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Social Capital in Cooperative Memberships and Farmers' Access to Bank Credit–Evidence from Fujian, China

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Abstract: For rural communities in poor countries to develop, farmers need money to invest in their farms. However, with limited assets of their own and poor conditions for obtaining loans, the farmers' operations suffer. This study explores how farmers' chances of obtaining a bank loan are related to the social capital that they receive from their cooperative membership. The data originated from 743 farmers in Fujian province, China, and was analyzed with the help of the instrumental variable probit (IV-probit) regression model. The results show that (a) cooperative members have a higher chance of obtaining a bank loan compared to non-members; (b) cooperative membership positively influences the chances of obtaining a bank loan for farmers with no acquaintances in banks and government or off-farm work; and (c) among farmers with higher financial knowledge, cooperative members are more likely to receive a bank loan than non-members are. Therefore, the conclusion provides empirical evidence for the financial function of cooperatives to farmers. The findings are especially relevant for cooperatives in developing countries, and they call for farmers and cooperatives to establish cooperative financial institutions. Moreover, the research conclusions point out the direction for further improving the financial effect of cooperatives.

Keywords: farmer cooperative; agricultural credit; peasant household; bank loan; information asymmetry; social capital

1. Introduction

1.1. Background

Small agricultural producers in developing countries often have little capital to invest in their farms [1,2]. With limited assets of their own and poor conditions for obtaining loans, the farmers' operations suffer. In China, for example, more than half of the farmers have difficulty obtaining credit; hence, improving credit availability for farmers is important for alleviating poverty in rural areas [3]. In recent years, the introduction of national policies in China has improved the financial system. Most Chinese banks and other financial institutions (henceforth "banks") are, however, still reluctant to lend to farmers because most have unstable incomes, insufficient collateral, a high default rate, and poor knowledge of financial issues [4,5]. Moreover, cooperative banks and mutuals are not widespread in China, although there are numerous cooperatives in other industries within the country's agricultural sector.

Agricultural cooperatives (henceforth "farmer cooperatives" or "cooperatives") help Chinese farmers on upstream and downstream markets and provide technical training and production guidance. Economists present many arguments for why cooperatives are positive for farmers in economic terms [6,7]. The most widespread argument is provided by transaction cost economics, which maintains that cooperative members face a lower risk of being deceived compared to farmers who deal with independent business partners [8]. Apart from the economic benefits, cooperatives also have an important social role. The social relations between members of a cooperative society imply that farmers gain a variety

of social and socio-psychological benefits, such as a sense of community, safe marketing channels, fair pricing, and opportunities to exercise influence [9].

When explaining why cooperatives provide economic, social, and socio-psychological benefits to their members, social capital theory offers a valuable toolbox. At the core of the social capital theory is trust, for example, members' trust in each other and in the leadership [10]. Thus, cooperatives are established not only because a group of individuals perceives a shared problem but also because the individuals have sufficient trust in one another. Trust is a condition for farmers' willingness to conduct trade with the cooperative, to invest in it, and govern it. Social capital can even be claimed to create all other types of capital in cooperative business firms [10,11]. Likewise, when an established cooperative is to support the members, the leadership must try to uphold a sense of trust within the membership [10].

The importance of social capital in cooperatives is seen in the benefits that cooperatives offer to their members, including when members need bank credit. The present study is devoted to the connection between farmers' access to bank loans and the social capital that exists in the membership as well as in other social relationships. In addition to obtaining a certain amount of social capital through participation in cooperatives, farmers will obtain or accumulate primitive social capital through other channels. When they are at different levels of primitive social capital, the importance of cooperatives for them could be different. Therefore, the aim of the study is thus to not only to explore the relationship between the social capital that farmers enjoy through their membership and their access to bank loans but also to analyze whether the role of cooperative membership in farmers' access to bank loans is heterogeneous under different levels of original or primitive social capital. The study is based on a unique dataset, comprising questionnaire answers from a sample of 743 farmers that is representative of the farming population in Fujian province, China.

1.2. Literature on Cooperatives' Importance for Members' Access to Credits

Numerous empirical studies in various agricultural industries support the theoretical claim that cooperatives benefit farmers in economic, social, and socio-psychological respects, not least in developing countries [12–14]. For example, researchers have shown that cooperative members gain a better livelihood, improve their modes of production, receive help with the acquisition of pesticides and fertilizers, etc. Tran et al. [15] report that Vietnamese vegetable growers who are cooperative members receive a higher income than non-members do, and Abate et al. [16] show that Ethiopian smallholders improve their technical efficiency thanks to support services from their cooperatives. In a study of Indian dairy farmers, Kumar et al. conclude that membership in a cooperative has a positive impact on milk yield, profits, and food safety [17]. Further examples are Verhofstadt and Maertens, who analyzed the impact of cooperative membership on the agricultural performance of rural households in Rwanda [18], and Manda et al., who found that cooperatives stimulate the adoption of new agricultural technologies among Zambian farmers [19].

Notwithstanding the studies above, research that specifically addresses the importance that cooperative memberships have for farmers' credit is rather meager [20]. In a study of Chinese farmers, Peng et al. found that cooperatives raise the members' chances of obtaining credit because members have low transaction costs in their relations to financial institutes [5]. Likewise, a study of Nigerian cocoa cooperatives reports a positive relationship between cooperative membership and access to credit. "Farmers who have simultaneous access to credit and cooperative services achieve significantly higher productivity than farmers who have access to either credit or cooperative services or those that do not have access to these services at all" [21] (p. 1). While these studies show that there are correlations between cooperative membership and farmers' access to credit, they fail to provide theoretical explanations for why cooperatives positively influence members' access to credit.

