digital credit behavior. The findings are as follows: The motivation for the digital credit of farmers’ cooperatives is that the credit procedures are simple, the loan period is short, and the loan interest rate is low; the condition is farmers’ cooperative reputation advantage and government policy support; the main form is the participation of cooperatives in short- and long-cycle digital credit; and the consequence is reflected in increasing the income of cooperative members, improving the availability of cooperative loans, promoting cooperative credit building, and achieving sustainable agricultural development. Different participation motivations have different effects on the form of credit. When motivated by simple credit procedures and short loan periods, farmers’ cooperatives choose “Huinong e-loan”; when motivated by simple procedures and low loan interest rates, farmers’ cooperatives choose “Funong Loan”. Different forms of credit will produce different performances. Farmers’ cooperatives choosing “Huinong e-loan” will produce economic performance; farmers’ cooperatives choosing “Funong Loan” will produce economic performance and social performance. In order to deal with the problem of digital credit of farmers’ cooperatives, the government needs to improve the relevant policies and regulations, reduce credit risks, and establish a sound credit system to provide credit guarantees for cooperatives and farmers. Financial institutions need to improve their financial services and innovate financial products and services to meet the multi-level credit needs of cooperatives.

Keywords: farmers’ cooperatives; digital credit; 6C family model; grounded theory; behavioral research

1. Introduction

Farmers’ cooperatives, as one of the emerging new types of agricultural businesses, are economic organizations that are “run, owned, managed, and benefited by the people” and solve the problem of uneven opportunities for disadvantaged groups in obtaining social resources by means of “unity of the weak” and have played a crucial role in enhancing farmers’ income and improving their livelihoods. They serve as a significant force in
driving supply-side structural reform in agriculture and facilitating high-quality development [1–3]. The economic characteristics of voluntary association, democratic management, economic mutual assistance, and risk sharing presented in the formation of farmers’ cooperatives are also compatible with the concept of modern Chinese agriculture that realizes resource sharing, risk sharing, and benefit sharing. However, this way of “sticking together” can improve the status and bargaining power of the farmer group, and effectively solve some problems in the allocation of social resources. But, limited by the weak nature of agriculture, farmers’ cooperatives are hindered in the flow of funds, which is mainly reflected in the difficulty of financing in traditional credit [4,5]. Firstly, there is a lack of collateral and guarantees. Due to the small-scale operations and predominantly collectively owned assets, farmers’ cooperatives face challenges in providing adequate collateral or guarantees to secure a loan [6]. Secondly, the management system is small-scale and incomplete. During the development process of farmers’ cooperatives, there are problems such as imperfect management systems and outdated business philosophies, which are also important factors that banks and financial institutions should consider when considering whether to provide loans [7]. Thirdly, there is information asymmetry. Banks and financial institutions may not be familiar with the operating model of farmers’ cooperatives, which could lead to issues of information asymmetry when evaluating loan applications from these cooperatives [8]. Fourthly, the loan conditions are stringent. Banks and financial institutions may set strict loan conditions for farmers’ cooperatives, such as high interest rates and short repayment terms, which may increase the financial burden on farmers’ cooperatives and make it difficult for them to apply for loans [9].

In the context of informatization, digital credit is a new engine for economic and financial development, and an important means to bridge the digital divide and address issues of unbalanced and insufficient development [10,11]. The exploration and practice of digital lending in the field of agriculture have not only promoted the modernization and upgrade of traditional agriculture in China, but also injected new vitality into it. Furthermore, it has become a significant force under the rural revitalization strategy [12,13]. Digital credit is based on big data and cloud computing, supported by legal digital currency, and characterized by new transaction models and regulatory methods. By leveraging the advantages of financial technology, it seeks to reform and innovate traditional bank lending businesses, thereby constructing an entirely new financial ecosystem. Digital credit, through the use of the Internet, big data, and other digital technologies, addresses the problem of information asymmetry within and among farmers’ cooperatives. It enhances the efficiency of resource allocation and operations, becoming an important direction for the financing of these cooperatives. Therefore, digital credit is different from traditional credit. In terms of information transmission efficiency, digital credit realizes the interconnection of information and the environment between subjects. Compared with traditional credit, digital credit can realize the barrier-free flow of information flow, business flow, credit flow, and capital flow between systems, which can better alleviate the interference of information asymmetry in the credit process. In terms of business division, digital credit places more emphasis on specialized division of labor and socialized collaboration. Through resource sharing and complementary advantages, it disperses operational risks, reduces production costs, and maximizes the benefits of the collaboration chain. In terms of data utilization, digital credit has achieved massive data analysis based on traditional credit data analysis. This analysis is not limited to the traditional simple and mechanical subject information analysis, and is preferentially applied to the marketing, perception, decision-making, division of labor, reaction, and service of the collection of multi-source data. Digital credit will also use daily dynamic data mining to accurately locate customers and grasp customer loan needs to formulate efficient service and marketing strategies. In terms of digital empowerment, digital credit has solved the thorny problems in the traditional credit process with the support of digital technology, which is mainly reflected in the realization of digital empowerment functions. The first is to realize the cross-time-space function of credit transactions, such as electronic contracts,
information processing systems, and payment settlement systems, which can fully solve the harsh conditions of offline transactions and realize cross-time-space credit transactions. The second is to achieve business security operations, such as OCR identification and biometric technology can identify human characteristics, identity information, and easily resolve operational risks and moral risks in credit business.

