

Financial Literacy, Policy Incentives and Farmers' Housing Mortgage Demands

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Abstract—The research based on the survey figures of 708 rural households in Sichuan province and Chongqing city, explaining the mechanism of financial literacy which affects the farmers' housing mortgage loans, and verifies the path relationship between evaluation of the participated farmers and the farmers' housing mortgage demands. Findings suggest that financial literacy has a significant positive impact on farmers' housing mortgage loan demands, and the impact will be improved due to strong policy incentives.

Keywords—Factor analysis, Probit regression, Financial literacy, Policy incentives, Housing mortgage

I. INTRODUCTION

With the intensification and scale of agricultural management, the development of new agricultural entities, farmers with limited capital accumulation capacity are increasingly demanding for production and operating funds. The development of formal financial loans can meet the needs of some of the farmers' funds, thus significantly reducing the breadth and depth of poverty (Imai 2012). However, farmers lack the effective collateral which is required by formal financial institutions, and this constraint has been an important reason for farmers' financing difficulties. With the gradual improvement of the economic value of rural houses, how to play the asset attributes of rural houses has become the highlight of China's rural financial innovation. Based on this background, the People's Bank of China issued the Interim Measures for the Pilot Project of Farmers' Housing Property Mortgage Loan in March 2016. As of the end of September 2017, the balance of mortgage loans for farmers' housing property rights in the pilot areas with nationwide was RMB19.6 billion.

Rural housing mortgage loans have problems such as small overall size and insufficient effective demand of farmers. Although the mortgage financing of rural houses is considered to be an important choice for farmers' financing, it is not very optimistic about the actual situation of the pilot areas. The reasons for the difficulty of pilot areas to promotion include the lack of awareness of farmers, the aversion to risks, and the difficulty in realizing the disposal of farm houses. In the final analysis, increasing the acceptance of farmer housing mortgage loans is the choke point for expanding the influence of rural mortgage loans. The existing literature mostly studies on the influencing factors such as personal and family characteristics, mortgage interest rate and risk, and farm house characteristics, but ignores the influence of farmers' own financial literacy on the choice of mortgage behavior and risk perception. In 2015, the People's Bank of China's did a survey about consumer financial literacy, they found that Chinese residents' financial literacy was very poor, while urban residents' financial literacy was significantly higher than that of rural residents. The lack of financial literacy may lead rural residents to abandon their possibility to take participation in loans because of their misunderstanding of the content or the availability of mortgage loans, which has inhibited the effective demand of farmers and hindered the effective promotion of financial services in rural areas.

II. RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

A. Literature on Farmers' Housing Mortgage Demands

Farmers as the main body of demand for loan behavior, farmers who generally hate risk (Ellis 1988) can have a positive response to rural mortgage loans? Regrettably, the existing research has found that farmers' willingness to participate in housing mortgage loans is generally low, and regional development is uneven. By establishing a logistic model, the influencing factors are divided into individual characteristics of farmers, family endowments, collateral characteristics, and farmers' perceptions. It is found that loan experience and interest rates will significantly affect farmers' willingness to participate in rural house mortgage loans (He et al. 2016). In addition, some scholars have studied based on farmer differentiation and intergenerational differences and found that farmers with higher occupational differentiation have stronger willingness to participate in rural house mortgage loans (Liu et al. 2016).

B. Literature on Financial Literacy and Credit Behavior

Financial literacy refers to the ability to use and manage the funds to make informed judgments and effective decisions (Noctor 1992). More and more scholars are paying attention to the influence of financial literacy on residents' financing behaviors. It is generally believed that financial literacy is one of the decisive factors affecting family financial behavior (Bernheim 2001; Lusardi and Mitchell 2014). Participants with higher financial literacy will be more likely to choose a lower-cost lending method, preferring formal financial lending (Chatterjee 2013), and there will be a lower probability of credit overdue behavior (Fedorova 2015; Henager 2015).