Thus, the primary objective of this study was to provide a more rigorous assessment of the impact of social capital provided by agricultural cooperatives membership on farmers'

credit access. This study contributes to the research on agricultural cooperative and social capital theory. Firstly, the present study is the first one to shed theoretical light on a specific type of benefit that cooperatives can provide to their members, namely the members' chance to obtain bank credit. It provides coherent explanations of how social capital is provided by cooperative membership on farmers' credit access. In this way, the study contributes to the strand of research that examines the conditions under which cooperatives may be of value to their members [8,11]. This topic is relevant, especially for cooperatives in developing countries, and the observations about how cooperatives may bring value to the members may be transferable to other agricultural industries. Second, we analyzed whether there is heterogeneity concerning the impact of cooperative membership on farmers' credit access under different levels of original or primitive social capital based on first-hand data. Thirdly, we used the IV-probit model to control the endogeneity caused by the bidirectional causality between cooperative membership and farmers' credit access.

The next section presents a theoretical framework focusing on the importance of social capital in a cooperative context. On this basis, hypotheses are stated. Section 3 reports on the methodological issues in connection with the empirical study, namely the identification of variables, the data collection procedure, and the choice of statistical approach. Section 4 presents the results, and Section 5 discusses these findings. Finally, Section 6 presents conclusions.

2. Theoretical Framework

2.1. Social Capital Theory

The economic benefits that cooperatives provide to their members are conditional on the social relations that exist between members and leadership and the cooperative and other organizations. Deng et al. [22] (p. 317) state, "social capital can be regarded as a key success factor of cooperatives." Hence, farmers' chances of obtaining a loan may be affected by the eventual support they receive from each other, the cooperative leadership, and actors outside the cooperative [23,24]. Social capital involves "trust and norms of reciprocity inherent in one's social networks" [25] (p. 153). An individual who enjoys social capital from a friend may have access to the friend's resources, although only at the discretion of the friend, which is to say that trust typically involves mutuality.

Social capital theory is used in many studies of cooperative organizations. Thus, it has been claimed that social capital within the membership is needed for cooperatives to be governed in the interests of the members [26,27]. Researchers have examined members' involvement, trust, satisfaction, loyalty, beliefs, norms, and similar concepts [9,10,28–30]. The concepts express how members are more or less affiliated with their cooperatives. In strong connections, there is bonding social capital [23]. This means that people consider themselves to have a similar social identity. It is often based on emotions such as those between family members, relatives, friends, long-term business partners, and members of ideologically strong groups. Respect and reciprocity characterize these relationships.

When individuals with different experiences, values, and backgrounds interact, *bridging social capital* may exist, for example, at farmers' meetings, and on social media. Even if farmers are not well acquainted, they can exchange ideas about issues associated with values or their agricultural practices. Meetings among cooperative members strengthen cohesion and create a sense of community. Such networking affects members' willingness to participate in cooperatives. Some researchers identify a third category, *linking social capital* [31], which pertains to connections within hierarchically structured networks, such as members' relations to the cooperative leadership, while both bonding and bridging social capital exist in horizontal relations.

2.2. Members' Social Relationships within Cooperatives

2.2.1. The Members' Relationships with Each Other

Thanks to bonding and bridging social capital, members may receive advice and support from fellow members when they are about to apply for bank loans. Social capital

also may cause less defection, which is important for banks. If one farmer has difficulties paying installments and interests, this individual may face social pressure and then pay the debt [5]. Hence, individuals care about their reputation within the membership. If a member defaults, this might affect other members, whereby the entire membership may acquire a bad reputation among the banks [32].

Social capital is less likely in the relations between individual farmers and bank officials, but there may be indirect relations insofar as the cooperative leadership may have connections in a bank. Such relations can be important as the cooperative's reputation may be transferred to the farmers, and likewise, how a member manages a loan may affect the cooperative's image. Thus, cooperatives will want their members to repay their loans, and members will want to repay because they want to be accepted among other members. In contrast, if a non-member farmer defaults on a loan, this will have a limited impact on other farmers.

2.2.2. The Members' Relationship to the Cooperative Leadership

The most effective help that a cooperative leadership can provide to those members who want to borrow money is to assist them in obtaining a good economy. If a cooperative succeeds in reducing the members' business risk and raising their incomes, for example, by providing technical guidance, the banks will be more prone to issue loans [17]. The cooperative leadership may encourage members to assist each other financially, for example, by advising members to give financial support to a fellow farmer.

2.2.3. The Members' Relationship to Banks

The farmers and the bank officers widely differ in many respects. There are, for instance, cultural, geographical, economic, and social distances. The bank officers are white-collar employees who work and live in towns, have a stable economy, and are better educated, while farmers are scattered in rural areas. For the banks, loans to farmers are problematic because farmers often need small loans for short periods (microcredits), which means that banks will have high administrative costs compared to loans lent to industrial enterprises. Moreover, the banks do not always understand why farmers need capital for their living expenses between harvests. Industrial firms tend to use the capital for investments, but it does not pay banks to surveil farmers' use of the money.

Cooperatives can facilitate the relations between farmers and banks [10]. In China, most financial institutions lack interest in agricultural finance, and it is difficult for farmers to obtain credit. The reason is the farmers' unstable income, lack of collateral, and high transaction costs caused by information asymmetry. When farmers apply for loans, high transaction costs may appear because a bank needs information about the farmer's financial status, and the farmer is not able to provide such information. Thus, both parties experience transaction costs, which are often greater than the benefits they may obtain, and so, there is a problem of adverse selection.

However, if farmers are cooperative members, these difficulties will be solved to some extent. Most cooperative members are from the same village and are familiar with each other, and the resulting social capital may mean that they are willing to support each other. The banks can learn about farmers through the cooperatives, which reduces the banks' need for surveillance. The risk of failing members is thus reduced. Furthermore, the social capital in the cooperative leadership's relations with the banks will reduce the information asymmetry and thereby, the transaction costs for both the farmers and the banks [5]. Moreover, some cooperatives even provide guarantees for farmers to solve the problem of insufficient mortgage assets of farmers. Finally, farmers' participation in cooperatives is conducive to improving their income level, thus increasing the farmers' repayment ability. To sum up, this improves the borrowing ability of cooperative members' farmers [10].

