

# Research on Factors Affecting the Demand of Rural Financial Service in Fujian Province

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**Abstract**—Starting from the factors affecting demand of financial services in rural areas of Fujian province, this paper uses stepwise regression method to select factors affecting demand of financial services in rural areas, and then establishes multiple linear regression model through test data to verify the relationship between them. The test results indicate that the factors affecting rural financial services consumption expenditure are initial material capital, prices of output product and inputs, margin, and other related financial transaction costs. According to research conclusion, the paper puts forward some suggestions to promote and meet the development of rural financial service demand from three aspects: government departments, financial institutions and rural residents.

**Keywords**—Rural finance; Financial service demand; Influence factors; Stepwise regression method

## I. INTRODUCTION

Since the reform and opening up, China's economic transformation has led the economic development of rural areas, greatly stimulated the demand for financial services in rural areas, and accelerated the evolution of the rural financial system. Now, the rural financial system becomes a coexistence pattern by formal financial institutions such as rural credit cooperatives and informal financial institutions such as underground banks and other forms. However, China rural financial service system still has many problems, the problems of "three agricultural" loans, innovation behind and traditional business are prominent, gaps between urban and rural areas still exist. Finance is the core of economic development. "Three agricultural" development needs the support of rural financial. But there are still obvious deficiencies of current rural financial system in Fujian province. The related services provided by financial institutions in rural areas unable to effectively satisfy the agriculture, rural areas and farmers demand for financial services. Against this background, study on influence factors of rural financial service demand in Fujian province, which is of great theoretical and practical significance to improve the level of financial services in rural areas, improve the rural financial markets and deepen reform of rural financial system.

Rural financial problems existed early. Although literature of this issue is not a few, on the whole, most of the literature from the perspective of financial supply and policy makers, and few discussion based on the perspective of financial demand.

Market analysis is based on demand analysis. Rural financial institutions should design financial products and services that meet the needs of farmers according to the characteristics of rural financial demand and the influencing factors. These problems are of practical significance to improve the efficiency of rural financial services in Fujian province. The innovation of this article is based on the existing research results at home and abroad, starting from the influence factors of rural financial service demand, using stepwise regression method to choose the factors that influence the rural financial service demand and through the test data to establish a multiple linear regression model to verify the influence of the relationship between them. Finally, putting forward appropriate constructive suggestions according to results of empirical analysis, hope that developing a broader space for researching financial services in rural areas of Fujian province of China.

## II. EMPIRICAL PROCESS

### A. Variable Description and Data Selection

This paper argues that the effective demand for financial services should meet three conditions: a period of time (this article is set to one year); There is demand for financial services (which means the expected benefit of using financial service is greater than the cost); Consumers are willing and able to pay the cost (assuming that there is no default). The influencing factors of rural financial service demand analysis essence is research of the relationship between benefit and cost. The benefit produced of using rural financial service has been confirmed by a large number of empirical and theoretical researches, the key to research demand of rural financial service is the related costs, that is the cost consumers willing and able to pay. This paper learn thought of Zhang Huiru (2008), assuming factors that affect the demand for financial services are the initial material capital owned by rural residents, income, the prices of outputs and inputs, the deposit and lending rates and related transaction cost.

There are many factors that affect rural financial service demand, such as the family per capita net income, fixed assets ownership, prices of agricultural production and inputs, interest rates on deposit and loan of financial institutions, etc. This article takes these factors as explanatory variables, and takes the consumption expenditure of financial services for rural residents in Fujian province as the dependent variable to

establish regression model. There are some other possible influencing factors are not taken into account, such as financial transaction costs, residents' level of education, etc., we can't get it due to the limitations of statistical data, this article analyzes the factors of data that can be obtained only. The influence of different factors is analyzed from the perspective of credit demand.

Fixed assets for production as the initial material capital can be regarded as a symbol of household wealth. The more farmers have it, the more wealth they have as collateral, and their demand for loans is stronger, vice versa. So the relationship between them is positively. This factor is represented by the variable symbol X1.

The higher the price of agricultural products, the more income the seller can obtain, operating costs unvarying, the service efficiency of funds is rose, which will reduce the demand for credit. But on the other hand, the increase income the rising of the price of agricultural brought about will make the financial service users to enhance the strength to bear the cost of financial services, thus increasing the demand for credit. Therefore, the relationship between them is difficult to determine. The factor is expressed by X2.

