

DETERMINANTS OF FARMING HOUSEHOLDS' ACCESS TO FORMAL CREDIT IN  
THE MEKONG DELTA, VIETNAM

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Abstract: Rural credit markets have developed for a long time. However, farming households' access to credit is still relatively limited. The literature is still unclear about the reasons for this lack of access. This paper contributes to the literature on rural credit markets by developing a new dataset on households' access to formal credit in the Mekong Delta in Vietnam. By applying the Heckman two-step model, the paper suggests that the probability of using formal credit increases if borrowers pledge their land use rights, if borrowers are younger, and if the households head is a male. It also appears that the probability of using formal credit declines if borrowers use informal credit. The paper also suggests that the size of the formal loan is higher for borrowers who pledge collateral, borrowers who are more educated, borrowers who have more land, and if the loan is used for non-production expenses.

Key words: access to formal credit institutions, farming household, Mekong Delta, Heckman two-step model.

## **1. Introduction**

The literature on rural credit markets in developing countries suggests that the structure of the financial system in developing countries differs substantially from that in developed economies (Agénor and Montiel, 1999, p. 189). In developing countries, formal credit markets often do not function well, and consequently access to formal credit is limited, while the informal financial sector flourishes and serves many clients. The main reason is that asymmetric information between formal financiers and those who need financing may lead to adverse selection and moral hazard problems (Stiglitz and Weiss, 1981). Adverse selection and moral hazard may explain why banks ration credit, since a rise in the interest rate may lead to more excessive risk taking by borrowers (moral hazard) and a worsening of the pool of applicants (adverse selection). More in general, before granting a loan, formal lenders usually collect information about the creditworthiness of borrowers. However, due to imperfect markets and asymmetric information, formal lenders are not fully able to evaluate the creditworthiness and loan use of borrowers (Vu, 2001).

The extent of credit rationing may be reduced if borrowers pledge collateral. However, this solution assumes that collateral is available, which is often not the case in developing countries, especially in rural areas. Moreover, even in case a borrower is able to put up collateral, he/she may still be credit rationed. The reason is that a lender may be unable to seize the collateral in case of default due to deficiencies in the regulatory system.

If credit rationing is prevalent, farming households cannot borrow as much as they wish or may even be denied access to formal credit. Therefore, very often farming households have to rely on informal credit markets to finance their investment (Ray, 1998). The literature on credit markets in developing countries suggests that informal lenders are better able to take advantage of information flows within villages. They clearly know the creditworthiness of borrowers. Due to a close relationship and close distance to the borrowers, informal lenders have better information about the ability of borrowers to repay and how borrowers used the loan (Floro et al., 1991). Thus the cost of collecting information is lower in the informal credit sector and, therefore, informal lenders may have an advantage in lending to small borrowers. However, it is also often argued that informal lenders charge very high interest rates, which increase investment costs if investments are financed by informal credit.

In order to improve access to formal rural credit, in many developing countries governments develop formal financial institutions that lend against relatively low interest

rates. This is also the case in Vietnam, the country on which this paper focuses. The formal credit sector in Vietnam is characterized by the dominance of state-owned commercial banks with a lending share of 73.5 per cent. (World Bank 2002). State-owned commercial banks used to primarily serve the state-owned enterprises, but have recently initiated a credit shift to the private sector, especially SMEs (small to medium enterprises) and households. Especially for rural households, state-owned commercial banks are important providers of rural credit. Well-known examples are the Bank for Agriculture and Rural Development (VBARD), the People Credit Funds and Rural Shareholding Banks. Especially, the VBARD is important. This bank supplied credit to about 33 percent of rural households in 1998 (Dao V.H, 1999). Nevertheless, only a small part of the farming households have access to formal credit (Tran, 1998).