The above discussion lends itself to the following hypothesis:

Hypothesis 1. *Cooperative members have a higher chance of obtaining a bank loan compared to farmers with no membership.*

2.3. Heterogeneous Impact of Cooperative Membership on Farmers' Credit

For farmers with different capital endowments, the role of cooperatives in helping them may vary greatly. What we are concerned about is which type of farmers are more significantly helped by cooperatives in terms of credit financing. In addition to obtaining social capital from cooperatives, farmers also have other social capital through other channels, such as the social relations of relatives and friends. In order to distinguish these two channels of obtaining social capital, the paper defines social capital obtained from other channels as primitive social capital. Drawing on the practice of relevant literature [10], this paper divides the primitive social capital of farmers into relational social capital, which is represented by whether there are relatives or friends in the bank or government departments, external social capital that is whether they have off-farm work experience here and cognitive social capital indicated by financial knowledge.

2.3.1. Farmers' Social Relations within Banks and Government

In addition to social capital through participation in cooperatives, farmers will obtain social capital through other channels [30]. The social capital that farmers have within their cooperatives may be supplemented with other types of social relations. One category is relations to friends and relatives who work in banks and the government. It is, however, not evident whether such relationships are positively or negatively related to the availability of credits. Different mechanisms may be in operation.

On the one hand, both members and non-members may enjoy bonding social capital in their relations to relatives and friends who work in banks or the government. This social capital can be seen from a *guanxi* perspective, i.e., the Chinese cultural trait of granting favors to others in your social network [10]. Thus, there may be a highly positive correlation between both members' and non-members' chances of obtaining a bank loan and their closeness to friends and relatives in power positions.

On the other hand, while non-members are not related to cooperatives, the social capital members receive from fellow members and the cooperatives' leadership may affect their credit possibilities. Moreover, cooperative leaders may enjoy social capital *(guanxi)* in their relationship with governments and banks [10], and the members' chances of obtaining a bank loan thereby increase even if they do not have personal relationships with banks or the government. Thus, banks are more likely to grant loans to cooperative members compared to non-members. A member's chance of obtaining a bank loan depends on the combined effect of the social capital within the cooperative and the cooperative's social capital in relation to banks and the government. Thus, for the members, credit does not mainly depend on whether they have friends and relatives in power positions.

Non-members, in contrast, may be expected to rely on their friends and relatives to obtain a bank loan. It is likely that non-member farmers are more dependent on their personal contacts when applying for bank loans. Even if members have no such personal relationships, it can be easier for them to obtain a bank loan thanks to the social capital that they enjoy with the cooperative.

The discussion above leads to another hypothesis:

Hypothesis 2A. *Cooperative members have a higher chance of obtaining a bank loan even when they have no friends or relatives in banks and the government, as opposed to non-member farmers.*

2.3.2. Farmers' Social Relations through Off-Farm Work Experience

The social relations that farmers have with each other are probably characterized by bonding social capital because, most often, the farmers have lived all their life in the same village with the same neighbors, whereas bridging social capital is more likely in the relationships that farmers have with people whom the farmers have met as migrant

workers. These people may be other migrant workers, supervisors, or others, whereby the farmers learned about life outside their village. It is likely that the farmers' external networks affect their way of thinking, for example, about credits and related issues. Peng et al. found that farmers' experience in off-farm work could reduce credit constraints [5].

However, for farmers who have no experience in off-farm work, external social capital is lower. If these farmers participate in cooperatives, they will rely more on the resources of the cooperative [16,24,33,34]. These farmers are likely to be full-time farmers. They gain their living from agriculture—whether cooperative members or not–and will consider their farm income to be more important than farmers with incomes from other sources. Therefore, farmers without experience in off-farm work who are also cooperative members will have a better chance of obtaining a bank loan thanks to the social capital within the membership.

This reasoning results in a third hypothesis:

Hypothesis 2B. *For farmers with no off-farm work experience, cooperative membership positively influences their chances of obtaining a bank loan.*

2.3.3. Farmers' Financial Knowledge

Noctor et al. [35] proposed the concept of financial knowledge. They suggested that the level of financial knowledge is the ability to make wise judgments and effective decisions in the use and management of funds. Farmers' financial knowledge will thus raise their availability of credit [36]. Financial knowledge affects individuals' preference for borrowing channels, and it influences the ability to make financial decisions, including the matters of repayment guarantees. Thus, farmers with good financial knowledge are more likely to be successful in their credit applications, and they will repay debts and interest on time.

Because farmers are different in terms of financial knowledge, there are differences in the ability to use social capital to solve credit constraints. This implies that for farmers with high financial knowledge, a cooperative membership may increase their social resources and improve their ability to obtain credit. Cooperatives are more important for farmers with higher financial knowledge when obtaining credit, as farmers' participation in cooperatives can help them to strengthen other social relations [36]. Because of the social capital within a cooperative membership, the well-informed members will appreciate being esteemed among the other members and, therefore, they will do their best to be successful in their credit applications [5]. This discussion results in one more hypothesis:

Hypothesis 2C. *For farmers who have better financial knowledge, membership positively increases the chance of obtaining a bank loan.*

3. Methodology
3.1. Statistical Approach
3.1.1. Benchmark Model

When asking a sample of farmers about whether they had received a bank loan, we use affirmative answers as a dummy variable that represents the dependent variable. Since the dependent variable was discrete, both the Logit model and Probit model could be used to estimate Equation (1). Unlike discriminant analysis, logit regression maintains less restrictive assumptions. It has been widely used in studies on cooperatives [10,30]. A logistic regression model is specifically designed to analyze the relationship between a binary dependent variable and a set of explanatory variables. We decided on the following Logit model for the estimation:

$$logit(p_i) = \alpha_i + \beta_i CM_i + \delta_i SC_i + \gamma_i X_i + \varepsilon_i \tag{1}$$

where p_i is the likelihood of farmers obtaining a bank loan. In particular, CM_i is an observed dummy variable, and it takes the value of 1 if the farmer belonged to a cooperative. SC_i represents farmers' social-capital variables, X_i represents control variables (households and

farm-level characteristics such as age, education, household size, income source, annual income) and α_i is a constant term.