In the scale of production of certain circumstances, agricultural production materials price rise will increase the

cost of production, the more money the farmers need, the greater the demand for credit. But on the other hand, the price of the inputs rise will reduce their net income, thereby weakening the financial service users' strength to bear the cost of financial services, and reduce the demand for credit. Therefore, the relationship between them is difficult to determine. The factor is expressed by X3.

Loan interest rates and other related financial transaction cost higher, the higher the amount of fees, when the income certainly, farmers' strength which bear the cost will be reduced, thus reducing the demand for credit. Therefore, financial service demand and related financial transaction costs is negative correlation. Deposit interest rates may also affect the demand for financial services, considering there is a big relationship between deposit rate and loan rate, using both spreads as explained variable, which is expressed by X4.

Net income of rural residents' family increases means that disposable income increases, disposable income increases will increase the demand for financial products and services, so the relationship between income and financial services demand is positive. The factor is expressed by X5.

In conclusion, variable definitions are shown as table I.

TABLE I. VARIABLE DEFINITION OF INFLUENCE FACTORS ANALYSIS

Variable Symbol	Variable Definition	Economic Attribute of Variables	Theory Judgment
X <sub>1</sub>	The average peasant family main production with fixed assets ownership(yuan)	The initial physical capital	Positive correlation
X <sub>2</sub>	Producer price index of agricultural products(In 1999, for base)	Output price	To be determined
X <sub>3</sub>	Price indices of means of agricultural production(In 1999, for base)	Inputs price	To be determined
X <sub>4</sub>	The one-year deposit and lending spread (%)	Interest rate	Negative correlation
X <sub>5</sub>	Per capita net income of farmers (yuan)	Inome	Positive correlation

**B. Stepwise Regression Method to Verify the Relationship between Variables**

Stepwise regression method can determine which factor will have a significant impact on demand, and then eliminate variable that effect is not significant. The method can be divided into several kinds, and backward stepwise regression method is adopted in this paper. It puts all factors that may affect the dependent variable be one-time introduced to establish a regression equation, one by one to delete the p value that is greater than  $\alpha_{out}$ . It uses p value criterion to check all variables that are eliminated and puts the p value that is smaller than  $\alpha_{in}$  into a new model repeatedly, until you find the optimal model of the statistic. The regression model is as follow.

$$Y_t = C + \beta_1 * X_{1t} + \beta_2 * X_{2t} + \beta_3 * X_{3t} + \beta_4 * X_{4t} + \beta_5 * X_{5t} + \mu_t \quad (1)$$

In formula (1), Y<sub>t</sub> stands for financial services demand, which is represented by per capita financial service consumption expenditure of rural residents in Fujian province. C is constant. X<sub>it</sub> is explained variable.  $\beta_i$  is estimated parameters of the corresponding variable, said the influence degree and direction of each independent variable on Y.  $\mu_t$  is error term.

This paper uses 2000 to 2014 year data collected from the statistical yearbook of Fujian to analyze the relevant. Model introduced the independent variable is set when the significance level of  $\alpha_{out}$  as 0.05. Eliminate variables the significance level of  $\alpha_{in}$  as 0.10. The regression equation

contains the return of the amount of minimum number 1, other options to the default form. The output is shown as table II.

TABLE II. BACKWARD STEPWISE REGRESSION OUTPUT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1645.192	794.7152	-2.070165	0.0653
X <sub>1</sub>	0.266883	0.045318	5.889131	0.0002
X <sub>2</sub>	-19.30372	5.485043	-3.519337	0.0055
X <sub>3</sub>	11.83397	4.857412	2.436271	0.0351
X <sub>4</sub>	374.6541	202.6142	1.849101	0.0942
R-squared	0.959754	Mean dependent var		509.5333
Adjusted R-squared	0.943656	S.D. dependent var		364.7519
S.E. of regression	86.58075	Akaike info criterion		12.02123
Sum squared resid	74962.26	Schwarz criterion		12.25725
Log likelihood	-85.15925	Hannan-Quinn criter.		12.01872
F-statistic	59.61845	Durbin-Watson stat		2.590587
Prob(F-statistic)	0.000000			
Selection Summary				
Removed X <sub>5</sub>				