At the macro level, the lack of access to formal credit implies a loss in national output, because productive opportunities are not being utilized by a properly functioning credit market. Also at the household level a shortage of formal credit may have disastrous effects. Most farming households need formal credit in order to finance necessary production inputs, such as land, seeds and fertilizers. In addition, formal credit is important since it may reduce the vulnerability due to illness, drought and crop failures, and it can contribute to a better education, health and housing of the borrower (Ray, 1998). Thus, an increase in access to formal credit is of utmost importance.

There are several empirical papers on credit markets in developing countries that have tried to determine which factors determine household's access to formal rural credit. This literature e.g. shows that in many developing countries trust becomes a very important determinant of access to formal credit since poverty limits the use of collateral. Therefore, credit contracts in rural credit markets often contain personal characteristics, such as education and reputation of farming household heads. In addition, observable characteristics like land size, household income and assets are often important determinants of access to formal credit. However, determinants of access to formal rural credit seem to be country specific, so that generalizations are difficult to make. For this reason, country specific studies on access to formal credit are important.

This paper contributes to the empirical literature on access to formal rural credit in developing countries. The aim is to examine which factors determine access to formal credit of farming households in the Mekong Delta in Vietnam. The analysis is done in two steps. First, we explore why some farming households have access to formal credit, whereas other farming households are denied formal credit. Second, for the group of farming households

who do have access to formal rural credit, we examine the determinants of the loan size that can be obtained. The analysis is carried out by estimating a Heckman two step model. A special feature of the paper is that we use a newly developed dataset, based on a survey in 8 communes of 4 districts of 4 provinces in the Mekong Delta region in October 2005. In total, the survey resulted in 240 observations.

The remainder of this paper is organized as follows. Section 2 presents an overall picture of the rural credit market in Vietnam. Section 3 surveys some relevant empirical studies on access to formal credit in Vietnam. Section 4 develops a theoretical framework that will be used to formulate the econometric model. This section also discusses some variables that may be important in explaining access to formal rural credit. Section 5 surveys the data sources used in this study, and presents sampling characteristics. It includes an overview of the sample size, and presents credit characteristics. Section 6 applies the Heckman two-step model to examine the main determinants of the use of formal credit, as well as the main determinants for the size of formal loans. Section 7 summarizes the main results and provides some recommendations for policy makers.

## **2 The formal credit market in Vietnam<sup>1</sup>**

This subsection provides an overall picture of the formal financial system in Vietnam. Formal credit institutions are financial intermediaries that operate ‘not only to the general laws and regulations but also to specific banking regulation and supervision’ (Ledgerwood, 1999). It includes banks, non-bank financial institutions and other credit programs of government and NGOs.

Before 1988, the banking system in Vietnam only comprised the State Bank of Vietnam (SBV) and two specialized institutions, namely the Bank for Investment and Development (BID) and the Bank for Foreign Trade (Vietcombank). The system can be characterized by a state monopoly, and widespread subsidies leading to negative real interest rates. This has led to a bank crash (Putzeys, 2002).

Since 1986 a process of economic reforms, a so-called “*doimoi*”, has been implemented in Vietnam. One of the targets of this transformation is to build a strong and efficient financial system that can play an active role in mobilizing and allocating resources. The economic reforms led to a two-level system, consisting of the State Bank of Vietnam

and four state-owned commercial banks (SOCBs) that include BID, Vietcombank, the Vietnam Bank for Agriculture and Rural Development (VBARD), and the Bank for Commerce and Industry (BCI). The SOCBs account for more than 70 per cent of the total assets of the whole system. Not surprisingly, SOCBs dominate the credit market with 73.5 per cent of total lending to the economy as of 2002 (World Bank, 2002). The dominance is also mirrored in the mobilization of funds where the SOCBs captured 76 per cent of all resources mobilized through formal institutions. The main customers of SOCBs have been the state-owned enterprises (SOEs) which contribute 75 per cent of the economic output and hold 53 per cent of the banks' loans (*Vietnam Investment Review*, 2003). SOCBs have recently initiated a credit shift to the private sector, especially SMEs (small to medium enterprises) and households. Today, SOCBs are a substantial credit provider for rural Vietnamese households. Among them, the Vietnam bank for Agricultural and Rural Development (VBARD) supplied credit to 33 percent of rural households in 1998 (Dao V.H *et al.*, 1999).

