

Determinants of Access to Bank Credit for Agricultural Households in Vietnam

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Abstract

This study examines the determinants of access to bank credit for agricultural households in Vietnam. Although there have been many positive developments, there is still a big gap in the economy when agricultural and rural areas are compared with urban areas; many agricultural households are still living in poverty. With the assumption that the improvement of access to capital will help people escape from poverty to become rich, this paper provides evidence of determinants of access to bank credit, as well as the granted amount of credit capital for agricultural households. The data is collected from a survey of 1560 agricultural households , conducted in August 2013. The results show that the level of education of the householder, value of collateral, household income, householder experience and credit history, can affect access to bank credit.

Keywords: Access to bank; agricultural households.

1. Introduction

Vietnam has an area of agricultural land of 9.412 million ha, accounting for 28.4% of the total area. Although agriculture contributes only about 18% of GDP, labor in this sector accounts for 55% of the total labor in the country. In 2013, the value of agricultural exports reached \$20 billion, and continues to be one of the key export sectors. In recent years, the economic structure has had an important influence on the direction of increasing the share of the industry and service sector, and in decreasing the share of the agriculture sector. In comparison, between 2005 and 2012, the structure of the total value of agricultural products dropped from 22% to 18%. In contrast, the share of the service sector increased from 40% in 2005 to 43% in 2012. Similarly, the share of the industry and construction sector increased from 38% to 39% during the same period (Tran Tien Khai, 2013). This suggests that the role of the agricultural sector is increasingly reduced, relative to the services and industry sector. Overall, the rate of change in the structure of total domestic products is quite slow, reflecting the stagnation in the growth of the service and industry sector.

Although the share of the agriculture sector in the economy is decreasing, the role of ensuring livelihoods and creating opportunities for work in this sector is still very important. Due to the decline in the growth of the two areas of industry and service, the ability to absorb the labor force from the rural area is weak, leading to the fact that redundant rural labor, having no opportunity to move to the two areas above, are “blocked” up in the countryside. This is shown by the data in the period of 2005 – 2012 when the structure of the rural population in the

country fell less than 5% (from 72.9% down to 68.06%); while the rural labor force increased from 53.4% to 59.8% (Tran Tien Khai, 2013). The number of rural laborers did not decrease, but increased in contrast. In the context of limited agricultural land, labor pressure on agricultural land increases dramatically, causing a negative impact on the productivity of agricultural labor. Due to the low labor productivity, income per capita in rural areas is still very low, reaching about 12.84 million VND/ person in 2010, about half compared to urban areas.

Despite the importance of creating more work, the agriculture sector has not received adequate attention in terms of capital investment of the whole society as well as investment of the state sector. In 2012, the total investment in the agriculture sector only accounts for less than 5% of the total investment in the country. The proportion of credit outstanding in the agricultural area accounted for 9.6% of total loans in 2012, and about 10% of total loans in 2013 (Tran Tien Khai, 2013). Thus, investments in agriculture are very low and are not commensurate with the socioeconomic role of this sector in the national economy.

In recent years, along with the program of economic restructuring in general, the Government has not stopped promoting the restructuring of the agriculture economy. This has meant the restructuring of crops and livestock, reducing the area of inefficient rice cultivation and switching to other crops, and the management of livestock with greater economic efficiency, adopting suitable characteristics of modern agriculture. For the success of agricultural economic restructuring, one of the most important issues to be addressed is the problem of capital,

including bank credit for agricultural households.

The nature of agricultural production is highly seasonal, the income often falling a certain number of times, while capital demand for consumption and production are often spread over a year. Therefore, improving access to credit capital is seen as an important tool to regulate the income flow and expenditure flow, thereby contributing to improving production efficiency. There is much evidence, for example in the study of Armendariz and Morduch (2005), showing that credit has a positive impact on health and education expenditure; in turn, the impact of these factors increases the capacity and efficiency of production. The success of credit programs depends largely on the ability of access to capital for poor households. This depends on the relationship between the supply and demand of agricultural credit. Supply of credit depends on the policies of credit norm of the funding organizations, while credit demand depends on the decisions of whether the households borrow capital or not, and if they do, how much capital they would borrow.