Through literature reviewing, we can find that there are still some shortcomings in the existing research: Firstly, the lack of exploration of the deep-seated factors affecting the demand for rural mortgage loans. Secondly, there is a gap between the pilot and non-pilot sites in terms of enthusiasm and experience. Some studies have neglected the differences between regions with different policy bases. In view of this, this paper explores the impact of financial literacy as a core variable on loan demands, and investigate the different intensity of policy incentives to change the willingness of financial literacy to lead to rural mortgage loans, thus providing more adequate advice for the rural house mortgage loans business promotion.

C. Hypothesis Development

First, because farmers with higher financial literacy will make better predictions and comparisons on the loan cost, expected return and availability of different financing methods, they may be more inclined to choose to abandon informal credit and choose rural mortgage loans. Secondly, As the level of financial literacy increases, it will significantly increase individuals' perceptions of financial products and their risks, thereby the risk appetite increases. Therefore, farmers with higher financial literacy may have higher risk appetite (Lucarelli 2015). Lower loan costs and better credit can help improve the credit participation of farmers. Therefore, financial literacy can jointly affect the needs of farmers by improving farmers' formal credit needs, risk appetite and participation ability. We state our hypothesis in the alternative form:

Hypothesis1: Financial literacy has a positive impact on farmers' housing mortgage demand

Although the business of rural house mortgage loans began to be comprehensively promoted in early 2018, there was a certain gap between the non-pilot areas and the pilot areas in terms of policy support, bank enthusiasm, and farmers' awareness. Under the propaganda and urging of the local government in the pilot area, not only farmers' understanding of rural house mortgage loans has deepened, but financial institutions have greater enthusiasm for supply. We state another hypothesis in the alternative form:

Hypothesis2: The positive impact of financial literacy on the demands for farmer's housing mortgage loans will be enhanced by stronger policy incentives.

III. RESEARCH DESIGN

A. Samples and Description Statistics

The research figure comes from the research team selected 7 counties in Sichuan and Chongqing from July to August 2017 for field research. Each county randomly selects 3~4 townships, and each town randomly selects 2~3 villages. Each village randomly selects 8~18 households and adopts the questionnaire survey of household interviews. A total of 730 questionnaires were distributed this time. After eliminating invalid questionnaires such as missing data and content contradictions, a total of 708 questionnaires were effectively collected.

1) Dependent Variable Farms' Housing Mortgage Demands

In the household survey process, the respondent is first asked "Will you consider participating in a rural mortgage loan?". If the answer is "Yes," then it is considered to have the need to participate in rural mortgage loans. If the answer is "No", it is considered that it does not participate in the demand for rural mortgage loans.

2) Core Independent Variable: Financial Literacy

According to Lusardi (2014), the method of dealing with financial literacy evaluation indicators, the difference between the two answers "not knowing" and answering is wrong. The financial literacy of the farmers who do not know the answer will be worse. Therefore, when evaluating the financial literacy of the farmers, set 3 to 4 answers, and set two dummy variables for each evaluation question. The first dummy variable is whether the farmer can answer it, and then the second dummy variable is whether the farmer can answer correctly. The KMO value of the item is 0.614, and the sample is suitable for factor analysis of this method. By factor analysis of 10 dummy variables, after extracting the common factor whose eigenvalue is greater than 1, the cumulative variance contribution rate of the five factors is 88.20%, and the weight of the variance contribution rate is calculated to obtain the financial literacy of the farmers.

3) Farmers' Financial literacy assessment

a) Supposing you have saved RMB100 in the bank and the annual interest rate of the deposit is 2%. There is no withdrawal in the account. How much can the account be with after two years? The options are: do not know, less than or equal to 104, greater than 104; b) Supposing your savings account has an annual deposit rate of 1% and inflation is 3% per year. What is the amount of money you can buy in your account after 1 year? The options are: do not know, change more, just as the same, less; c) In general, the higher the return is, the greater the risk is. Do you agree with this statement? The options are: do not know, disagree, agree; d) Do you think the risk of buying a stock fund is less risky than buying a stock? The options are: do not know,

yes, no. e)Supposing you have a record of overdue loans in Bank A, and then the same collateral has encountered more reviews and higher interest rates when applying for a B bank loan. Do you agree with the banking practice? The options are: do not know, disagree, agree.