3.1.2. An Instrumental-Variable-Based Probit Model (IV-Probit Model)

The estimated results of the effect of cooperative membership on farmers' loans may be biased due to endogeneity problems. Thus, if all explanatory variables are exogenous, it is easy to obtain consistent estimates of the above parameters to be estimated by Equation (1). However, there are some endogenous relationships between farmers' memberships of cooperatives and access to credit, which are not considered in the above model. That is, there is a risk for reverse causalities. Farmers who obtain loans are more likely to avoid risks by belonging to cooperatives because they need to bear greater operational risks in their farming operations. If we do not deal with the endogenous nature of variables, it is likely to lead to some errors in estimated results. Therefore, in order to mitigate the endogenous impact of reverse causality, we use the Instrumental Variable Probit model (IV-probit) [37]. The equations were as follows:

$$CM = \partial + \beta X + \gamma V + \varepsilon \tag{2}$$

$$LOA = \alpha + \delta CM + \beta_1 X + \epsilon \tag{3}$$

where *CM* represents whether the farmers belong to a cooperative, and *LOA* is the dependent variable, which represents whether farmers have obtained bank loans. *X* is a group of control variables, β, γ, δ, and β_1 represent the estimated parameters, and ε and ϵ are error terms. Moreover, *V* is an instrumental variable, which is expected to relate to whether farmers belong to cooperatives, but not whether farmers obtain bank loans. The model can be divided into two stages. In the first stage expressed in Equation (2), the instrumental variable method is used to obtain the induction equation of farmers' participation in cooperatives and instrumental variables, and the fitting value of farmers' participation in cooperatives is obtained. The second stage, represented by Equation (3), is to replace the original value with the fitting value of farmers' participation in cooperatives and conduct a probit regression.

When a tool variable is to be found for IV analysis, two conditions must be met. Tool variables must only affect explanatory variables and have no direct impact on the interpreted variables. According to the theory of peer effects [38,39], the variable "Share of villagers participating in cooperatives (RPC)" (in Table 1) is treated as an *instrumental variable.* Specifically, farmers are more likely to participate in cooperatives if their neighbors do so, but the percentage of farmers in the same village participating in cooperatives will not affect whether farmers can obtain bank credit. Furthermore, Chi-square test statistics (Waldχ^2) were used to determine whether the core independent variable is endogenous. According to the test ($p < 0.001$), the "share of villagers participating in cooperatives" is an endogenous variable.

3.2. Data Collection

This study investigates farmers in Fujian province, which is located on the coast of the East China Sea and is one of China's more developed provinces. Plains and hills dominate in the east, while the west is mountainous. Most of the population, and the most important economic zones, are in the eastern coastal area. The province has a population of about 38 million. Like elsewhere in China, cooperatives play an important role in the province's agriculture. The farmers in the Fujian Province are generally smallholders with an average acreage of 0.015 hectares or 150 m^2 [40].

The data were collected in collaboration with a survey conducted by the governmental research program *Rural Permanent Observation Survey* from 2018 to the end of 2019. This program has run every year since 1986 throughout China's countryside. Samples are randomly selected and followed up every year. The survey covered more than 300 villages and more than 20,000 farmers in 31 provinces in China. Its purpose is to provide guidance

for policy decisions about agricultural and rural development to be made by governments at all levels as well as governmental departments.

The governmental project team identified 43 villages in nine prefecture-level cities in Fujian Province. The villages were chosen to be representative of the province's agriculture in terms of economic progress, the farming population's attributes, and the stage of agricultural development. Because of the quest for representativeness, the respondents have various attributes and are both cooperative members and non-members. Some villages are located in the plains, while others are found in hilly areas and still others in the mountains. There are 13 villages with good economic conditions, 21 with moderate conditions, and 9 with poor economic situations. The overall population distribution of Fujian province is higher in the East, where 30 villages were selected, and lower in the West, where 13 villages were selected.

The governmental survey integrates routine surveys, special surveys, and so-called dynamic monitoring and analyses. The present study was organized in the form of a special survey, which focuses on a certain subject, such as cooperative development. That is, the data are very compressive and of the highest quality. Thus, this study comprises the same 43 villages the governmental survey identified, which provides assurance that the population, from which the study's sample comprising 900 farmers was randomly selected, is representative of the farmers in the Fujian Province in terms of the variables educational level, income level, income source, and social relations.

The respondents were both cooperative members and non-members, answering close-ended questions in a questionnaire. Contacts with the respondents took place via the local agricultural administration, and Face-to-face interviews were conducted with the household heads at the farmers' places.

The questionnaire contains, firstly, questions that the research team stated on the basis of the variables, which appear in the hypotheses, and secondly, questions that were included in the governmental survey. However, not all respondents answered all the questions. After questionnaires with incomplete information were removed, there were 743 usable questionnaires, corresponding to a response rate of 82.6%. Among them, 314 respondents had experience with loans, accounting for 42.3% of the sample, while 237 respondents belonged to a cooperative, accounting for 31.2% of the sample. A total of 592 respondents came from coastal areas, accounting for approximately 80% of the sample, which is roughly the same as the share of the population and the economic activity in the province's coastal areas.

3.3. Variables and Descriptive Statistics

Table 1 shows the variables, how these were operationalized into questions, the response alternatives, and the distribution of answers. The *dependent variable* is whether the respondent has ever received a bank loan.

The core *explanatory variable* is a dummy variable, which was the respondents' membership in a cooperative.

Given our interest in analyzing heterogeneity in the impact of cooperative membership on farmers' bank loans and determining how farmers' social capital could affect their availability of bank loans, it is crucial to measure the different categories of social capital that the farmers have. This includes the farmers' relations in banks and governmental offices, their acquaintances from off-farm work as well as their financial knowledge (cognitive, social capital, which is related to resources that provide shared meanings and interpretations within social groups).