In terms of access to bank credit, agricultural households are classified into the following groups: (i) The first group includes households having the intention to borrow capital from a bank but then they decide not to borrow due to a number of barriers, such as: high interest rates, complex loan procedures, and unsuitable credit products for their needs; (ii) The second group consists of households that have completed procedures for a bank loan but have been refused a loan for not meeting the loan conditions; (iii) The third group consists of households that have been granted credit capital, but

the accepted amount of capital was lower than their demand for a loan; (iv) The fourth group includes households granted credit capital equal to their loan needs. This study focuses on analyzing the determinants of access to bank credit for agricultural households for group (ii), (iii) and (iv) and we define agricultural households that have access to sufficient credit as the households of group (iv). The remainder are households that do not have access to sufficient credit.

The paper is structured as follows: The next section summarizes the relevant studies. Section 3 introduces the model and methodology. Section 4 presents data and describes the variables. Section 5 is the result of study and discussion. Section 6 gives conclusions and policy recommendations.

2. Review of previous studies

Nearly all studies examining the accessibility of credit capital for agricultural households are concentrated on answering two key questions. The first question is, what factors affect the ability of agricultural households to be granted credit from a bank? The second is, what factors affect the amount of granted credit? In these studies Probit or Logit models are often used to answer questions 1 and Tobit model is often used to answer question 2 (Tran Tho Dat, 1998; Abi Kedir, 2002). In some cases, a model selecting 2 steps of Heckman is used to simultaneously answer questions 1 and 2 (Vuong Quoc Duy et al., 2012).

In developing countries, the situation of asymmetric information between lenders and borrowers is fairly common. Therefore, collateral is considered an important factor affecting the borrowing ability of the borrowers. In

addition, the elements of education, status of the householder, area of cultivated land, and household income, also play an important role in the ability to access the capital of agricultural households (Robert Lensink et al., 2008). In the study of Pham Thi Thu Tra and Robert Lensink (2007), credit capital granted to borrowers in Vietnam depends on the effective use of capital, as well as collateral, guarantees and capital purposes. Vuong Quoc Duy et al. (2012) use the Heckman model to assess the impact of the factors on the ability to access credit capital of agricultural households in the area of the Mekong River delta. The results show that the access to credit capital of agricultural households has a positive relationship with variations in the value of the house, and whether or not the householder is a male; and in the opposite direction according to household scale, distance from home to the center of the town, and the area of cultivated land. The study results of Takahashi (2010) in Indonesia show that access to credit is strongly influenced by the level of household wealth, but less dependent on collateral. Abi Kedir (2002) used a Probit model to evaluate the influence of the factors on the ability to access credit for agricultural households in Ethiopia, and shows that the total variable of expenditure, value of guarantee property, and education level of the householder, all affected the increased access to credit. In contrast, the dependent variable in the family, and the total current debt, contributed to reduce the ability of access to credit. The variable of household scale, age of the householder, and gender of the householder had no statistical significance.

Although there are certain differences, most results from the study show that the ability

to access credit for agricultural households is affected by factors such as age, education, income, social status, collateral and social and demographic characteristics. The rest of this study analyzes the way that the above factors affect access to bank credit of agricultural households in Vietnam.

3. Study model

Model 1

To answer the question, "What factors affect the ability of agricultural households to be granted credit in the area of Vietnam?", this study uses a Logit regression model. The dependent variable is written as follows:

$$y_i^* = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* = 0 \end{cases}$$

In which, the variable y_i^* denotes the amount of credit granted by banks to households. This capital is a function of the explanatory variables (X_i) and is given by the equation:

$$y_i^* = \beta_0 + \sum \beta_j X_{ij} + \varepsilon_i \quad (j = 1, k) \quad (1)$$

The Logit model is dependent on the logistic distribution assumption of random error in equation (1). Hosmer and Lemeshow (1989) point out that, the Logit model has advantages over other models due to its flexibility and ease of performing in a mathematical aspect as well as the results being fully explained.

