

# Transaction costs and the scale of farmer loan fund study–based on the survey data from 27 counties in Fujian Province

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**Abstract.** The size of the loan funds obtained from the formal financial institutions reflects the satisfaction degree of the farmers' loan demand and the practical ability of the farmers. In this paper, we measure the characteristics of rural household borrowing transaction costs from five dimensions, the specificity of human capital, the specificity of physical assets, the special position of the geographical location, the uncertainty of loan and the transaction frequency, and the influence of the transaction cost on the scale of farmer's loan funds by Tobit (Censored) model. Results showed that the education level of the households, have productive fixed assets value, housing value at the end of the year, the distance to the recent financial institutions, warranty or guarantee, mortgage, loan period, interest rates, from application to loan to spend money and time in the last two years has positive effect. The values of the livestock, the use of funds for the purpose of farmers' loan funds have a reverse impact.

**Keywords:** Transaction cost; Loan fund scale; Influence.

## 1. Introduction

To solve the problem of the shortage of funds in life and production, the farmers often need to borrow from the formal financial institutions or the private lending institutions. Loan is an important way to solve the funds shortage, farmers' access to the size of the loan fund reflects the degree of satisfaction of the farmers' loan demand and the actual borrowing capacity. On the other hand, it reflects the level of the farmers' repayment ability and the strength of the farmers' economy. Generally speaking, the larger the scales of the loan funds, the farmers have a strong ability to borrow and repay the strength.

In recent years, many researches pay attention to the factors that influence the farmers' credit behavior. However, few research care about the scale or the amount of the loan fund. For instance, Li Yanmin (2008) analyzed the 17 types of rural households' borrowing and lending behavior based on the survey data of rural households in rural areas of the country, and found that the farmers' professional type is closely related to the size of the loan. The difference of the behavior of the farmers' credit is the difference of the loan size. [1]. Cheng Zhonghai (2013) found that the education level, formal borrowing rates can affect the size of formal lending and informal lending [2]. Cheng Yang et al. (2014) showed the size of the cultivated land area and the scales of the farmers' borrowing funds have a significant positive correlation [3]. Tong Xinle et al. (2011) found that the relationship between the farmers' professional cooperative organizations and the formal financial institutions had a significant effect on the farmers' effective lending opportunities and the actual loan amount. [4]. Li Feiya (2014) used the data of NGO poverty alleviation loan and found the value of rural households had a significant effect on the amount of the loan [5]. Jiang Haiyan (2014) used the farmers in Sijia town, Jiangshu province as example, found that farmers with different cultural degrees will affect the peasant household's borrowing scale [6]. Zhang Jun (2013) believed that the channels of household borrowing and lending can affect the size of the loan [7]. Zhou Yueshu et al. (2013) found the formal financial institutions loan amount per household is about twice of the non-formal channels of financing through questionnaire survey of farmers in Nanjing, Jiangsu Xuzhou [8]. Wang Xiaofeng (2006) from the transaction cost economics analysis, and found asset specificity is very high, that is, the borrower's asset size is larger [9].

From above research, we can see that the type of farmers' borrowing, the degree of culture, the value of the interest rate, the value of the house, the channels of the farmers' credit are important factors that affect the scale of farmers' borrowing money. This study attempted to study the factors that affect the size of the loan fund, especially the transaction cost of the scale of farmers' borrowing money.

## 2. Materials and methods

### 2.1 Survey data sources

The data sources of this study come from the rural household of Fujian farmers. We obtained the actual recovery of 500 valid questionnaires from 700 questionnaires. The rural social surveys on the rural households' borrowing situation research are involved in Fujian province. This questionnaire survey involves a total of 27 counties, 249 administrative villages.

### 2.2 Statistical analysis of survey data

In the 500 valid questionnaires, there were 483 households have access to the loan questionnaire, and the proportion of the total questionnaire was 96.6%. There are 270 households have access to loans, accounting for 55.9% of the respondents, there are 213 households without access to loans, accounting for 44.1% of the respondents.