As shown in table II, the output is divided into three parts. The most part is the final parameter estimation result of stepwise regression model, which is in turn by significance test variables. They are X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub> and X<sub>4</sub> respectively, namely the average peasant family main production with ownership of fixed assets, agricultural production price index, agricultural production data price index and the one-year deposit and loan spread. X<sub>1</sub> and X<sub>2</sub> are significant at 1%, X<sub>3</sub> and X<sub>4</sub> are significant at 5% and 10% respectively. They have passed the test of significance. The middle is the evaluation results of the model. The decision coefficient (R<sup>2</sup>) value is 0.9598, and the adjusted decision coefficient (AR<sup>2</sup>) value is 0.9437. Both are close to 1, indicating that the fitting degree of the model is very high. F statistics event probability is almost zero, indicating that equation of regression model have passed test of significance. The bottom summary section is a process of variable eliminate. It eliminates only one variable in the regression equation X<sub>5</sub> that is the per capita net income of rural households. According to theoretical analysis, the per capita net income should have a great relationship with financial service demand, but this variable is eliminated among five factors, possible explanation is that the data of the sample size is too small.

The following linear regression equation is obtained from the model estimation results of table II.

$$Y = -1645.19 + 0.27X_1 - 19.30X_2 + 11.83X_3 + 374.65X_4 \quad (2)$$

Look from the equation (2), the more the initial physical capital is, the more consumer spending of financial services is. Embodied in production with the original value of fixed assets increased by 1 yuan, the financial services consumer spending will increase 0.27 yuan. The positive correlation relationship between ownership of fixed assets and financial service demand is consistent with the previous theoretical analysis. Output product prices that agricultural producer price index increased 1%, the financial services consumer spending will be reduced 19.30 yuan. The price of inputs is the index of agricultural production data increased by 1%, the financial services consumer spending will increase 11.83 yuan. Output product prices and input product prices have opposite effect of direction on demand for financial services, but the influence degree is similar. Margin increases 1%, and financial services consumer spending will increase 374.65 yuan, which is contrary to predictions. Constant term of equation is large and negative, which may be that the transaction costs associated with unconsidered financial services play a leading role. The previous theoretical analysis already knew that financial transaction cost and financial service demand are negative correlation, so the constant term is negative. Look from correlation coefficients, fixed assets has the least influence on financial service demand. The prices of output and inputs have great influence on financial service demand and the effects are opposite. The difference between loan and deposit rates has the greatest impact on financial service demand.

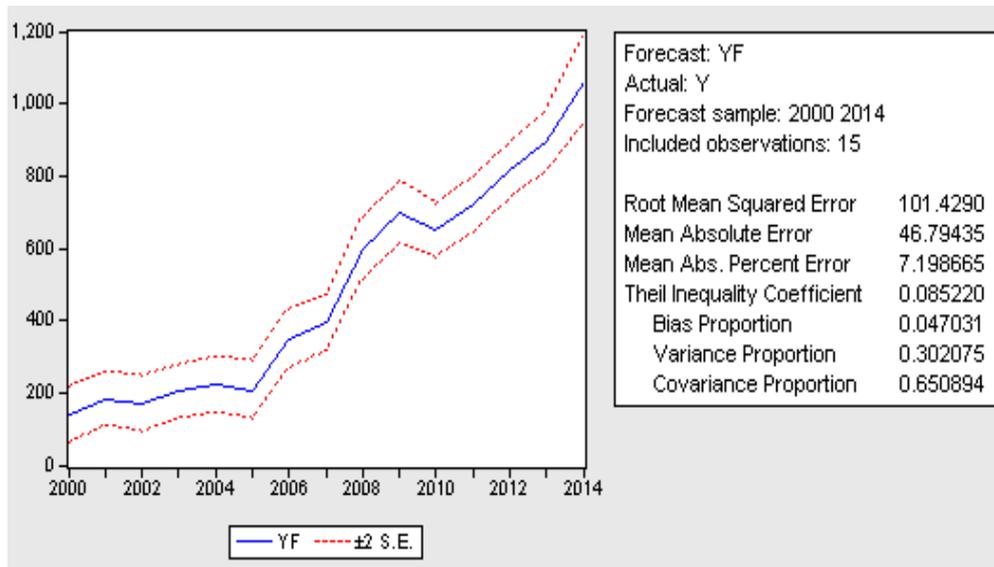


Fig. 1. Model prediction evaluation

In order to test the prediction accuracy of stepwise regression method, the predicted value is shown as fig.1. The predicted value is the dependent variable Y of the regression model, and the two dashed lines represent the double standard error band of the predicted value. The right half is evaluation indicators for this prediction. The value of MAPE is 7.2 and less than 10, indicating that the prediction accuracy of the model is higher.