The function of cumulative logistic probability is expressed as follows:

$$P_i = F(Z) = F(\alpha + \sum \beta_j X_{ij}) = 1/(1+e^{-Z}) \quad (i = 1, n) \quad (2)$$

In which, P_i is the probability of household granted credit, reviewed in terms of household characteristics and production characteristics X_i ; α and β are the coefficients needed to be estimated.

To explain the significance of the estimated coefficients, the Logit model should be expressed in terms of the possibilities and the log of the possibility. The ratio of possibilities implies the probability (P_i) that an incident (household granted credit) occurring on the probability ($1 - P_i$) that the incident does not happen. After some simple algorithms, equation 2 can be rewritten as follows:

$$(1 - P_i) = 1/(1+e^{z_i})$$

Therefore:

$$P_i/(1-P_i) = (1 + e^{z_i})/(1 + e^{-z_i}) = e^{z_i}$$

Taking the natural base of the logarithm of the two sides in the above equation, we obtain the following Logit model:

$$Z_i = \ln(P_i/(1-P_i)) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \quad (3)$$

After accounting for the error in the estimates of possibilities, equation (3) becomes:

$$Z_i = \ln(P_i/(1-P_i)) = \alpha + \sum \beta_i X_i + \varepsilon_i \quad (4)$$

The coefficient of the Logit model, therefore, reflects the log of the ratio of possibilities (granted credit and not granted credit) due to changes in the explanatory variables.

Model 2

To answer the question, "What factors affect the amount of granted credit?", the study continues to use the data as used in model 1. In the investigated statistical sample, there is a significant proportion of agricultural households not borrowing capital from banks, so we do not have data of the dependent variable for these household. In other words, we encounter a form of censored sample. To handle the data to answer the study question, the author applies a Tobit model. The model is written as follows:

$$y_i^* = \alpha_i + \beta_i X_i + \varepsilon_i$$

$$y_i = \begin{cases} y_i^* & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases} \quad (5)$$

In which:

y_i^* is the dependent variable, indicating the amount of credit granted in the regression equation

y_i is the amount of credit granted to households observed from the study sample

α_i is the intercept coefficient of the equation

X_i is a vector of explanatory variables

β_i is the vector of estimated coefficients

ε_i is the random error

To estimate the parameters of the Tobit model, the author uses the method of maximum likelihood with the help of software Eviews.

4. Data and description of variables

4.1. Data

The study uses data sources supplied by the author investigating 1560 agricultural households in the province of Thai Binh, Quang Tri, Dong Nai and Long An in August, 2013. One district is randomly selected in each province where a survey of 390 agricultural households is conducted. The data contains the characteristics of agricultural households, characteristics of loans, credit behavior of agricultural households and other characteristics.

The agricultural households are randomly selected to be directly interviewed at the residence of the households. The survey is conducted with the help of the students of the Banking University of Ho Chi Minh City.

Table 1 provides an overview of the status of the bank loans of the agricultural households. In total of the 1560 households surveyed, 520

Table 1: Status of bank loans

Bank loans	Quantity	Percentage (%)
No loans	520	33.33
Loans	1040	66.67
Total	1560	100

Source: Investigation by the author, 2013

households answered they have no bank loans, accounting for 33.33%; there are 1040 households that respond to have borrowed from a bank, accounting for 66.67%. The percentage of those borrowing from bank, as above, is quite high compared to some surveys in other studies.

Table 2 provides information on the credit characteristics of agricultural households. The average value of a loan is 88.7 million Vietnam dong, the average interest rate of the loan is 0.9% per month. The average transaction costs of one loan (including the cost of records, transportation expenses, etc) is 560.5 thousand Vietnam dong. The average duration of the loan is 21.85 months.