In order to promote the development of digital credit, the Chinese government has issued related policies. On the one hand, they have continuously improved the credit regime and system serving agriculture. In 2021, the “Opinions on Financial Support for the Development of New Agricultural Business Entities” jointly issued by the Central Agricultural Office and seven other departments pointed out that it is necessary to relax the loan requirements for agricultural enterprises and expand the scope of mortgages and pledges. In addition, not only is it necessary to innovate the exclusive services of agricultural business entities, separately list credit plans for new agricultural business entities, appropriately decentralize the approval authority, and give appropriate preference to internal transfer pricing, but it is also necessary to improve the compensation mechanism, and support government financing guarantee institutions and banking financial institutions to jointly create product models such as “loan upon guarantee” and “guarantee upon loan” under the premise of sharing risks. The report of the 20th National Congress of the Communist Party of China proposed to “improve the agricultural support and protection system, and improve the rural financial service system” and has further put forward the strategic policy of promoting credit reform. On the other hand, they have continuously supported and encouraged the construction of digital credit. In April 2018, the General Office of the State Council of China issued the “Opinions on Further Deepening Financial Services for Small and Micro Enterprises”, requiring innovation and optimization of credit management systems and mechanisms, and actively used modern information technologies such as big data, artificial intelligence, and cloud computing to accelerate the construction of credit information sharing platforms. In August 2018, China’s Ministry of Finance and others issued the “Guiding Opinions on Financial Services for Rural Revitalization”, encouraging the use of Internet technology and information technology to develop inclusive finance. Under the government’s forward planning and strategic layout, digital credit is developing steadily. “China’s County-level Digital Inclusive Financial Development Index Report 2021” shows that the development of county-level digital financial inclusion across the country has shown an upward trend in recent years. Among them, compared with 2017, the score of digital credit service breadth in 2020 increased by more than 8 times, and the score of service depth increased by 3.8 times. Moreover, many banks, including Rural Commercial Bank and Agricultural Bank of China, are actively developing digital credit. Online financial products continue to emerge, service areas continue to expand, and service methods are gradually diversified. According to the data released by MYBank, more than 900, one-third, of China’s agriculture-related counties and district governments have reached digital inclusive financial cooperation with it. It can be seen that the open and inclusive social environment, and the excellent banking service system are important reasons for the in-depth development of China’s digital credit. Despite the good development of digital credit, agriculture is limited by its own limitations, and the development of digital credit in the agricultural field lags behind.

In the context of high-quality development of farmers’ cooperatives and wide application of information technology, this paper attempts to explore the digital credit behavior of farmers’ cooperatives from the perspective of behavioral economics. This study fills the existing literature gap in the following two aspects. First, this study focuses on farmers’ cooperatives, a new type of agricultural management entity. On the one hand, farmers’ cooperatives are an important organizational form of Chinese agriculture. According to information released by the Ministry of Agriculture and Rural Affairs, as of the end of November 2021, there were 2.219 million legally registered farmers’ cooperatives in China, encompassing nearly half of farmers. On the other hand, in-depth research on the behavior of farmers’ cooperatives’ digital credit can further identify the role of farmers’ cooperatives in rural
economic development. Second, based on the 6C family model, this study explores the context, causes, contingencies, consequences, covariances, and conditions of farmers' cooperatives' digital credit in detail, and builds a theoretical analysis model of farmers' cooperatives' digital credit behavior. This paper aims to further improve the theoretical research and practical exploration in the field of digital finance in China, construct a theoretical analysis model of farmers' cooperatives on digital credit behavior, and enrich the theoretical research system of farmers' cooperatives' financial services and financing models.

The structure of the remaining parts of this paper is as follows: the second part is the literature review, mainly introducing the research progress on the use of digital credit by households; the third part is the research design, including an introduction to grounded theory, case selection, data sources, and data analysis; the fourth part interprets the behavior of digital credit in farmer cooperatives, including the motivation, conditions, contingencies, consequences, and covariates; and the fifth part consists of conclusions, policy recommendations, and research deficiencies.

2. Literature Review

Currently, farmers in developing countries still have few opportunities to obtain credit. With the wide application of digital technology in rural finance, digital financial services have great potential to address the credit needs of farmers in remote rural areas and are rapidly expanding on a global scale. Sarfo and Musshoff [14] used a discrete choice experiment to compare farmers' willingness to pay for digital credit and traditional credit, and found that people are more willing to pay for digital credit than traditional credit. What factors influence the use of digital credit by farmer households? Income is a crucial factor for farmer households to obtain credit. By participating in e-commerce, farmer households can earn more income and thereby obtain more digital credit [15]. Yu and Xiang [16] confirmed the above conclusions based on the China Family Panel Studies database, and compared with farmers who did not participate in e-commerce, the scale of digital credit of farmers participating in e-commerce increased by CNY 922,000. Differences in capital endowment are a significant reason for the discrepancy in the scale of digital credit obtained by e-commerce farmer households [16]. Su and Peng [17] used survey data from 832 Chinese rural entrepreneurial households, finding that the impact of online buying and selling on farmers' participation in digital credit is greater among farmers with high education levels, skills training, new agricultural management entities (i.e., family farms and professional cooperatives), and agricultural entrepreneurship. Sarfo and Musshoff [18], based on survey data in rural areas of Madagascar, measured farmers' financial literacy in terms of computing power, compound interest, inflation, and risk diversification, and found that financial literacy has a positive and statistically significant impact on farmers' awareness of digital credit. Su and Peng [17] further demonstrated that financial literacy plays a moderating role in the impact of online purchases and sales on farmers' participation in digital finance. The aforementioned studies primarily focus on the impact of digital credit capacity on credit acquisition. Sarfo and Musshoff [19] used a discrete choice experiment to investigate the preferences of small farmers in Madagascar for digital credit. Under the condition of limited access to traditional credit for farmers, digital credit is more attractive to farmers if it provides lower monthly interest rates, longer loan terms, and flexible repayment terms that adapt to farmers' production needs.

With the application of digital credit, it has brought a wide-ranging and far-reaching impact on farmer households. On the economic level, Mahmood and Xia [20], based on farmer households data from the Punjab province of Pakistan, found that digital credit has a positive impact on the technical efficiency, allocation efficiency, and economic efficiency of small rice growers. Wang and Weng [21], based on survey data from 1030 professional apple growers in Shaanxi Province, found that digital finance significantly impacted the growth of professional farmers' total income, mainly achieved through agricultural production investment and farmer entrepreneurship. From a further macro perspective, Li and Wang [22], based on the sample data of 30 provinces in mainland China.
from 2011 to 2019, found that digital financial inclusion can significantly promote the growth of farmers’ income, and has a positive spatial spillover effect that varies depending on the level of provincial economic development. On the environmental level, Zhao and Zhang [23], based on the survey data of 903 apple growers in China, found that the use of digital finance has significantly increased the number of small farmers adopting SAP (Sustainable Agricultural Practices), and digital finance can reduce credit constraints and promote information access and promoting social interaction to influence smallholder farmers’ adoption of SAP. Yu and Zhao [24] used 441 family farms in Shandong and Henan provinces as examples and found that the use of digital finance positively influenced the adoption of green control technologies on family farms by improving credit availability, promoting information acquisition, and enhancing social trust. On the social level, Wang and He [25], based on survey data from 1900 farm households, found that the use of digital financial services can improve farmers’ ability to cope with risk and reduce poverty vulnerability. Yang and Wang [26] further confirm this conclusion, finding that farmers in highly developed digital inclusion (DFI) areas are less likely to fall into the poverty trap. He and Li [27] argue that digital finance stimulates farmers’ entrepreneurship and improves entrepreneurial performance through the credit constraint mechanism, information constraint mechanism, and social trust mechanism, and the impact of digital finance is mainly focused on non-farm entrepreneurship and subsistence entrepreneurship, and the impact on farm-related and developmental entrepreneurship is not significant.