Two categories of *control variables* were identified. Farmers' credit availability may be affected by individual characteristics and household characteristics [41–43]. The individual's characteristics include the respondents' age, education, credit understanding, income level, etc. The second category consists of household characteristics, including source of income, size of household, and housing situation.

The instrumental variable "share of villagers participating in cooperatives" (RPC) takes the value of one if the ratio is greater than 50% and zero otherwise. Before further processing the data, we estimate the relationship between the instrumental variable, the explanatory

variables, and the dependent variable using regression models. The instrumental variables and the dependent variable are negatively correlated at a 1% confidence level, while in the regression analysis of the instrumental variables and the dependent variable, the result shows that the instrumental variable and the dependent variable are highly irrelevant. Hence, the "share of villagers participating in cooperatives" is exogenous relative to the respondents' availability of loans.

Table 1. Description of farmers' characteristics.

Variable Name (Variable Symbol)	Measurement and Evaluation	Minimum	Maximum	Mean	S. D.
Farmers with bank loan (LOA)	Have you ever received a bank loan? Yes = 1; No = 0	0	1	0.423	0.494
Cooperative membership (CM)	Are you a member of a cooperative? Yes = 1; No = 0	0	1	0.319	0.466
Banking or governmental relationships (BGR)	Do you have any relatives or friends working in government or banks? Yes = 1; No = 0	0	1	0.249	0.433
Off-farm work experience (OFW)	Do you have personal experience of work other than farming? Yes = 1; No = 0	0	1	0.408	0.492
Knowledge of credit policy (KCP)	Do you know the credit policy? Yes = 1; No = 0	0	1	0.633	0.482
Age (AGE)	What is your age? under 30 = 1; 31–50 years = 2; Above 51 = 3	1	3	2.480	0.631
Education (EDU)	What is your education level? 1 = No education; 2 = primary school; 3 = junior high school; 4 = senior high school or similar; 5 = college or above.	1	5	0.960	0.892
Source of income (SINC)	Does your family income mainly come from farming? Yes = 1; No = 0	0	1	0.374	0.484
Income (INC)	What was your personal total income last year? Less than 10,000 yuan = 1; More than 10,000 but less than 30,000 = 2; More than 30,000 but less than 50,000 = 3; More than 50,000 but less than 100,000 = 4; More than 100,000 = 5	1	5	2.725	1.204
Household size (HS)	What size is your household? Less than 2 persons = 1; 3–5 persons = 2; More than 5 = 3	1	3	2.105	0.631
Size of dwelling (SDW)	How many square meters is your dwelling? 90 and below = 1; 90–150 m^2 = 2; 150 m^2 and above = 3	1	3	2.427	0.757
Share of villagers participating in cooperatives (RPC)	What percentage of farmers in the same village participate in cooperatives? No less than 50% = 1; Less than 50% = 0	1	0	0.183	0.387

According to Table 1, about 31.9% of the respondents are members of a cooperative. Many farmers may have applied for a bank loan, but only 42.3% of the respondents actually obtained a loan.

Table 2 shows that cooperative members and non-members are different in many respects. The members are significantly more prone to borrowing. However, an analysis of the mean value of variables does not reflect the relationship between the cooperative membership and the farmers' possibility of obtaining a bank loan. For such an analysis, a more rigorous econometric approach is needed.

Table 2. Average difference between cooperative members and non-members.

Variable	Members (*n* = 237)	Non-Members (*n* = 506)	Difference
Farmers with bank loan (LOA)	0.510	0.381	−0.129 ***
Banking or governmental relationships (BGR)	0.481	0.140	−0.341 ***

Table 2. *Cont.*

Variable	Members (*n* = 237)	Non-Members (*n* = 506)	Difference
Off-farm work experience (OFW)	0.561	0.336	−0.225 ***
Knowledge of credit policy (KCP)	0.608	0.644	0.036
Age (AGE)	2.177	2.622	0.445
Education (EDU)	2.907	2.984	0.077
Source of income (SINC)	0.544	0.294	−0.250 ***
Income (INC)	2.755	2.711	−0.044
Household size (HS)	1.907	2.197	0.290 ***
Size of dwelling (SDW)	2.173	2.545	0.372 ***

Note: *** represents significance at the 1% level.

4. Results

4.1. Benchmark Model Results–Determinants of Bank Credit Availability

Table 3 shows the base estimate for the factors affecting farmers obtaining bank loans, estimated by the Logit model (Equation (1)). Because the coefficients of the explanatory variables are not straightforward to interpret, we present the results of the marginal effects estimations in the table's right-hand panel. Table 3 shows a correlation between cooperative memberships and farmers' availability of bank loans. The correlation is positive at a significance level of 10%. Moreover, the marginal effect is 0.078, implying that members had a 7.8% higher probability of obtaining a loan.

Table 3. Estimation results of factors that influence farmers' access to bank credit.

Variable	Basic Model		Marginal Effect Model	
	Coef.	Std. Err	Coef.	Std. Err
Cooperative membership (CM)	0.372 *	0.197	0.078 *	0.041
Banking or governmental relationships (BGR)	−0.103	0.207	−0.022	0.044
Off-farm work experience (OFW)	0.749 ***	0.173	0.157 ***	0.035
Knowledge of credit policy (KCP)	0.939 ***	0.177	0.197 ***	0.035
Age (AGE)	−0.173	0.145	−0.036	0.030
Education (EDU)	0.267 ***	0.0986	0.056 ***	0.020
Source of income (SINC)	0.191	0.173	0.040	0.036
Income (INC)	0.205 ***	0.0721	0.043 ***	0.015
Household size (HS)	0.188	0.136	0.039	0.028
Size of dwelling (SDW)	−0.198 *	0.117	−0.042 *	0.024
Cons	−2.264 ***	0.592		
LR chi2 (10)	109.240			
Log likelihood	−451.452			

Note: ***, and * represent significance at the 1% and 10% levels, respectively.