Table 3 provides statistical information for the variables. According to the data in Table 3, the average land area of agricultural households is 4736m², the value of positive skewness

and kurtosis of 3.52 implies that the land distribution of agricultural households area misses to the right. The average income per household is 185.98 million Vietnam dong/year. A relatively high standard deviation of income shows a quite large degree of dispersion of income. The value skewness of income is positive and kurtosis of 5.65 implies that the income distribution of agricultural households area misses to the right. The average age of the householder is 41.23 years, the high standard deviation implies a high level of dispersion of the age of the householder. The positive skewness value indicates the distribution of the age of the householder misses to the right. The average number of years of education of the householder is 10.23 years, the negative skewness shows that the distribution of educational variable misses to the left.

Table 3 also shows that 41% of the house-

Table 2: Statistic of credit characteristics (average)

Loan scale (million Vietnam dong)	Loan interest rate (%/month)	Transaction costs (thousand Vietnam dong)	Loan term (months)
88.70	0.90	560.50	21.85

Source: Investigation by the author, 2013

Table 3: Statistic of variable description

Name of the variable	Average	Standard deviation	Skewness	Kurtosis
Land-size	47.36	22.70	1.03	3.52
Income	185.98	73.17	1.30	5.65
Age	41.23	10.54	0.29	2.30
Education	10.25	2.30	-0.35	2.18
Gender	0.41	0.49	0.36	1.13
Position	0.27	0.48	0.50	1.25
Dependents	2.12	1.00	0.04	2.69
Credit-history	0.39	0.49	0.41	1.17
Collateral	288.55	167.57	1.23	4.55
Informal	0.41	0.49	0.36	1.13

Source: Results extracted from Eviews

holder are female, 37% of the householders are persons who have maintained a political-social position in the locality, 39% of the households have never had a bank loan, and 41% of the households borrow in the informal market. All variables in this group of dummy variables have positive skewness values.

The average number of dependents per household is 2.12 people. The average collateral value of each household is 288.55 million Vietnam dong, the standard deviation of this variable is 167.57, shows a large dispersion. Positive skewness value and kurtosis of 4.55 implies that the distribution of this variable misses to the right.

4.2. Description of variables and expected sign

Land-size: This variable represents the total area of land ownership of the household, including living land and arable land, and is measured in units of 100 m². Households owning more land must be considered to have a higher repayment capacity. Thus, the expected sign of

the variable of “land-size” in both models is the sign +.

Income: This variable represents the average income of a household in a year, calculated in units of million Vietnam dong. The higher the income, the higher the repayment capacity. However, when the household has a high income, their demand for a loan is lower because they have the ability to cover expenses. Thus, the expected sign of this variable in both models is +/-.

Age: The age of the householder. The higher the age of the householder, the better the ability to control resources, and the greater reputation and responsibility becomes. Therefore, such households have easier access to formal credit sources. Meanwhile, young householders often spend more than they save, but they have the ability to grasp technology and techniques more quickly, and are willing to take higher risks. This means a higher demand for credit. However, young householders often find it more difficult to access bank credit because they have less experience and reputation. This

Table 4: Description of variables and expected sign

Name of the variable	Description of variables	Unit	Expected sign	
			Model 1	Model 2
Land-size	Area of ownership land	100 m ²	+	+
Income	Annual household income	Million VND	+/-	+/-
Age	Age of householder	Years	+/-	+/-
Education	No of school years (education level) of householder	Years	+	+
Gender	Gender of householder	Female = 1	+/-	+/-
Position	Status of householder	Yes = 1	+	+
Dependents	Number of dependent people	Amount of people	+/-	+/-
Credit-history	Credit History	Yes = 1	+	+
Collateral	Collateral value	Million VND	+	+
Informal	Borrowing in the informal market	Yes = 1	-	-

Source: Investigation by the author; 2013

leads to a lower ability to access credit than older people. The expected sign of this variable in both models is +/- .

Education: Represents the school years (education level) of the householder. Those who go to school for more years are often able to exploit better investment opportunities as well as better understand the loan procedure, so they tend to use credit loans from banks. This variable has the expected sign of + in both models.

Gender: This is a dummy variable, taking a value of 1 if the householder is female, and a value of 0 if the householder is male. This variable has the expected sign of +/- in 2 models.