Farmers’ cooperatives, with their larger scale of operation, higher level of intensification and specialization, and their higher knowledge level of the relevant people in charge, are better equipped to accept and apply new technologies, and there is basically no digital credit exclusion [28]. Song and Shi [29], based on a survey of 329 farmer cooperatives found that 76.68% of the cooperatives have capital needs, and the most demanding amount is between CNY 100,000 and CNY 500,000, accounting for 39.37%. In general, the funding gap of Chinese farmer cooperatives is still relatively large, 31.06% of the cooperatives’ self-owned funds cannot meet the needs of agricultural production and operation, and the credit constraints of cooperatives are both demand based and supply based, 60.13% are subject to supply type credit constraints, and 39.87% are subject to demand-based credit constraints, in which harsh loan conditions and transaction cost constraints are the main reasons why cooperatives are subject to supply-based constraints and demand-based constraints, respectively [30].

According to international experience, digital finance can effectively alleviate the problem of farmers’ credit difficulties. Both the Small Business Administration in the United States and the Inclusive Finance Office in the United Kingdom regard digital finance as an effective way to solve farmers’ credit problems. Digital finance has three major advantages: First, it can effectively solve the problems of insufficient information, asymmetry, and high risks faced by traditional financial institutions in providing credit business. Second, it can significantly reduce transaction costs, especially in the process of farmers’ cooperative transactions, where the information asymmetry between farmers and cooperatives is high, which can be greatly reduced through the application of digital finance. Third, it can expand the service scope of financial organizations and effectively meet the growing demand for financial services from farmers.

Specifically, through mobile devices and the Internet platform, farmers can apply for credit anytime, anywhere, with a short processing time and simple procedures. Digital credit can provide farmers with more flexible loan amounts and shorter loan terms, which can meet the diversified needs of farmers [31]. However, existing studies have paid less attention to farmers’ cooperatives in the discussion of digital credit, and there is a lack of in-depth analysis of the mechanism of digital credit behavior of farmers’ cooperatives. Therefore, based on four cooperative cases and using the analytical framework of rooting theory, this paper constructs a 6C family model between digital credit and farmers’ cooperatives to explore the behavioral mechanism of digital credit in farmers’ cooperatives in detail and provide useful reference for farmers’ cooperatives’ digital credit behavior.
3. Materials and Methods

3.1. Introduction to Grounded Theory

Grounded theory is a qualitative approach used for research questions, data analysis, theory construction, and concept formation. It treats the case study as a “problem domain”, and through the analysis of a large amount of primary data, a systematic concept of the problem is eventually developed [32,33]. Grounded theory has the advantages of authenticity, flexibility, synthesis, and problem visualization. On the one hand, it encourages researchers to place research in real situations, allowing research questions to be gradually formed in the complex and changeable research process, which not only helps to capture complex social phenomena and interrelationships, improves the credibility and reliability of research, but also to avoid over-reliance on a pre-set point of view, so that researchers can better deal with new discoveries and unexpected results. On the other hand, it not only requires multi-source data and encourages cross-validation of multi-source data, but also makes abstract problems visualize through data coding and other forms, so that it can make a researcher further understand the complexity and diversity of research objects and draw more comprehensive results and an accurate conclusion. When conducting grounded theory research, it is first necessary to clarify the problem, then place the researcher in the situation, collect data through observation and interview, and form a conceptual framework after three-level coding. Corbin and Strauss [34] argue that the application of rooting theory is not about having a theory and then verifying it, but about having a domain to be studied and then sprouting concepts and theories from that domain. The analytical flow of the grounded theory is shown in Figure 1.

![Flow of classical grounded theory](image)

**Figure 1.** Flow of classical grounded theory.

The digital credit behavior of farmer cooperatives is a complex process that is difficult to observe and understand directly. Therefore, we need to use grounded theory, a qualitative research method, to collect and analyze field data through in-depth observation and interviews. Firstly, grounded theory can help us understand how farmer cooperatives receive and apply digital credit and how these credits affect their operations and economic performance. For example, we can use interviews and observations to explore why farmer cooperatives choose to use digital credit, how they evaluate and select different credit products, and how these decisions affect their production, marketing, and investment behavior. Secondly, the grounded theory can reveal the key factors that influence the digital credit behavior of farmers’ cooperatives and the interactions among these factors. Finally, through rooting theory, we can construct a theoretical model on the digital credit behavior of farmers’ cooperatives, and this model can provide useful guidance for policy makers and financial service providers. In general, grounded theory can help us “unlock” the “black box” of digital credit behavior of farmers’ cooperatives, provide insights into the process, and generate useful theories and strategies.

3.2. Case Selection

This paper takes the farmers’ cooperatives in Pujiang County, Zhejiang Province, as an example to illustrate. Firstly, Zhejiang Province is a large agricultural province. By the end of 2022, there were 45,804 farmers’ cooperatives. It is also one of the earliest provinces
in China to carry out rural reform and agricultural modernization. And Pujiang County, as a representative county in Zhejiang Province, has a high level of agricultural and rural economic development, and the number and scale of farmers’ cooperatives are at the forefront of the country. Secondly, Zhejiang Province is an important birthplace of e-commerce and digital economy in China, with first-class network infrastructure and extensive Internet usage habits, and farmers’ cooperatives have more practical exploration and accumulated experience in digital credit. Thirdly, the selection of Pujiang County as the research object allows us to explore in depth the special situation of farmers’ cooperatives in this region, and the research results have a certain generality and applicability due to their representativeness in agricultural development and financial services. A map of Pujiang County is shown in Figure 2. Zhejiang is located on the southeast coast of China, which is shown in blue on the map, as shown on the left in Figure 1. Pujiang County is located in the middle of Zhejiang, and we show it in green, as shown in the right of Figure 1.