In addition to the SOCBs, there are 36 joint-stock banks (JSBs) in Vietnam. JSBs are supposed to fill the gap in serving the private sector. However, their position appears to be modest. Despite a considerable growth in number, JSBs have been exposed to high competition and high risk due to their inherent nature: low capital base, a small number of branches, inadequate banking services and concentration in two host business centres. With 15 per cent of the lending market, JSBs primarily serve the private sector, particularly local businesses and small enterprises. However, rapid loan growth and weak capacity to assess credit risk could result in non-performing loan problems, and JSBs may not have adequate access to external sources of recapitalization.

The formal financial sector in Vietnam also contains branches of 27 Foreign Banks. However, foreign banks in Vietnam are far from becoming fully fledged participants on the Vietnamese financial sector due to the current regulatory structures and costly acquisition of information. As a result, they are mainly engaged in lending to foreign-owned enterprises. There are also some financial institutions in Vietnam that provide subsidized credit.

The most important example of this group is the Vietnam bank for the Poor (VBP), currently known as the Vietnam Bank for Social Policy. This bank was established in 1995. The VBP mainly focuses on poverty alleviation. By 2002, the VBP has offered credit to the poor at a substantial outreach, totalling to US\$ 452 million in credit to some 2.7 million households (World Bank 2002). In March 2003, VBP has been recognized as a new policy bank, Vietnam Bank for Social Policy (VBSP). In addition, there are some credit cooperatives, various national development programmes, such as the poverty alleviation programme and the job creation programme, and some savings and credit schemes supported by NGOs and foreign donors. Finally, there are four joint-venture banks, nine financial-lease companies, and a few securities and insurance companies. However, these financial institutions play a minor role. That also holds for the only stock exchange in Vietnam, which was established in 2000 in Ho Chi Minh City.

Despite the long list of formal financial institutions in Vietnam, it appears that many households fail to gain access to formal credit. Very often formal financial institutions maintain awkward and time-consuming procedures, creating high transaction costs in household lending (Le K. N., 2003). Consequently, many households have little incentive to pursue formal credit (McCarty, 2001).

IT WOULD BE NICE IF SOME SPECIFIC INFORMATION ABOUT THE FORMAL CREDIT MARKET IN THE MEKONG DELTA COULD BE ADDED. IS THIS POSSIBLE?

### **3. Farming Household's Access to Formal Credit in Vietnam: A Survey**

The formal financial sector appears to be inadequate in fulfilling the credit needs of Vietnamese households. Some households have access to formal credit, while others are denied formal credit. By reviewing the existing literature on access to formal credit in Vietnam, this section aims to provide a first indication about the main determinants that explain access for formal credit.

The strategy of almost all empirical studies on the determinants of access to formal credit is similar. First, a proxy for households' access to formal credit is identified. Mostly, a binary variable is constructed. Second, the determinants of households' access to formal credit are examined by estimating a Probit or a Logit model. Finally, for those households that have access to formal credit, it is examined which determinants can explain the size of the formal loan. Mostly, an Ordinary Least Square (OLS) regression model or a Tobit model is used. In some cases, the determinants of the size of the formal loan and the probability of access to formal loans is estimated simultaneously by a two step regression model, such as the Heckman model.