Position: Status of the householder. This is a dummy variable, taking a value of 1 if the householder assumes a political-social position in any society organizations (such as the Association of Farmers, Association of War Veterans, Association of Women, Association of Youth, Vietnam Fatherland Front, Communist Party, etc), or a government agency (such as the People's Committee of communes, wards,

team, etc); and taking a value of 0 if the householder does not undertake any political-social position. Those who have a political - social position typically capture information faster and are more reputable. Therefore, they are considered to be capable of a higher access to credit. This variable has the expected sign of + in both models.

Dependents: The variable represents the number of dependents in the household, including those under 18 or over 60, and those of working age but still in school. This variable has the expected sign of +/- in 2 models.

Credit-history: This variable of credit history shows whether the households have ever had bank loans before getting the existing loan or not. This variable takes the value of 1 if the interviewed household answered "Yes", and the value of 0 if the household answered "No". This variable has the expected sign of +.

Collateral: The collateral value of assets is calculated in units of millions of Vietnam dong. The majority of credit granted from the bank is

to the agricultural households that have mortgages. For those without bank loans, the variable of “collateral” is estimated by an asset with the most significant value that the agricultural households own and can be used as collateral (assets with clear legality, have market value and liquidity). For households that do not own any significant assets as collateral, this variable takes a value of 0. In both models, this variable has the expected sign of +.

Informal: The variable of informal loans represents whether the households borrow from other sources, in addition to the formal credit institutions or not. This is a dummy variable, taking a value of 1 if the household has borrowed from other sources, and a value of 0 if the household has not borrowed from other sources. In models 1 and 2, this variable has the expected sign of -.

5. Empirical results and discussion

The estimation results from the two models in Table 5 show that the coefficients are marked as were the initial expectations.

The area variable has a statistical significance in both models. This implies that the area of ownership of land of the household is a factor to be considered in the process for the bank to decide whether to grant credit or not, and if granted, what the value is. In addition, these results provide further evidence that households having larger acreages often have large capital needs for expansion or restructuring of production.

The income variable has a statistical significance in model 1, but no statistical significance in model 2. The coefficient is positive in model 1 and shows that, as income increases, the ability to borrow from banks becomes larger.

However, the results from the Tobit model shows no relationship existing between income and the amount of granted credit.

The age variable of the householder has a statistical significance in both models. This can be interpreted as older householders have easier access to bank credit than young householders because they have more experience and higher reputations; although young people may have a higher demand for credit. This implies that the impact of reputation and experience is greater than the impact of capital requirements, considered separately as a consequence of age, to the ability of households to be granted credit as well as the amount of granted credit.

The education variable of the householder has a statistical significance in 2 models and the impact degree of this variable on the dependent variable is quite large. As discussed in the previous section, those who have received a better education often capture better business opportunities, and therefore their credit need is higher. Additionally, these people usually understand the procedures and conditions for bank loans and they can better meet those conditions. This helps to increase the chances of getting bank credit as well as the amount of credit granted. This result is similar to findings in other studies (Robert Lensink et al., 2008; Pham Thi Thu Tra and Robert Lensink, 2007)

The gender variable of the householder has no statistical significance in both models. This provides evidence that there is no discrimination based on the gender of the lender.

Like the gender variable, the variable of status of the householder has no statistical significance in both models. This is surprising when compared with the results of other studies

Table 5: Empirical results

Name of the variable	Model 1 (Logit)		Model 2 (Tobit)	
	Coefficient	Statistics z	Coefficient	Statistics t
Land-size	0.05	2.25 *	1.04	2.19 *
Income	0.02	4.08 *	0.02	0.39
Age	0.08	2.25 *	0.94	2.16 *
Education	0.70	4.15 *	10.11	5.14 *
Gender	-0.01	-0.01	-10.26	-1.30
Position	0.42	0.31	3.34	0.39
Dependents	-0.24	-0.68	2.11	0.46
Credit-history	1.33	1.99 *	12.8	1.60
Collareral	1.11	2.24 *	1.32	10.8 *
Informal	-0.85	-1.34	-10.14	-1.23

Pseudo R² = 0.58

LR statistic = 115.53

Prob (LR statistic) = 0.00

Log likelihood = -41.53

*Note: The asterisk * represents statistical significance at 1%*

Source: Results extracted from Eviews

(Pham Thi Thu Tra and Robert Lensink, 2007) showing the status has a certain influence on the ability to access capital. However, this result can be explained. In Vietnam, those who work in agriculture, but take on one more political-social position may have other relatively stable sources of income, in addition to income from the agriculture economy. Therefore, they do not tend to focus on production and there is not much demand for bank loans.