![Map of Pujiang County, Zhejiang Province.](image)

Finally, this study selected Pujiang County Qingshan Cattle Breeding Cooperative (later referred to as QS Cooperative), Zhejiang Province Pujiang County Xiashao Grape Cooperative (XS Cooperative), Pujiang County Lizian Fan Eco-Turkey Breeding Cooperative (LQ Cooperative), and Pujiang County Qinghe Farmers’ Cooperative (QH Cooperative) as research cases. The specific case-selection criteria are as follows: first, the cases selected are typical. The four cases selected for this study are all from Pujiang County, Jinhua City, Zhejiang Province, where the digital economy is more developed, and their experiences can provide reference for other regions. Second, the selection of cases followed the replication logic of the case studies. Among the four cases selected, QS and XS cooperatives chose to use “Huinong e-Loan”, and LQ and QH cooperatives chose to use “Funong Loan”.

Case 1: QS Cooperative was established in 2012, with 358 members, including 78 poor households, mainly breeding local cattle. According to the requirements of “unified technology, unified feed, unified epidemic prevention and unified sales”, QS Cooperative unifies the purchase of agricultural products produced by farmers and then further processes the products, forming its own unique industrial chain. QS Cooperative participated in “Huinong e-Loan” in 2020, and is an important customer of China Agricultural Bank’s
digital credit, as well as being the first farmers’ cooperative in Pujiang County to participate in “Huinong e-Loan”.

Case 2: XS Cooperative was established in 2011, integrating grape planting, processing, and sales. By implementing the development model of “enterprise + cooperative + farmers”, it has formed a mature management model and service system in planting management, technical training, and marketing. At present, XS Cooperative has become the leader in the local grape growing industry, with a planting area of 53.33 hectares, and is one of the birthplaces of “Giant Peak Grapes” in Pujiang. XS cooperative’s products have passed organic certification and green food certification, and is the first cooperative in Pujiang County to win this award, and the products are exported to Shanghai and Zhejiang, and have won the title of “Zhejiang Famous Brand Products”. Since 2021, the XS cooperative has applied for the “Huinong e-loan” from the bank and used this loan to successfully promote the development of the cooperative.

Case 3: LQ Cooperative was established in 2011, with 15 members, including 7 poor households, and a breeding area of 20 hectares, with “ecological native chicken breeding” as the main business, integrating native chicken breeding, native chicken product sales, chicken hatching, and deep processing of native chicken products. LQ Cooperative adopts the traditional ecological breeding method, adheres to the “pollution-free” and “green” road, and has now formed a complete industrial chain with the base as the core and farmers as the basis. Driven by the LQ cooperative, the surrounding farmers have vigorously developed the native chicken breeding industry, forming a large-scale breeding base. Affected by the COVID-19 pandemic, LQ cooperatives faced difficulties in selling chickens and lacked funds for feed purchases. In 2021, the cooperative applied to the Pujiang branch of the Agricultural Bank of China for the “Funong Loan” for the first time, bringing the operation of the cooperative back on track.

Case 4: QH Cooperative was established in 2021, and its members are mainly composed of impoverished farmers with limited abilities. QH Cooperative is mainly engaged in grain cultivation, vegetable cultivation and sales, and the government has organized the “agricultural products + e-commerce” model to promote the joint development of online and offline sales, which has achieved good performance. As a typical government-supported cooperative, QH Cooperative participated in the “Funong Loan” at the beginning of its establishment, and with the government’s “benefiting and supporting farmers” policy and the financial support of the Agricultural Bank of China’s “Funong Loan”, the cooperative has stepped out on its own to the road out of poverty.

3.3. Data Source

To ensure the reliability and validity of the data, the data in this study were obtained from multiple sources to form a cross-correction. First, there were informal interviews. The person in charge of Pujiang Agricultural and Commercial Bank was contacted by telephone to understand the cooperation between local farmers’ cooperatives and the bank and to ask about the basic information of the cooperatives. Second, in-depth interviews were carried out. Interviews were conducted mainly with cooperative leaders and members to understand the development of cooperatives and whether they participate in digital credit, as well as to discuss the advantages of digital credit compared to traditional credit. Third, the literature and news reports on cooperatives were compiled to understand the annual operating and financial reports of cooperatives, and the participation of cooperatives in digital credit. Fourth, the official government website was used to learn about policies on cooperatives and digital credit by visiting websites such as CNKI, China Statistics Bureau, wind database, and Zhejiang Statistics Bureau.

3.4. Data Coding

The 6C family model is the most famous member of the “coding family” proposed by Glaser [35,36]. The 6C family model mainly constructs the relationship between core categories and categories from six aspects: context, motivation, conditions, consequence,
contingencies, and covariates [37,38]. The context refers to the background of the core category, the motivation refers to the reason for the core category, the condition refers to the precondition of the core category, the consequence refers to the influence or effect of the core category, the contingencies refer to the adjustment factor of the category and performance, and the covariates refer to correlations between different categories. In the digital credit behavior of farmers’ cooperatives, the motivation refers to the motivation of the cooperative to conduct digital credit, the context refers to the environment in which the cooperative conducts digital credit, the consequence refers to the result of the cooperative’s participation in digital credit, and the contingencies are the adjustment factor between the cause and the result, that is, the specific form taken by farmers’ cooperatives to carry out digital credit, covariates refer to the relationship between categories, that is, the matrix relationship between cause and contingencies, contingencies and consequence, and conditions refer to the prerequisites for farmers’ cooperatives to participate in digital credit. The “6C” family model of farmers’ cooperatives participating in digital credit is shown in Figure 3. In addition, in order to improve the reliability and validity of the research results, this paper uses the four testing standards proposed by [39], as shown in Table 1.

![Figure 3. “6C” family model of digital credit behavior of farmers’ cooperatives.](image)

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<tr>
<th>Testing</th>
<th>Case Study Strategy</th>
<th>The Stage Used by the Policy</th>
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<tr>
<td>Build validity</td>
<td>• Multiple sources of evidence were used  &lt;br&gt; • Form a chain of evidence  &lt;br&gt; • Check and verify the draft</td>
<td>• Data collection  &lt;br&gt; • Data collection  &lt;br&gt; • Write a report</td>
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<tr>
<td>Intrinsic validity</td>
<td>• Make pattern matching  &lt;br&gt; • Analyze competing explanations that are opposed  &lt;br&gt; • Use logical replication</td>
<td>• Analysis of evidence  &lt;br&gt; • Analysis of evidence  &lt;br&gt; • Analysis of evidence</td>
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<tr>
<td>Extrinsic validity</td>
<td>• Use theory to guide single case studies</td>
<td>• Study design</td>
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3.5. Saturation Test

In order to further verify whether information saturation has been reached in the process of data collection and analysis, and no new concepts, categories, or models will emerge. Based on the results described above, we also selected another four cooperatives and conducted coding analysis on 6 aspects of context, causes, contingencies, consequences, covariances, and conditions. The results show that the categories in the model are already developed very richly, that is, no more categories are developed. It can be seen that the above-mentioned behavioral model analysis coding on the context, causes, contingencies, consequences, covariances, and conditions of cooperatives participation in digital credit has reached theoretical saturation.