In access to loans of 270 households, the highest amount of the loan amount of ¥500, accounting for 5.6%; ¥500~¥1000 has 5, accounting for 1.9%; ¥1000~¥5000 has 31 households, accounting for 11.3%; ¥5000~¥10000 has 41, accounting for 15.2%; ¥10000~¥50000 has 94, accounting for 35%; 84 more than ¥50000, accounting for 31%.

From the above data, we can see that the scale of rural households in Fujian province is more than 1/3 of the concentration of ¥10000~¥50000, while ¥50000 of the loan is also accounted for 31.1%, ¥5000 less than 18.9% of small loans. It can be seen that the overall size of the loan is relatively high in Fujian province.

### 2.3 Model variable selection

This paper selects the Tobit (Censored) model to estimate the impact of transaction costs on the scale of rural household loan funds. The description of the model is as follows:

$$y_i^* = x_i\beta + \varepsilon_i \quad \varepsilon_i \sim N(0, \sigma^2)$$

$$y_i = \begin{cases} y_i^* = x_i\beta + \varepsilon_i, & y_i^* > 0 \\ 0, & y_i^* \leq 0 \end{cases}$$

Among them,  $y_i^*$  for the  $i$ th farmers scale of loan fund.  $\beta$  is the explanatory variables of the parameters to be estimated;  $\varepsilon_i$  matrix is a random variable, to conform to normal distribution;  $X_i$  representation affects the scale of loans to farmers all transaction cost variables; the so-called data review method is lending to farmers for 0 observation values are reviewed, namely when farmers loan scale of observation value is 0,  $y_i^* \leq 0$  that is less than or equal to 0 can so=0. When the farmers' loan size is not 0, (that is  $y_i^* > 0$ ),  $y_i = y_i^*$  so that the formula can also be expressed as follows:

Through the above transformation, it can be estimated by Tobit method, respectively,  $X_i$  represent the human capital specific variables ( $X1 \sim X8$ ), the physical assets of the specific variables ( $X9 \sim X14$ ), the uncertainty of loan ( $X19 \sim X27$ ), and the transaction frequency( $X30 \sim X32$ ).

### 2.4 Statistical index description

(1) The scale of farmers gets the loan funds (Y)

In this study, we chose the fund size of the farmers to get the loan as the explanatory variable, and the scale of the loan fund is divided into 6 levels. 0=0¥; 1=0¥~¥500, 2=¥500~¥1000, 3=¥1000~¥5000, 4=¥5000~¥10000, 5=¥10000~¥50000, 6=¥50000.

(2) The impact of the loan funds (X)

The transaction costs of human capital characteristics, physical assets, geographic location, borrowing uncertainty, transaction frequency of five dimensions to measure.

(a) Human capital can mainly reflected by the degree of farmers' culture, physical fitness, professional type and family status. We chose 8 variables to measure the degree of X1, X2, X3, X4, X5, X6, X7, and X8.

(b) The specific property of the physical assets is the basic situation of the farmers' possession of real assets. We choose 6 variables to measure, namely: X9--per capita arable land area, X10--Years of planting, X11--Planting area, X12--The value of productive fixed assets, X13--The number of livestock, X14--Housing value at end.

(c) The geographical location of the special financial institutions can reflect the setting of the financial services for farmers. Select 4 variables to measure, respectively, X15 is to the nearest financial institution distance, X16 is the center of the town of distance, X17 is the railway station distance, X18 is the distance to the bus station.

(d) The uncertainty of the loan that affect the farmers' borrowing, including the social capital situation and the mortgage situation of the farmers owned by the environment factors. We selected nine variables to measure, including: X19 is whether through middlemen, X20 is whether warranty or guarantee, X21 is what to warranty or guarantee, X22 is whether members of cooperatives, X23 is whether relatives and friends in the government or financial institution, X24 is UNPROFOR members of the group, X25 is the borrowing period, X26 is interest rate level, X27 is loan funds use mortgage,.

(e) The number of transactions reflects the number of transactions for the farmers to obtain loans. We chose 5 variables to measure, including: X28 (the time spent on the loan), X29 (from the application to get the number of loan negotiations), X30 (other expenses (gifts)), X31 (from the application to the cost of transportation) and X32 (the number of the loan to the paragraph in recent two years).