Social capital affects the farmers' access to bank loans. Specifically, off-farm work experience, which was statistically significant at the 1% level, had a positive effect on their access to bank loans. Table 3 also shows that farmers' knowledge of credit has a significant and positive effect. According to the marginal effect, farmers with off-farm work experience had a 15.7% higher probability of obtaining bank credit, while Members with credit knowledge had a 19.7% higher probability of obtaining bank credit. However, farmers' relatives and friends in government or banks were not related to their access to loans here.

4.2. Estimated Results Controlled for Endogeneity

After having arrived at results without considering eventual endogeneity problems, we continued by estimating model results by introducing instrumental variables using IV-probit models. This was done in two steps. The first was the falsification test on the selected instrumental variable [37]. The Wald test of homogeneity results (*p*-value = 0.0736) shows that the cooperative membership variable is an endogenous explanatory variable. In the

second analysis, we tested the correlation between the endogenous variable (cooperative membership) and instrumental variables (share of villagers' participation). The results of weak instruments tests show that the *p* values of AR and Wald test are significant at the level of 5%, implying that weak instruments were not a concern. The above results show that there may be some deviation in the results of regression analysis by using the Logit model, and the method of introducing instrumental variables is appropriate.

Compared to the Logit results, the IV-probit model generally showed stronger effects of cooperative membership on farmers' access to credit (Table 4). The correlations were statistically significant at the 1% or 5% levels. This underlines the need to use diverse empirical approaches to address selection bias due to unobserved confounds. The main reason is that the Logit model treated participation in cooperatives as an exogenous variable in the regression. A conclusion is that hypothesis 1 is supported by the data.

Table 4. Estimates of the IV-probit model.

| Variable | Cooperative Membership (CM) | | Farmers with Bank Loan (LOA) | |
	Coef.	Std. Err	Coef.	Std. Err
Cooperative membership (CM)			1.036 **	0.423
Share of villagers' participation (RPC)	0.0587 *	0.0321		
Banking or governmental relationships (BGR)	0.234 ***	0.0372	0.383 ***	0.117
Off-farm work experience (OFW)	−0.0199	0.031	−0.286	0.166
Knowledge of credit policy (KCP)	−0.103 ***	0.0264	0.551 ***	0.107
Age (AGE)	−0.0359 **	0.0178	0.0055	0.104
Education (EDU)	0.151 ***	0.0309	0.194 ***	0.0593
Source of income (SINC)	0.0283 **	0.013	−0.00468	0.123
Income (INC)	−0.0689 ***	0.0243	0.0938 **	0.0474
Household size (HS)	−0.0338	0.0212	0.173 **	0.0843
Size of dwelling (SDW)	0.257 ***	0.0392	−0.0818	0.0732
Constant term (*Cons*)	0.658 ***	0.105	−1.985 ***	0.431

Note: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Likewise, the other social capital variables have a significant positive effect on access to credit–non-farming experience, banking or governmental relationships, and financial knowledge. Table 4 also shows some determinants of cooperative participation. Respondents' age, education, size of dwelling, and source of income had a significant effect on the participation. The instrumental variable of "Share of villagers participating in cooperatives" (RPC) showed a significant and positive effect on the choice of farmers' cooperative participation due to the peer effect.

4.3. Heterogeneity in the Impact of Cooperative Membership on Farmers' Credit Access

If the results in Table 4 are only to estimate how farmers' cooperative membership is related to their availability of credit, the outcome may be biased, for it does not reveal anything about the structural differences among farmers with different social capital levels. A way to study heterogeneity is to divide the samples into sub-samples and test them respectively. Therefore, we use a grouping test to explore whether there are differences in the effect of farmers with different social capital in relation to access to credit. Tables 5–7 show outcomes of heterogeneity in the impact of farmers' credit access on cooperative membership based on the IV-probit model.

Table 5 shows grouped regressions of the samples of farmers with and without relatives and friends in the government or banks, respectively. The results show that belonging to a cooperative has no significant impact on farmers, with relatives and friends in government or financial institutions obtaining credit. It has, however, a positive and significant impact on farmers without relatives and friends in government or financial institutions. Membership in a cooperative can make up for the shortcomings in social relations, enhancing farmers' social capital and improving the availability of credit.

Table 5. Heterogeneity in the loan availability of cooperative membership by BGR.

Variable	Banking or Governmental Relationships (BGR) = 0		Banking or Governmental Relationships (BGR) = 1	
	Coef.	Std. Err	Coef.	Std. Err
Cooperative membership (CM)	1.401 ***	0.436	0.608	0.91
Banking or governmental relationships (BGR)				
Off-farm work experience (OFW)	0.349 **	0.136	0.408	0.256
Knowledge of credit policy (KCP)	0.587 ***	0.121	0.448 *	0.266
Age (AGE)	0.107	0.11	−0.22	0.274
Education (EDU)	0.212 ***	0.0725	0.186 *	0.102
Source of income (SINC)	−0.0244	0.136	−0.133	0.256
Income (INC)	0.122 **	0.0603	−0.0577	0.0885
Household size (HS)	0.178 *	0.0968	0.102	0.182
Size of dwelling (SDW)	−0.105	0.0837	0.0311	0.143
Cons	−2.405 ***	0.442	−1.083	1.277

Notes: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Heterogeneity in the loan availability of cooperative membership by NF.

Variable	Non-Farming Experience (NF) = 0		Non-Farming Experience (NF) = 1	
	Coef.	Std. Err	Coef.	Std. Err
Cooperative membership (CM)	0.877 *	0.499	1.219	0.859
Banking or governmental relationships (BGR)	−0.236	0.216	−0.397	0.314
Off-farm work experience (OFW)				
Knowledge of credit policy (KCP)	0.651 ***	0.141	0.404 **	0.183
Age (AGE)	0.0532	0.145	−0.0107	0.169
Education (EDU)	0.229 ***	0.0863	0.160 *	0.0831
Source of income (SINC)	0.110	0.143	−0.266	0.284
Income (INC)	0.164 **	0.0638	−0.00676	0.0846
Household size (HS)	0.289 **	0.117	−0.0167	0.123
Size of dwelling (SDW)	−0.0715	0.0968	−0.0286	0.13
Cons	−2.765 ***	0.634	−0.735	0.662

Notes: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Heterogeneity in the loan availability of cooperative membership by KCP.