4. Results

4.1. Motivation for Digital Credit for Farmers’ Cooperatives

Farmers’ cooperatives generate a large amount of capital needs in their development. Compared with the membership capital and annual income, banks and other financial institutions have large credit lines that can meet the capital needs of cooperatives in a timely manner. However, there are many problems with traditional credit, such as high credit costs and credit methods that are incompatible with the production and operation cycles and seasonality of farmers’ cooperatives [40]. As the person in charge of QS Cooperative said; “We are raising livestock such as cattle and sheep mainly, because the growth cycle of cattle and sheep is slow and often takes many years before they can be slaughtered and sold, which leads to a long cycle of revenue funds for the cooperative. In traditional credit, banks do not accept live animals such as cattle and sheep as collateral, so it is very troublesome when applying for loans from banks, and often loan applications are not granted”. Farmer cooperatives have three motivations for digital credit: simple procedures, short loan times, and low loan rates.

Simple loan procedures. In the traditional credit model, banks and other financial institutions tend to seek high-quality customers with mature industries and stable income, and are not willing to provide credit to farmers’ cooperatives with weak capital strength and high operating risks. Farmers’ cooperatives do not obtain enough capital, which is not conducive to the transformation of small-scale agricultural production and operation subjects to large-scale, modern agriculture. Digital credit breaks through the constraints of traditional credit and greatly reduces the financing threshold and information asymmetry of farmers’ cooperatives through digital technology, which largely alleviates the problem of difficult credit for farmers’ cooperatives. At the same time, digital credit realizes the matching of supply and demand between financial institutions and cooperatives through network technology, largely eliminating the limitation of physical distance, increasing the source of funds for cooperatives, expanding the coverage of credit, and alleviating the credit problems of cooperatives. The XS Cooperative, a local producer of the famous Giant Peak grapes, is planning to expand its planting area in 2023 because of the rising demand for grapes, and has been busy buying seeds and hiring workers after the Spring Festival, but it has been difficult to realize the expansion because of the problem of insufficient funds. With the arrival of drones and digital credit from the Agricultural Bank of China’s Pujiang Sub-branch, XS Cooperative’s financial difficulties were solved. Through the digital survey by drone, the bank staff quickly grasped the real cultivation situation of XS Cooperative’s grapes and issued 300,000 RMB credit funds for XS Cooperative within 7 working days through the digital credit method of online loan and automated approval, which solved XS Cooperative’s capital problem.
Short loan time. The long application period of traditional credit seriously reduces the willingness of cooperatives to lend. The emergence of digital credit shortens the time for obtaining loans, promotes the availability of loans, and increases the enthusiasm of cooperatives for lending. The person in charge of the QS cooperative said that when applying for a loan from the bank, the bank staff inspected the beef cattle in the cooperative’s farm and nailed electronic ear tags into the ears of the cattle, so that the cattle could be used as collateral to apply to the bank for “intelligent animal husbandry loans”, turning live cattle into “cattle assets”. Relying on this credit product of the Agricultural Bank of China to pledge live cattle as collateral, QS Cooperative applied for a loan of CNY 2 million, relying on this loan to purchase a new batch of cattle seedlings, which brought considerable income. The digital credit can successfully “cash in” on live assets that were previously not available as collateral and obtain loans through online operations, eliminating the need to prove and collateralize the cooperative’s assets in traditional credit and shortening the loan time for the cooperative. According to the person in charge of the Agricultural Bank of China, since the second half of 2022, six “intelligent animal husbandry loans” have been issued, amounting to CNY 11.5 million. “Through the brand-new digital financing method, we have met the financing needs of some farmers and contributed digital financial power to enrich the local people’s table. At the same time, we have also promoted the development of farmers’ cooperatives, responded to national policies, and contributed our own strength”. As the head of the branch of the Agricultural Bank of China said, “At present, the loans are operated on the mobile banking Internet banking, pure data type of loans for customer assessment are background driven, mainly on personal information, credit transactions, credit card review, there will be no irregularities, the loan will usually arrive within 7 working days”.

Low interest rates on loans. Using big data and algorithms, digital credit can more accurately assess the credit risk of applicants and reduce the risk of bad debts. According to an interview with the head of the Agricultural Bank of China, “The Agricultural Bank of China introduced a number of drone equipment, and with the help of new digital wisdom such as drone measurement and online loans for farmers, it can solve the problems of high cost of manual survey and lack of precision of arable land measurement in agricultural financing”. Financial institutions collect data from previously scattered and non-standard cooperatives, process them to build credit profiles of farmers’ cooperatives, and calculate the risk efficiency of cooperatives based on cloud computing and artificial intelligence technology, which greatly reduces the cost of risk errors, “enhances” the credit of farmers’ cooperatives, and reconstructs the traditional credit concept of financial institutions towards cooperatives. Digital credit risk control is more precise, and financial institutions can offer lower interest rates. In terms of economic costs, cooperatives are a special kind of economic organization, characterized by small capital, small scale, and weak technology, and tend to pursue credit products with lower interest rates, and digital credit is catering to the requirements of rural cooperatives for credit.

4.2. Conditions of Digital Credit for Farmers’ Cooperatives

Farmers’ cooperatives can become high-quality customers of digital credit for financial institutions. On the one hand, farmer cooperatives have credit advantages, and on the other hand, they are supported by government policies.