Tran (1998) uses a Logit model and Ordinary Least Square (OLS) regressions to examine determinants of households' access to formal credit in Vietnam. His study shows that farm size, farm size squared, total number of household members, number of dependents, the possibility of pledging collateral, and social participation have a significant impact on the probability of access to formal credit. The same set of variables explains the size of the formal loan. Vu (2001) examines access to formal credit in the Red River Delta region in Vietnam. Her study suggests that especially land size and social position is important in explaining access to formal credit. Pham and Izumida (2002) study determinants of access to formal rural credit in Vietnam. They point at the importance of the size of the farming area, the age of the household head, the education of household head, total production value of livestock, number of adults, and the number of dependants. Quach, Mullineux and Murinde (2005) apply a Heckman two-step model to examine the impact of rural credit on household poverty in Vietnam. They also examine the determinants of access to formal credit. Their study points at the importance of the ability to get informal funds, financial and non-financial savings, household size, and land size. Tra and Lensink (2007) compare lending policies of formal, informal and semi-formal lenders with respect to household lending in Vietnam. Their analysis suggests that the probability of access to formal credit increases if borrowers provide collateral, a guarantor and/ or borrow for business related activities. It also appears that the probability of access to formal credit increases in household welfare up to a certain threshold, but at a decreasing rate.

Although results differ somewhat for the above mentioned studies, a clear picture emerges. The probability of access to formal credit appears to depend on borrower characteristics, such as age, income, education, social position in the village, and the possibility of pledging collateral. In the remainder of this paper, we will examine whether the same holds for access to formal credit in the Mekong River Delta in Vietnam.

#### 4. Data Description

The section explains the data selection and provides a descriptive analysis of the main variables. Since no secondary data is available, a survey has been done in the rural Mekong Delta in October 2005. The sample includes 240 farming households spreading over four provinces in the Mekong Delta, *i.e.* Tien Giang, Dong Thap, Can Tho and Soc Trang. In each province, we selected one rural district and then chose two communes randomly. The data contain information on households' characteristics, loan characteristics, credit behavior of borrowers and so on. These data will be used to analyze the determinants of farm household's access to formal credit.

The households in the sample were selected and interviewed randomly. The survey is conducted with the help of twelve last-year economic students at Can Tho University. Interviews were directly conducted at the site of households in the survey region.

The surveyed sample has some strengths and weaknesses. Strengths of this sample are the size of the sample and the reliable information collected. One of those weaknesses is that data were collected from farming households that are relatively easy to reach. It does not include remote areas, so that the data may suffer from some selection bias.

We also use data from the World Bank, VBARD annual reports, VLSS and other studies to describe credit activities in rural Vietnam. These data provide information about the rural financial market, the main credit suppliers, and the financial system in Vietnam.

Table 1 provides information about the relative amount of borrowers that obtained credit.

**Table 1: Borrowing Statistics**

Borrowed	Frequencies	Percentages
No	116	48.33
Yes	124	51.67
Total	240	100.00

*Source: Own calculation from the survey data, 2005.*

Table 1 shows that from the 240 farm households that were interviewed, there are 124 households that had access to formal credit; accounting for 51.67 percent of the total number

of households in the sample; 116 households did not have access to formal credit (48.33 percent).

Some additional information about the sample is given in Table 2 and Table 3. Table 2 shows the distribution of loans from different financial institutions. Most loans come from VBARD. The Nhon Ai bank is the least importance in terms of the amount of loans.

**Table 2: Statistic of borrowed farming households by institutions**

<b>Formal institutions</b>	<b>Frequencies</b>	<b>Percentages</b>
VBARD	78	65.00
VBSP	17	14.17
Women's Union	8	6.66
Sacombank	6	5.00
Housing development bank	5	4.17
Credit cooperatives	4	3.33
Nhon Ai bank	2	1.67
<b>Total</b>	<b>124</b>	<b>100.00</b>

*Source: Own calculation from the survey data, 2005.*

Table 3 shows that the average formal loan size is about VND 14.8 million. The largest loan size comes from the Sacombank, VND 36.67 million on average. The smallest loan is from the Women's union, on average VND 2.52 million. It appears that most farming households that borrowed from formal sectors are rich or are large. Moreover, they were able to pledge collateral. The table also shows that interest rates differ. While VBSP and Women's Union have a low average interest rate at approximately 0.7 percent, other formal institutions have interest rate just greater than 1 percent. This may be explained by the fact that the Vietnamese government has followed the traditional approach to establish formal financial system in rural credit markets; it advocates cheap credit to support farm households and agricultural production, formal institutions provide loans with low interest rates. Before 2002, the State Bank of Vietnam had imposed the ceiling interest rate that resulted in low interest rates.