The dependent variable has no statistical significance in both models. The credit needs of families having many dependents aim to finance the expansion of production and consumption, such as to cover the expenses of their children going to college. In contrast, the credit needs of a household with few dependents, typically young households, often aim to cover expenses such as building a new home. The study results shows no differences in access to capital among household having many and few

dependents.

The variable of credit history has a statistical significance in model 1, and has a large impact on the ability of households to be granted credit. This result implies that, in the context of existing asymmetry information, the information of credit history has provided an important basis for the bank to decide to grant credit. Therefore, for those households that have ever had bank loans and have a good repayment history, the ability to be granted credit is very high. However, the variable of credit history has no statistical significance in model 2. This implies that the amount of granted credit depends on many other factors, rather than depending on the repayment history of the borrower.

The variable of collateral value has statistical significance in 2 models and has a relatively strong influence on the ability of households to be granted credit as well as the amount of granted credit. This stems from the fact that banks

often lack information on agricultural customers in credit analysis. So, one of the measures to mitigate the credit risk is the requirement of mortgage of loans. These results are similar to those findings in previous studies in other areas in Vietnam (Vuong Quoc Duy et al., 2012).

The loan variable in the informal credit market (as from relatives, friends, from the personal lender or from groups, etc.) has no statistical significance in both models. This result implies that the majority of agricultural households decided to borrow from a bank before borrowing from informal markets. Therefore, these factors do not affect the ability of households to be granted credit and the amount of granted credit from a bank.

6. Conclusions and recommendations

Through Logit and Tobit models, this study provides evidence on the factors that affect access to bank credit for agricultural households in Vietnam. The factors affecting the ability of access for households to be granted credit are: land area of the household, household income, age of householder, education level of householder, credit history and collateral value. The factors that affect the amount of credit granted are: land area of the household, age of householder, education level of householder and collateral value. In both models, the factors having the most influence on the ability of households to access capital are the education level of the householder and collateral value. Through the findings above, this article gives some recommendations to improve the access to bank credit for agricultural households in Vietnam as follows:

Firstly, the government should continue to accelerate the process of issuing certificates

of land use right and housing ownership for agricultural households. Currently, there are still about 15% of agricultural households that have not been issued a certificate of land use right and housing ownership (Le Thanh Ngoc, 2014). The issue of the certificate of land use right and housing ownership will contribute to increasing the assets with mortgages in the bank, thereby, improving access to credit for agricultural households.

Secondly, continue the implementation of mechanisms and policies to facilitate and encourage the children of agricultural households to go to school. This will have a lasting positive impact on increasing the working capacity of agricultural households, thereby increasing access to capital. The policies of encouraging education may include fiscal policies such as: credit programs with preferential interest rates for the purpose of study encouragement, the establishment of a scholarship fund for children of poor households but who have good academic results, etc; and non-financial policies such as: the establishment of special buses to shuttle the children of remote areas to school, ensuring the majority of agricultural children have access to school in a convenient way.

Thirdly, the commercial banks in the area must build and organize a number of programs of training, giving selective free advice for agricultural households on skills of agricultural production and management, skills of accounting of financial revenue and expenditure in agriculture production. This on the one hand helps agricultural households to manage more effectively their resources. On the other hand, this facilitates the enhancement of a two-way exchange of information between banks and

agricultural households, thereby providing a channel of useful information to help banks to have a better basis for evaluating customers, reducing dependence on information from Credit

Information Center (State Bank of Vietnam) as well as reducing dependence on collateral factors contributing to further improve the access to credit of agricultural households.

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