First, there are credit advantages of farmers’ cooperatives. In digital credit, banks and other financial institutions use the Internet, big data and regional chains to break the shackles of traditional credit outlets, in which the credit of farmers’ cooperatives becomes an important reference for whether to provide them with credit [41]. The head of the branch of Pujiang County Agricultural and Commercial Bank said, “Farmers’ cooperatives are a special organization, and the degree of “reputation” or “reputation” they enjoy in rural areas is an important basic resource for participating in credit rating. “The president of XS Cooperative said, “Cooperatives should be creditworthy, and credit is the most important in the market. If consumers are satisfied with my grapes, my credit will be good.
and I will be famous, and it will be convenient to go to the bank for loans. “The participation of XS cooperatives in the “agricultural products fair”, “cooperative talent training”, “demonstration project construction”, “demonstration cooperative selection”, and other activities carried out by the government are all used as the basis for credit rating of cooperatives. At the same time, farmers’ cooperatives can bring together scattered farmers, thus reducing the cost of supervision and information collection for loans. The credit needs of ordinary farmers are small, and a small amount of credit can meet their needs for funds, but because ordinary farmers do not have high credit ratings, their credit applications increase the information collection costs of banks. The cooperative is a collective economic organization, and ordinary farmers pass the screening process when they join the cooperative, and lending to the bank through the cooperative can ease the cost of information search for the bank [42].

Both the head of QS Cooperative and the head of XS Cooperative made it clear that members are required to undergo a personal credit audit before joining the cooperative and submit a personal credit report from the People’s Bank of China as well as a crime-free certificate audited by the Public Security Bureau. This requirement excludes a large number of people with bad credit from the cooperative and greatly shrinks the cost of loan information for financial institutions. The key to receiving credit from financial institutions still depends on the credit score of the cooperative. Traditional credit mainly depends on factors such as the adequacy of the cooperative’s collateral and the availability of guarantors, etc. The development of digitalization can make living objects that were previously not available as collateral become collateral, which greatly increases the availability of loans to cooperatives [43].

Second, government policy support. Government support for farmers’ cooperative organizations is an inevitable requirement for the development of modern agriculture, and the government continues to strengthen the improvement of the rural credit system, which provides a good basis for improving the credibility of farmers’ cooperation [44]. The government plays an active role in the process of digital credit for cooperatives, and government departments have introduced a series of policy measures. The Central Document No. 1 of 2021 points out that the focus on family farms and farmers’ cooperatives two types of businesses, to encourage the development of multiple forms of moderate scale operations. In 2022, the Ministry of Agriculture and Rural Affairs issued the “Notice on the Implementation of New Agricultural Management Entity Improvement Actions”, encouraging localities to entrust professional institutions, industry organizations or professionals to provide financial management, training services, and technical guidance for farmers’ cooperatives through government procurement of services. The People’s Bank of China has arranged special refinancing every year since 2018, focusing on supporting financial institutions to use refinancing to support financial institutions in providing credit with preferential interest rates for agriculture-related fields. The government provides tax incentives to farmers’ cooperatives participating in digital credit. For example, the “Notice on Tax Policy Issues Concerning Supporting the Development of Rural Inclusive Finance” issued by the Ministry of Finance and the State Administration of Taxation in 2017 stipulates that the interest income obtained by financial institutions from granting small loans to farmers, small enterprises, micro-enterprises, and individual industrial and commercial households is exempt from value-added tax, while the loan contracts signed by financial institutions with farmers, small enterprises, and micro-enterprises are exempt from stamp duty. The People’s Bank of China and other five departments jointly issued the “Guidance on Financial Support to Comprehensively Promote Rural Revitalization and Accelerate the Building of a Strong Agricultural Country” in 2023, proposing that “relying on financial technology to empower rural revitalization demonstration projects, financial institutions are encouraged to use new-generation information technology to create financial products and services for the benefit of farmers and the people according to local conditions and improve the level of digital inclusive finance in rural areas”.
4.3. Contingencies Where Farmers’ Cooperatives Participate in Digital Credit

The forms of participation of farmers’ cooperatives in digital credit include short-cycle digital credit (such as “Huinong e-loan”) and long-cycle digital credit (such as “Funong Loan”).

The “Huinong e-Loan” is a convenient and efficient online loan product tailor-made by the Agricultural Bank of China for farmers. The app realizes online application, online withdrawal, and online repayment by a cell phone, enabling farmers to handle loan business without leaving home. The person in charge of the QS cooperative said that the “Huinong e-loan” can quickly borrow funds and solve the cooperative’s capital needs in a timely manner, which is a “good recipe” for farmers to get rich. Specifically, the production cycle of cattle and sheep raised by the QS cooperative is relatively long, and it takes time to raise the newly harvested young cattle. Members’ dividends cannot be paid out on a monthly basis, and sometimes it takes several months, which often causes difficulties in the operation of cooperatives. The emergence of the Huinong e-loan has greatly eased this operating pressure. According to the official website of Agricultural Bank of China, on the day the “Huinong e-Loan” was launched, the staff took the initiative to go to the countryside and dock with the townships, and QS Cooperative was one of the customers they docked with and they applied for a “Huinong e-Loan” of CNY 100,000 on the same day. After that, QS Cooperative applied for “Huinong e-Loan” of CNY 100,000 and CNY 50,000, respectively online, and they arrived on the same day. The head of XS Cooperative said that because of the expansion of the grape planting area, there is an urgent need to purchase a number of tools, and also need a sum of money to pay the land transfer fee and workers’ wages, and therefore, the cooperative’s demand for agricultural funds has become increasingly strong. After the loan investigation, Pujiang Branch sent a “financial bag” to the XS Cooperative for the first time, and invested CNY 300,000 in “Huinong e-credit” to relieve its difficulties. “The loan is quick, the interest rate is low, and most importantly, it can be operated on the cell phone and can be repaid as you go, which effectively solves the practical difficulties”. With the help of the “Huinong e-Loan” from the Pujiang Branch, XS Cooperative has multiplied its confidence in development, “With this money, grape planting will not be delayed and the income this year is guaranteed to be more than 300,000”.

The “Funong Loan” is jointly launched by the National Rural Revitalization Bureau and the head office of Agricultural Bank of China to meet the needs of the poor population in developing industries, featuring a large amount and a long term, up to five years, which is suitable for developing industries with a long cycle. The loan interest rate is low, the one-year benchmark interest rate LPR (Loan Quoted Rate) is 3.65%. LQ Cooperative mainly breeds chickens and ducks, but the price of feed has increased due to the epidemic, and the sales are restricted, so the operation is difficult compared with previous years, and the capital turnover is in trouble. After learning about the financing needs of the cooperative, the cooperative immediately arranged for the account manager to conduct a field assessment and issued a loan of CNY 80,000 for the cooperative within 7 days. The farm was put back into normal operation. After a joint field investigation by the Pujiang County Agricultural and Commercial Bank, a CNY 200,000 “Funong Loan” was successfully granted to QH Cooperative to support its grain cultivation and processing. “We are now worried about the lack of funds for crop planting and fertilization growth, and this Funong Loan’ launched by our agricultural bank is really a loan product tailored for our agricultural operators, which provides a strong guarantee for us to increase production and harvest in the coming year”, the person in charge of QH Cooperative said.
4.4. Performance of Farmer Cooperatives Participating in Digital Credit