### C. Empirical Summary

There are many factors that affect rural financial service demand, and the affected process is complex. This paper establishes regression models for quantitative analysis to simplify this process. First, we guessed all factors that may affect financial service needs, and assumed their effect direction. Second, we used stepwise regression method to filter explained variable of optimal subset. Among the factors, average each farmer family main production with fixed assets ownership, agricultural production price index, agricultural production data price index and the one-year deposit and lending spread were followed by through test and left down. But rural family per capita net income was removed. At last, we established multiple linear regression equations by tested data. Results showed that relationship between financial services demand and output prices is negative, relationship with the other three factors are positive, and the degree of each factor are different. Empirical analysis is in-depth development of theory analysis. On one hand, it can verify whether theoretical assumption is consistent with the results or not. Our research results showed that influence of initial material capital on financial services demand is consistent with theoretical analysis, while the relationship between the financial demand and interest rates is contrast to that. On the other hand, under specific environment conditions, empirical analysis can determine uncertainty theoretical analysis, such as output product prices and inputs price to financial demand.

## III. COUNTERMEASURES AND SUGGESTIONS

### A. Angle of Government

High cost of loans has restrained farmers' financial demand, while the for-profit financial institutions cannot provide low-interest loans, which leads to the shortage of rural credit funds. Therefore, it requires government strengthen the refinancing of underdeveloped county agriculture. Government can ease loans interest burden on farmers by extending loan terms, adding categories of loans, introducing agricultural loans low interest rate policy gradually. At the same time, finance, taxation and other departments select rural financial institutions to make financial discount and tax exemption for agricultural loans, so as to encourage credit investment in agriculture, rural areas and farmers.

Substantial part of farmers' loan is for consumer spending. Pensions, health care, education and other issues are one of the causes of farmers' loan, but high risk of financial operations in rural areas increases the difficulty of farmers' loan. Agricultural natural "inferiority" leads to higher rate of insurance claims. Therefore, government should perfect the relevant laws, establish farmers' insurance system, accelerate product innovation to improve the stability of household income and increase financial institutions' willingness to lend. Government needs to pay more attention to agricultural policy insurance business. Attract social funds into agricultural insurance industry through tax offers, subsidies, various policies to encourage insurance institutions to develop insurance products actively and expand agricultural insurance parameter insurance rate constantly. In addition, government needs to speed up rural social security system of perfect speed, expand medical guarantees, minimum life guarantees and basic guarantees mechanism to general rural area gradually. Solve life problem of non-rich farmers and from essentially reduced farmers on consumption sex needs of credit, reduce farmers' demand for consumer credit radically.

### *B. Angle of Financial Institutions*

The difficulty of mortgage and guarantee has been one of main factors to inhibit farmers' financial demand. Previous empirical analysis showed that the more the initial capital is, the more the demand for financial services is. Financial institutions can combine the local characteristic economy and advantageous industries to innovate the guarantee system and way, looking for effective mortgage assets, using movable property that can be pledged, looking for the guarantors, combined with a variety of ways to break through guarantee problem. Meanwhile, according to rural economic needs, developing microcredit and innovative derivatives, absorption of funds in the form of loans from the countryside coming in rural areas, thereby reducing rural fund outflow. Most farmers' credit funds are used for meeting consumer demand. In order to address rural needs effectively, financial institutions should expand the scope of loans based on rural production and consumption characteristic, particularly consumer loans.

Farmers tend to fine extra funds investment tools, in order to get returns than bank deposits. However, their risk tolerance is weak and money is a little, and they have no leisure time and investment knowledge. Financial institutions can design a payment product that starts from low risk and less money to increase investment channels. At the same time, they should personalize service products in accordance with the characteristics and preferences of local rural residents. Promote financial products suitable for rural residents and allow financial planning services to enter rural areas.

### *C. Angle of Rural Residents*

From farmers' point of view, on the one hand, rural residents should be active to learn financial knowledge. They can learn the credit policy of financial institutions, investment, and financial products through television, newspapers, radio and other media. Identify differences between productive loans and consumer loans, and use funds rationally to maximize the service efficiency of funds. On the other hand, they can use learned knowledge to try to accept new things, improve their comprehensive quality and ability, actively carry out the production and business operation activities to promote their own economic ability. Actively cooperate with banks and other financial institutions related policy, be honest and trustworthy to increase financial institutions' willingness to lend to them.

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