### 3. Evidence-based analysis

According to the survey data, the analysis results of Tobit model by using Eviews software are shown in Table 1. The model goodness of fit test was AIC=2.957227, SC=3.235391, HQC=3.066378.

\* 10% confidence level significant, \*\* 1% confidence level significant

From the statistical results, we can see that the characteristics of the transaction costs have a significant impact on 12 variables. There are 1 variables in the human capital specificity, namely, the household education level (X1), the physical assets of 3 significant variables, respectively, with the production of fixed assets value (X12), with the value (X13), the end of the housing value (X14); and the value of livestock is the reverse impact on the size of the loan fund. There are 1 significant variables, namely, the distance from the nearest financial institution to the nearest financial institution, and there are 5 variables in the uncertainty of the loan. There are 4 variables are positive effect: whether warranty or guarantee (X20), mortgage (X21), borrowing the term (X25), interest rate level (X26), and loan purpose has reverse effects on the size of the farmers loan funds. Trading frequency of 2 significant variables, respectively, the time spent on the loan X28 and the loan number of recent two years X32.

### 4. Conclusions and suggestions

In order to obtain a more massive loan from formal financial institutions in rural areas, farmers can start from the following aspects:

(1) Improve the cultural quality of farmers. In view of the situation that the farmers' overall education level is not high, we can strengthen the training of farmers' culture and technology. To increase the financial services in the rural, countries also need to introduce a number of financial supports for farmers tilt policy.

(2) Increase the popularity of rural financial institutions network. The scale of the loan affects the distance between the farmers and the financial institutions. Increasing financial institutions distribution and reducing the peasant household financial services of geographic distance, is an effective way to get more loans for farmers.

(3) The mortgage guarantees way of innovation. With the actual innovation of land contract rights, homestead, Forest ownership and other mortgage way, is an important way to ease the demand for household loans.

(4) Encourage farmers to actively use the rural financial institutions to ease their own lack of capital in the production and life. The state should vigorously introduce various financial policies to support the development of farmers, if the threshold of financial policies to reduce, more farmers can obtain loans from financial institutions.

Table 1. Statistics results of the survey data

Independent Variable	Parameter Estimation	Sample standard deviation of parameter estimation	Z statistics	Significant level
X1*	0.122118	0.054154	2.255005	0.0241
X2	0.001157	0.005173	0.223707	0.823
X3	0.171593	0.106819	1.606386	0.1082
X4	-0.007761	0.056119	-0.138291	0.89
X5	0.029807	0.048256	0.617679	0.5368
X6	0.155095	0.154017	1.006999	0.3139
X7	-0.063924	0.044225	-1.445431	0.1483
X8	0.050215	0.062265	0.806471	0.42
X9	0.160895	0.317863	0.506176	0.6127
X10	0.044156	0.048501	0.910403	0.3626
X11	-0.075577	0.095503	-0.791359	0.4287
X12**	0.130676	0.048658	2.685616	0.0072
X13**	-0.150162	0.052439	-2.863533	0.0042
X14*	0.088629	0.052566	1.686069	0.0918
X15*	0.03421	0.017148	1.995007	0.046
X16	-0.00852	0.014957	-0.569617	0.5689
X17	-1.99E-05	0.001395	-0.014265	0.9886
X18	-0.001148	0.00291	-0.394535	0.6932
X19	-0.106008	0.129468	-0.818796	0.4129
X20**	0.317544	0.114542	2.772299	0.0056
X21**	-0.248079	0.053998	-4.594185	0
X22	-0.141515	0.115286	-1.227512	0.2196
X23	-0.054558	0.112668	-0.484233	0.6282
X24	-0.028445	0.156418	-0.181851	0.8557
X25**	0.577571	0.060216	9.591595	0
X26**	0.382626	0.049475	7.733653	0
X27*	-0.012814	0.007128	-1.797762	0.0722
X28**	0.24063	0.052478	4.585396	0
X29	0.009228	0.052835	0.174667	0.8613
X30	-0.013503	0.041716	-0.323682	0.7462
X31	0.032127	0.034226	0.938679	0.3479
X32**	0.25198	0.061561	4.093159	0

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