4.4.1. Economic Performance

1. Increase the income of cooperative members

By participating in digital credit, farmers’ cooperatives can increase the income of cooperative members. The QS cooperative obtained more than 2 million loans through digital credit, and brought more benefits to the cooperative after purchasing new cattle and seedlings. The president of the QS cooperative said, “Since the live cattle in the cooperative can be mortgaged, the bank has given loans in a timely manner, the operating income of the cooperative has also increased, and more dividends have been distributed to members”. Driven by digital credit, the scale of agricultural operations of farmers’ cooperatives has continued to expand, and their operating income has also increased [45]. The four cooperative cases show that the average income of farmers who join cooperatives is about 15% higher than that of non-members of cooperatives, and after joining cooperatives, farmers’ agricultural operating income will increase with the expansion of cooperatives.

2. Improve the availability of loans for farmers

Farmer cooperatives can alleviate financing difficulties through digital credit. With the development and popularity of the Internet, the problems of information asymmetry and high transaction costs in agricultural finance have been effectively alleviated, and traditional financial institutions are able to provide more accurate and convenient services through digital technology, effectively remedying the problem of information asymmetry. Participation in digital credit by farmers’ cooperatives can improve their ability to resist risks. Since agriculture is highly cyclical and faces both natural and market risks, farmer cooperatives will have operational risks at different stages of the agricultural growth cycle, and digital credit can provide some guarantees to reduce such operational risks. For example, assets such as the live cattle of the QS cooperative, the grapes of the XS cooperative, the moso bamboo of the QH cooperative, and the chickens of the LQ cooperative are difficult to evaluate in traditional credit and cannot be used as the basis for bank loans. Now, they are monitored by digital technology, which increases the risk-taking ability of cooperatives and, to some extent, their loan accessibility [46].

4.4.2. Social Performance

1. Promote the credit building of farmers’ cooperatives

On the digital credit platform, more information about the members of farmers’ cooperatives can be obtained to build a more robust credit assessment system, which allows for a more accurate credit assessment of farmers. Agricultural banks give full play to the leading role in the construction of rural credit system, docking to the Pujang Agricultural and Rural Bureau and other agriculture-related departments to achieve cross-sectoral data sharing and interaction through the data interface call method to achieve the integration of agricultural credit information data of each platform, to solve the two major problems of data ownership barriers and information security barriers [47]. Relying on the credit information sharing platform for financial services, the government has established a model laboratory to provide a dedicated modeling database and modeling environment for agricultural financial institutions, so that financial institutions can import offline data into model cross-validation information to complete a more complete credit for farmers portraits, providing precise financial services [48]. “Banks will only lend to those with good credit, and digital credit will encourage cooperatives to strengthen their credit building”, said the head of QH Cooperative.

2. Promote sustainable agricultural development

The digital credit platform can help the poor to obtain more loan funds, which can better improve the living standards of the poor and thus increase the ability of the rural poor to escape poverty [49]. The heads of both QS Cooperative and XS Cooperative said that digital credit is easier to obtain loans than traditional credit, and having enough
money will bring more income to the cooperative and more dividends to the members, so they will not have to live in poverty anymore. By participating in digital credit, cooperatives can provide members with more convenient payment methods, allowing them to access more funds for agricultural production, thereby increasing their agricultural productivity and income levels, which greatly contributes to sustainable agricultural development [50,51].

4.5. Relevance of Farmer Cooperatives’ Participation in Digital Credit

Glaser and Strauss [52] argue that one type of change leads to another, so what is the relationship between the motivation, form, and performance of digital lending in cooperatives?

The different motives of farmers’ cooperatives to participate in digital credit will lead to different forms of digital credit participation, as shown in Table 2. When the motivation is a simple loan procedure, farmers’ cooperatives can choose the “Huinong e-Loan” or “FuNong Loan”, both of which can be applied for online through cell phones, making the procedures convenient and fast. When motivated by the short loan time, the farmers’ cooperative society gives priority to the “Huinong e-Loan”, which is usually available within one working day through the bank’s automatic review and round-the-clock service, while the “Funong Loan” requires the review of many conditions and creditworthiness of the cooperative and cannot pass the loan quickly. When motivated by the low interest rate, the farmers’ cooperative society gives preference to the “Funong Loan”, which has the lowest interest rate in the market with the benchmark interest rate, while the interest rate of the “Huinong e-Loan” is 4.25% and above. Based on the assumption of a rational person, no matter what the motivation is, farmers’ cooperatives pursue cost minimization based on the relative advantages. The transaction costs, time costs, and opportunity costs behind the motivations of convenient procedures, short loan acquisition time, and low loan interest rates are important reference factors for farmers’ cooperatives to choose digital credit participation forms. Therefore, under different motivations, farmers’ cooperatives choices will vary.

<table>
<thead>
<tr>
<th>Motivation of farmers’ cooperatives to participate in digital credit</th>
<th>Forms of Participation of Farmers’ Cooperatives in Digital Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenient loan procedures</td>
<td>Huinong e-Loan: ✓</td>
</tr>
<tr>
<td>Short loan acquisition time</td>
<td>FuNong Loan: ✓</td>
</tr>
<tr>
<td>Low interest rates on loans</td>
<td></td>
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</tbody>
</table>

Note 1: We asked 2 professors and 3 doctors to conduct a comprehensive evaluation, and followed the steps of “scoring separately—comparing differences—negotiating and unifying” to determine the final result [53]. Note 2: ✓ refers to the form of digital credit chosen by farmer cooperatives under different motivations.

Different forms of digital credit for farmers’ cooperatives produce different performance, as shown in Table 3. The “Funong Loan” requires the review of many conditions and creditworthiness of cooperatives, which has contributed to the credit building of cooperatives. The “Huinong e-Loan” is a platform for automatic credit granting, which grants loans to standard cooperatives, but not to those that are not standardized, which does not play a big role in building the credit of farmers’ cooperatives. The “Funong Loan” was established for the need of developing industries for the poor people, while the “Huinong e-Loan” fills the capital shortage for farmers’ cooperatives with good production and operation, so the “Funong Loan” can speed up the process of poverty alleviation in rural areas, and the “Huinong e-Loan” can promote the sustainable development of agriculture. Regardless of the form of digital credit, it will bring economic performance to cooperatives, alleviate their financing difficulties, increase the availability of loans to
cooperatives, and thus increase the income of cooperative members. In addition, compared with the “Huinong e-Loan”, the “Funong Loan” will bring the performance related to credit building, poverty alleviation, and sustainable agricultural development. Therefore, from the macro perspective of the overall layout of China’s agricultural modernization, different forms of farmers’ cooperatives participating in digital credit have different and far-reaching impacts on the long-term development of China’s agriculture.