4) Control variables

This paper sets 14 control variables to reflect the individual characteristics, family characteristics, farm house characteristics and decision-making environment which affects farmers. The definition, assignment and descriptive statistics of each variable are shown in Table I.

Table I

	Variables	Assignment	Mean	Std. dev
Dependent Variable	Rural house mortgage loan demands	No=0, Yes =1	0.28	0.44
Core Independent Variables	Financial literacy	Factor analysis	7.15E-07	0.57
Control Variables				
Individual Characteristics	Gender	female=0, male=1	0.72	0.49
	Age	Actual value	51.77	10.23
	Working experience	No=0, Yes=1	0.91	0.34
	Education	Elementary school =1, junior high school =2,high school =3	1.98	0.71
	Risk preference	Risk aversion =1, Risk neutral =2,Risk loving=3	2.12	0.49
Family Characteristics	Total family population	Actual value	4.16	1.54
	Annual average net income of family	Actual value	5.75	16.24
	Farmer differentiation	Pure agriculture =1, Lowly concurrent =2, Highly concurrent =3, Non-agricultural =4	2.74	1.13
	Participate in insurance	Did not participate in any social security =0, Participate in the new rural cooperative medical insurance or the new rural pension insurance=1,Both participated =2	1.89	0.4
	friends or relatives working for Bank	No=0, Yes=1	0.04	0.19
Farm House Characteristics	House acreage	Actual value	217.87	161.3
	Homestead disposal rights	Non-disposable =1, After the village collective consent =2, Freely disposable =3	2.44	0.84
	Distance from financial institutions	Very far =1, Relatively far =2,general=3, Relatively close =4, Very close =5	3.72	0.71
Decision-making Environment	Affected by official publicity	Cannot affect at all=1, Less affection =2,great affection=3	2.02	0.88

Assuming that Y_i^* is a binary dependent variable, indicating whether farmers have the need to participate in rural mortgage loans. There are only two choices, namely “considering participating” and “do not consider participating”. Based on the explanatory variable is a dummy variable, and the purpose of the research is to analyze the impact of financial literacy on the needs of farmers, so in this paper, the Probit model is used for binary regression analysis, and i is used to represent individual farmers. The specific model form is following:

$$Y_i^* = \alpha FL_i + \beta X_i + \varepsilon_i$$

$$\text{If } Y_i^* > 0, \text{ then } Y_i^* = 1; \text{ otherwise } Y_i^* = 0 \quad (1)$$

In the formula (1), i denotes the individual farmer; Y_i^* is the explanatory variable, indicating the demands of the farmer to participate in the mortgage of the house; FL_i indicates the financial literacy level of the farmer, α indicates the coefficient to be evaluated of the core independent variable; X_i indicates The control variable that affects the demand for mortgage loans in rural houses; β is the estimated coefficient of control variables; ε_i is the random error term.

IV. RESULT

A. Questionnaire reliability Analysis

The credibility index (Cronbach's α) index is used to measure the reliability of the questionnaire figures. After the reliability analysis, the coefficient value of Cronbach's α is 0.781. Therefore, the reliability of the questionnaire used to study the needs of farmers is reliable.

B. Sample Regression Analysis

The financial literacy estimates for the full sample of farmer household housing mortgage loans are shown in Table 2. Financial literacy is significantly positively correlated with farmers' housing mortgage loan demands at the 1% level. This result is consistent with the result of the first hypothesis. The results indicate that farmers with higher financial literacy will be more likely to generate demand for participation in rural housing mortgages.

As far as the model estimation results of other control variables are concerned, there is a significant negative influence on the age of 10%, which explains the older age farmers have a more conservative attitude towards the new financial business of rural housing mortgage loans. The annual average net income of every households and the differentiation of farmers showed a significant positive impact at the levels of 5% and 1%, respectively. The high annual income family more likely it is that there

are two kinds of situations: the first one is a large-scale farming-based household, and the large-scale farmers have higher capital needs than the average farmers in daily production activities. The second type is farmers who are mainly migrant workers. This part of the farmers is more likely to translates the farmhouse utility of the guarantee into asset, because of the weakening of the rural housing emotional bond which is caused by long-term non-agricultural production, and the weakening of the rural housing security. The level of participation in the social insurance has a significant positive impact on the 10% level, indicating that farmers with high level of participation may have a higher acceptance of the risk of rural housing mortgage loans. Whether there are relatives or friends working in the bank or rural credit cooperatives has a significant positive impact on the 1% level, indicating that the conditions of relatives and friends in financial institutions can improve the financial availability of farmers. The decision-making by the official influence has a significant positive impact on the 5% level, indicating that official propaganda such as news will bring more effective information and confidence to the farmer to take participate in house credit.