Variable	Knowledge of Credit Policy (KCP) = 0		Knowledge of Credit Policy (KCP) = 1	
	Coef.	Std. Err	Coef.	Std. Err
Cooperative membership (CM)	0.661	0.63	1.349 **	0.537
Banking or governmental relationships (BGR)	−0.161	0.261	−0.395 *	0.215
Off-farm work experience (OFW)	0.620 ***	0.196	0.226	0.148
Knowledge of credit policy (KCP)				
Age (AGE)	0.134	0.184	−0.0865	0.128
Education (EDU)	0.0679	0.119	0.226 ***	0.0781
Source of income (SINC)	0.122	0.202	−0.113	0.155
Income (INC)	0.164 *	0.0898	0.0675	0.0546
Household size (HS)	0.243 *	0.145	0.167	0.103
Size of dwelling (SDW)	−0.308 ***	0.115	0.0869	0.0994
Cons	−1.842 **	0.81	−1.593 ***	0.512

Notes: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

The regression analysis of the last two samples of farmers who have agriculture as their main income source shows that belonging to cooperatives has a positive impact on the farmers' availability of credit. When the income mainly comes from agriculture, this indicates that farmers who rely economically on cooperatives have greater opportunities to obtain bank loans if they are a member of a cooperative. In addition, the results show that there is a significant positive correlation between education, household size, income,

and the availability of credit. Therefore, the result in Table 5 indicates that hypothesis 2A is supported by the data.

Table 6 indicates that cooperative members are more likely to obtain a bank loan compared to non-member farmers when they have no off-farm experience. Again, the sample was divided into two groups. The results show that a cooperative membership promotes the availability of credit for farmers who only have farming experience. Therefore, farmers without contacts outside agriculture have a higher chance of obtaining a bank loan if they are members of a cooperative, which means that hypothesis 2B is supported.

Lastly, we split the sample into two groups using knowledge of credit policy and analyzed credit access effects for each subgroup. Table 7 shows that cooperative membership improved farmers' possibility of obtaining a bank loan for those who understand credit policy. Thus, hypothesis 2C receives support.

To sum up, cooperative members are more likely to obtain a bank loan compared to non-members when they have no experience of off-farm work and no relatives and friends in government or banks. For farmers with more financial knowledge, a cooperative membership is more conducive to obtaining bank credit support.

4.4. Results of Balance Test from Endogenous Switching Regression

In order to test the robustness of the model results concerning the relationship between cooperative membership and bank credit access, we used endogenous switching regression (ESR). This model, proposed by Lokshin and Sajaia [44], concerns how the problem of recessive bias can be avoided.

As can be seen in Table 8, membership in a cooperative has a significant impact on farmers' credit availability. Factors (a) and (b) represent the factual result of the credit availability of farmers who are members and the counterfactual result of credit availability for non-members. The difference between (a) and (b) represents the average processing effect (ATT) of joining cooperatives on the credit availability of farmers in the experimental group. It is seen that when farmers who joined cooperatives leave cooperatives, their credit availability level decreases by 0.24 (a decrease of 47%). Factors (c) and (d) represent the counterfactual result of credit availability for farmers who do not join cooperatives and the factual result of credit availability for farmers who do not join cooperatives. The difference between (c) and (d) represents the average processing effect (ATU) of credit availability for farmers in the control group. It is seen that when farmers who do not join cooperatives join cooperatives, their credit availability increases by 0.21 (an increase of 55%). Therefore, cooperative membership means that farmers have better access to credits.

Table 8. Balance test result from ESR model.

Type of Household	The Probability of Obtaining a Loan		ATT	ATU	Std.Err.	Relative Difference	T-Statistics
	Member	Non-Member					
Member	(a) 0.510	(b) 0.270	0.240 ***	——	(0.018)	47%	13.34
Non-member	(c) 0.593	(d) 0.382	——	0.211 ***	(0.012)	55%	17.94

Notes: The Wald test rejects the original hypothesis that the behavior equation and the result equation are independent of each other at the 1% level, and the square root of the residual variance of the behavior equation and the two result equations is significantly non-zero at the 1% level, indicating that unobtainable factors simultaneously affect both whether farmers join cooperatives and their credit availability; moreover, the selectivity bias must be corrected. This indicates that it is reasonable to use the endogenous transformation model (ESR) for sample analysis. *** represent significance at 10% levels.

5. Discussion

5.1. Farmers' Social Relationships within Cooperatives

The finding that the social capital that farmers enjoy in their cooperatives and other social relations implies that they have better access to bank loans is in line with what Kehinde and Ogundeji found in Nigeria [21] (p. 1): "[T]he farmers in the area have organized themselves into social capital networks in order to gain access to credit services." It is

also in agreement with many other studies, which show that farmer cooperatives in poor countries provide valuable services to their members [45–50]. For example, in their study of Ethiopian cooperatives, Abate et al. [16] (p. 257) wrote, "[A]gricultural cooperatives enhance members' efficiency by easing access to production inputs and facilitates extension linkages." Other studies further indicate member benefits from cooperatives thanks to the social capital within the membership [51,52].

While the present study concerns small-scale farmers, the findings are in line with what Peng et al. report about large-scale Chinese farmers [5]. That study indicated that cooperative members have better access to credits thanks to lower transaction costs and less information asymmetry in their relations to financial institutions. Both of these constructs are related to social capital because social exchanges involve trust, reciprocity, and communication.

Thanks to their cooperative membership, farmers' relationships with each other are characterized by bonding social capital or at least bridging social capital, while their relationships with the leadership are more likely characterized by linking social capital [45]. Thus, the members influence each other, and the leadership has the possibility to support the members, for example, by offering help in issues concerning bank loans and by reducing uncertainties by providing guarantees.