Table 3. Correlation between form and performance of farmers’ cooperative participation in digital credit.

<table>
<thead>
<tr>
<th>Participation Form</th>
<th>Huinong e-Loan</th>
<th>Funong Loan</th>
</tr>
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<tbody>
<tr>
<td>Increase Revenue</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Loan Accessibility</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Credit Building</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Poverty Alleviation</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sustainable Agricultural Development</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: We asked 2 professors and 3 doctors to conduct a comprehensive evaluation, and followed the steps of “scoring separately—comparing differences—negotiating and unifying” to determine the final result [53]. Note 2: ✓ refers to the performance of farmers’ cooperatives under the choice of different credit forms.

5. Conclusions and Policy Implications

Digital credit, with its simplified and intelligent approval methods, innovative credit assessment methods and personalized services, realizes the sinking of service targets and plays a role in boosting the development of the agricultural industry, promoting farmers’ consumption upgrading and improving the level of rural public services. At the same time, digital credit can effectively solve the “digital divide”, “ecological divide”, and “educational divide” between urban and rural areas and avoid problems such as regional differentiation of financial development, insufficient service depth, digital financial exclusion, and increased potential financial risks.

5.1. Conclusions

The development of farmers’ cooperatives plays an important role in realizing the modernization of agriculture and rural areas. With the development of digital financial services, the demand for digital credit for farmers’ cooperatives is growing. On the one hand, digital credit for farmers’ cooperatives can improve the coverage of financial services, improve the quality of financial services, increase farmers’ income and promote the sustainable development of farmers’ cooperatives; on the other hand, digital credit for farmers’ cooperatives helps cooperatives improve their creditworthiness, reduce financing costs and improve the efficiency of capital use, so that they can better cooperate with banks and other financial institutions and increase the scale of credit funds. This study uses the “6C” family model and the grounded theory to provide insight into the digital credit behavior of farmers’ cooperatives. The main conclusions are as follows: the motivation for the digital credit of farmers’ cooperatives is that the credit procedures are simple, the loan period is short, and the loan interest rate is low, the condition is that the farmers’ cooperative receives a reputational advantage and government policy support, the main form is the participation of cooperatives in short- and long-cycle digital credit, and the consequence is reflected in increasing the income of cooperative members, improving the availability of cooperative loans, promoting cooperative credit building, and achieving sustainable agricultural development. Different participation motives affect digital credit forms differently, and different forms of credit produce different performances.

5.2. Policy Implications

First, improve relevant policies and regulations to reduce credit risks. Government departments at all levels should incorporate the establishment of a sound rural credit guarantee system into their work priorities, and make it an important political task at present.
Financial institutions play their own advantages, actively carry out credit business, establish and improve credit management system and risk prevention mechanism. Financial institutions strengthen communication with farmers and enhance farmers’ market awareness and risk prevention awareness by organizing them to learn practical techniques of agricultural planting and breeding. The government should strengthen the construction of the legal system of rural finance, improve the system of laws and regulations, play the role of judicial protection, administrative supervision and public opinion supervision, and fundamentally solve the problem of the lack of legal system in the development of farmers’ cooperatives.

Second, improve the service level of financial institutions. The government should actively explore the development of various forms of cooperative financial models, and improve the operation of cooperatives through standardized management, prudent operation and risk prevention and control measures to promote the reform of rural credit cooperatives and guide rural credit cooperatives to play the main role in supporting agriculture. On the one hand, it is necessary to vigorously improve the service function, service efficiency and service level of rural credit cooperatives; on the other hand, it is necessary to strengthen business cooperation and information sharing among rural credit cooperatives, thus forming a group of powerful rural credit cooperatives. In accordance with the principle of “market-oriented and customer-centered”, innovate credit products and service methods, improve the construction of credit rating system, and actively develop small loan guarantee business, etc.

Third, innovate financial products and services to meet the credit needs of cooperatives, develop and improve the agricultural insurance system, and promote the combination of agricultural insurance and credit. There is a need to actively expand the scope of policy-based insurance, give full play to the credit-enhancing role of agricultural insurance, reduce the financing risks of farmers, and enhance the confidence of credit institutions in granting loans. They must make full use of the management methods of cooperative mutual aid funds, give full play to the role of farmers’ cooperative organizations, and provide financial services for farmers’ cooperatives. The should continue to strengthen and improve the innovation of rural financial products and services to meet the needs of different types of rural households for loan products, terms, lines, and interest rates. For cooperatives with good credit and strong guarantee capabilities, the repayment period or repayment shall be extended or postponed by means of renewing loans without repayment of the principal, and repayment at any time. There is a need to provide short-term low-interest loan support to cooperatives that meet the conditions and have the willingness to produce and operate.

Fourth, establish a sound credit system and provide credit guarantees for cooperatives and farmers. Since cooperatives are generally small in scale, it is difficult for banks to investigate loans to cooperatives and farmers, which requires the government to organize relevant departments and provide credit guarantees for cooperatives. The government can implement policy guarantees for cooperatives, guide and support professional guarantee companies to enter into agricultural development, reduce financing costs for cooperatives, and broaden financing channels for farmers’ cooperatives. In addition, the government can set up an agricultural credit guarantee fund to transform credit funds from banks into credit support for farmers’ cooperatives through risk compensation and loan interest subsidies. The government should play its leading role in establishing a farmer information management system and credit evaluation mechanism to provide credit guarantees for farmers’ cooperatives.

5.3. Limitations

This study has the following deficiencies: First, this study only discusses the digital credit behavior of farmers’ cooperatives, but does not discuss the factors that affect their behavior in depth. In the future, we can discuss the digital credit behavior of farmers’ cooperatives from the aspects of government, cooperatives, finance, factors influencing credit behavior, and the degree of influence of different factors. Second, this paper selects
four cases for analysis, the applicability of the conclusions obtained needs to be further confirmed, and a large sample study can be carried out from eastern, central, and western China in the future to draw more generalized conclusions.

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