In the sample regression, financial literacy has a significant positive impact on farmers' participation in rural housing mortgage loans at the 5% and 1% levels. The marginal effect of the strong policy incentive sample is 0.185, which is greater than the marginal effect of the weak policy incentive sample of 0.149, indicating that the positive impact of financial literacy on the farmers' housing mortgage loan demand is improved by the influence of strong policy incentives. So, the second hypothesis was proved.

From the regression results of others control variables, age and participate in insurance are positively positive in the regression of strong policy incentive samples, while the impact on farmers' demand in the weak policy incentive sample is not significant.

TABLE II REGRESSION RESULTS OF THE IMPACT OF FINANCIAL LITERACY ON FARMERS' DEMANDS

Variables	Full sample	Strong policy incentive	Weak policy incentive
Financial literacy	0.151***(0.040)	0.185*(0.061)	0.149**(0.056)
Gender	0.232(0.087)	0.089(0.046)	0.177(0.063)
Age	-0.003*(0.002)	-0.006*(0.003)	-0.004(0.003)
Working experience	0.152(0.089)	0.133(0.057)	0.203(0.059)
Education	0.125**(0.032)	0.144*(0.029)	0.116*(0.035)
Risk preference	0.217***(0.047)	0.243**(0.035)	0.197**(0.044)
Total family population	-0.009(0.022)	-0.007(0.031)	-0.011(0.016)
Annual average net income of family	0.054**(0.027)	0.090**(0.019)	0.048*(0.033)
Farmer differentiation	0.225***(0.041)	0.167**(0.053)	0.240***(0.047)
Participate in insurance	0.089*(0.040)	0.103*(0.032)	0.075(0.061)
friends or relatives working for Bank	0.239**(0.063)	0.255***(0.061)	0.208**(0.050)
House acreage	-0.007(0.038)	0.001(0.034)	-0.009(0.024)
Homestead disposal rights	0.011(0.042)	0.008(0.039)	0.013(0.036)
Distance from financial institutions	0.146**(0.037)	0.150*(0.052)	0.154**(0.033)
Affected by official publicity	0.264***(0.075)	0.288***(0.094)	0.235**(0.069)
Log likelihood value	-732.203	-657.74	-328.636
Pseudo R2	0.091	0.118	0.225
Prob > χ^2	0.000	0.000	0.000

*p<0.1; **p<0.05; ***p<0.01.

The number in parentheses is the standard error, and before the parentheses is the marginal effect.

V. CONCLUSION

Form the micro-perspective of farmers, this paper makes use of the survey data of rural households in pilot and non-pilot areas of rural mortgage loans in Sichuan and Chongqing to conduct an empirical study on the development of rural housing mortgage loan. The following conclusions were obtained:

Overall, farmers' responses to rural housing mortgage loans are not as positive as expected. Farmers' attitudes toward rural new financial services are relatively conservative, and their willingness to participate is still to be further improved. Financial literacy has a significant positive impact on farmers' housing mortgage demands, and the impact will be enhanced by strong policy incentives.

According to the above research conclusions, in order to promote the development of rural housing mortgage loan business, this paper proposes the following policy recommendations:

Active financial literacy education should be carried out in rural areas through various ways. The financial quality of farmers is uneven, so it is necessary to select appropriate and efficient methods and contents after full investigation to improve the pertinence and efficiency of the popularization of financial knowledge.

Local governments and financial institutions should base on the realities of the region and learn to implement regional experiences with other better pilot results, so as to effectively promote rural housing mortgage loan business. Through the promotion and popularization of rural housing mortgage loans to create a better decision-making environment, starting from the loan terms, interest rates and other loan content to provide farmers with more favorable and more competitive financing methods.

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