5.2. Farmers' Social Relationships in Banks and Government

Farmers' social relationships within financial or governmental sectors may be the key factor for obtaining bank credit [10]. Personal relationships are likely to result in bank loans, but there is a significant difference between cooperative members and non-members. Members are less likely to exploit their friends and relatives in power positions. The social capital within the cooperative rules out the importance of personal relations.

Among farmers who have no banking or governmental connections, members are more likely to obtain a bank loan than non-members. For these farmers, cooperative membership is strongly related to the chance of obtaining a bank loan. The social capital that presumably exists between the cooperative leadership and the outside power holders will help the members to obtain a loan. This may solve the problems of information asymmetry and moral hazards.

5.3. Farmers' Social Relationships through Off-Farm Work Experience

Among farmers without experience in non-farming businesses, members have a significantly higher chance of obtaining bank loans than non-members. This outcome is not significant for the subgroup of farmers who have off-farm work experience. Off-farm work gives farmers a chance for social capital from outside their villages and provides greater financial knowledge. Similarly, Peng et al. report that farmers who have relationships with other firms within the value chain face less information asymmetry [5]. These authors also note that farmers with off-farm experiences are better educated and have a better economy, which may indicate better financial knowledge.

External acquaintances are typically characterized by social equality (bonding social capital). Farmers with off-farm work experience are more likely to succeed in obtaining a bank loan as they have better personal communication skills. However, farmers without off-farm experiences are more likely to be dependent upon agriculture and their cooperatives. Because of this dependency, they want to invest in their farming operations. At the same time, these farmers do not have assets that suffice as collateral. This implies that farmers without off-farm experiences are more enthusiastic about their cooperatives and may gain recognition as cooperative members by the banks when applying for a loan. Thus, membership of the cooperative has a significant effect on these farmers' access to bank loans [13].

5.4. Farmers' Financial Knowledge and Bank Credit Access

This study supports the general notion that financial knowledge is important in people's contact with financial institutions. The better the financial knowledge the investigated farmers have, the higher their cognitive and social capital, which is conducive to their access to credit.

In the group of farmers with more financial knowledge, cooperative members are more likely to receive credit than non-members. A possible explanation is that cooperatives can enhance members' social capital [15]. Farmers with much cognitive social capital will be better at converting the social capital of cooperatives into material capital, such as obtaining credit. With the expansion of the scope of their economic exchanges and the change in their sense of concept, they are able to develop mutually beneficial exchanges with other knowledgeable individuals. Thanks to their cooperative's resources, they can expand their social networks, and their goal of building social capital will gradually result in a high chance of enabling access to bank loans.

6. Conclusions and Implications

6.1. Conclusions

Numerous studies in both developed and less developed countries show that cooperatives support their members in many respects, such as the provision of goods and services, the dissemination of market information, and the securing of reliable marketing channels. The literature on the role that cooperatives play for members who need to borrow capital is, however, extremely limited, and no previous study has provided a coherent theoretical explanation. Based on social capital theory, the present study contributes to the theoretical knowledge about the functions of cooperatives in the specific function of supporting members who seek bank loans.

The present study presents empirical evidence for why cooperative memberships are important for farmers in need of financial capital. Firstly, the study shows that members have a higher probability of obtaining a bank loan compared to non-members. The farmers' membership in a cooperative signals credibility with the banks, and the members receive support from one another and from the cooperative leadership. The social capital in the relations between the cooperatives' leadership and the banks and government is also due to have an impact on members' chances of obtaining a bank loan.

Secondly, among farmers who have no acquaintances in banks and government and those who have no experience of off-farm work, cooperative membership positively influences the chance of obtaining a bank loan. An explanation is that the social capital within the cooperative membership is more important than the members' external personal relations. As non-member farmers do not receive such support from a cooperative, they are more likely to ask for help from their friends and relatives in banks and government as well as people they have met as migrant workers.

Finally, among farmers with better financial knowledge (cognitive social capital), the cooperative members are more likely to receive credit support than non-members. When farmers with good financial knowledge participate in a cooperative, the social relationships within the membership give them a strong incentive to perform well in financial matters, and they are able to use the social resources of their cooperative.

Through the above theoretical analysis and empirical estimation, two theoretical implications and two practical implications were obtained. In terms of the theoretical implications, first, the literature on how farmers' chance of obtaining a bank loan is related to the social capital that they receive from their cooperative membership is quite inexistent. The conclusion further supports the theory of social capital from cooperatives can indeed promote farmers' access to bank credit. Second, the conclusion further enriches the cooperative theory by verifying the positive role of cooperatives in microfinance extension. In terms of the practical implications, first, the conclusion provides empirical evidence for the financial function of cooperatives to farmers; that is, the intervention of cooperatives is conducive to alleviating the adverse selection problem caused by information asymmetry

between farmers and financial institutions. Second, the research points out the direction for further improving the financial effect of cooperatives. That is, the financial objectives of cooperatives should focus on households with lower levels of primitive social capital. In addition, the improvement of farmers' financial knowledge is also conducive to farmers' use of cooperative resources to obtain credit assistance. Therefore, governments or social organizations are encouraged to strengthen financial knowledge training for farmers through various forms.

6.2. Limitations and Suggestions for Further Research

Because of the high statistical significance noted in this study and the fact that the data was collected in collaboration with a well-established nationwide governmental research program, the findings must be considered valid for farmer cooperatives in Fujian Province in 2018–2019. It is likely that the conclusions are valid also for other parts of China and, to some extent, in other developing countries because many other studies confirm the importance that farmer cooperatives have for the rural population in poor countries. However, there is a need for further research about how various institutional structures affect the financial problems that rural people are facing, as well as how and why these problems are developing over time.

The empirical findings are less likely to be applicable in Western countries. In these countries, there are fairly low barriers between the farmers and the financial institutions. The information asymmetry is limited, and thus, the transaction costs are low. One reason is the widespread existence of different kinds of cooperative banks, and another one is that commercial banks often have special departments for credit to farmers. The social, economic, and legal conditions for a similar organizational structure in poorer countries would be an important field of research.

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