Table 3 also shows that average transaction costs are about VND 45,630. These costs refer to cost of taking loan. It includes transportation cost, cost of taking necessary documents to obtain loan, cost of collateral procedure. Other costs rising when applying to receiving a loan such as time lost and opportunity cost are not included in transaction cost because we can not measure it exactly. Farming households take loan from Women's Union with lowest transaction cost and largest one from Housing Development Bank.

**Table 3: Statistic of some credit characteristics (averages)**

<b>Formal institutions</b>	<b>Loan size (million VND)</b>	<b>Interest (percent per month)</b>	<b>Cost of taking loan per time (thousand VND)</b>	<b>Repayment duration (months)</b>
VBARD	14.94	1.07	52.79	20
VBSP	9.21	0.70	28.33	21
Women's Union	2.52	0.78	5.00	12
Sacombank	36.67	1.06	16.67	32
Housing development bank	23.40	1.06	60.00	39
Credit cooperatives	13.75	1.05	30.00	27
Nhon Ai bank	22.50	1.05	50.00	12
<b>Total</b>	<b>14.80</b>	<b>1.00</b>	<b>45.63</b>	<b>20.95</b>

*Source: Own calculation from the survey data, 2005.*

The survey indicated that the average repayment period in the formal sector is about 21 months. Farming households borrow credit from formal institutions to finance their production such as rice growing, orchard planting or feeding livestock. The repayment period varies between 12 months and 39 months.

Table 4 indicates that the average formal loan size is VND 8.82 million. Positive skewness value means that the formal loan size that is obtained by farming households mainly contains small loans. The sample includes 116 farming households that did not borrow, leading to a kurtosis of 37.

Table 4 also shows that in the survey area, the average land size of household is 8.96 thousands meter square. The land size of household variable largely varies across farming

households because its standard deviation is relatively large as compared to its mean. A positive skewness of 2.98 and kurtosis of 14.44 means that the size of household land distribution has a long right tail: many farming households had small size of land in October 2005.

The average farming household income, age of farming household head, education of farming household head variables also have positive skewness and great values of kurtosis mean that distributions of these variables also have long right tails: many farming households have small values of these variables.

**Table 4: Descriptive statistics of variables**

<b>Variables</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Skewnes s</b>	<b>Kurtosis</b>
Formal	0.52	0.50	-0.07	1.01
Forloan	8.82	21.08	5.13	37
Red	0.88	0.33	-2.33	6.41
Age	51	13	0.25	2.76
Sex	0.83	0.38	-1.75	4.06
Income	45.41	60.23	6.39	63.69
Social	0.33	0.47	0.75	1.56
Informal	0.27	0.45	1.03	2.06
Reason	0.76	0.43	-1.21	2.45
Land	8.96	9.77	2.98	14.44
Education	6.13	3.24	0.43	2.58
Collateral	0.38	0.49	0.50	1.25

*Source: Statistic from the survey data, 2005.*

Table 4 also indicates that 52 percent of farming households borrowed from the formal sector and only 27 percent of farming households borrowed from the informal sector. 38

percent of farming household submitted collateral when they took loans. Household heads that have social or political positions in local authority account for 33 percent of total number of household heads in the survey sample. 83 percent of farming household heads is male. 76 percent of farming households applies to get formal loan with production purpose. And 88 percent of households have "Red" certificate of the land use rights.

WHY DO THE ABOVE FIGURES DIFFER FROM THE FIGURES IN TABLES 1, 2 AND 3??? GIVE BETTER EXPLANATION, AND ALSO EXPLAIN WHAT IS MEANT BY FORLAON ETC AND OTHER ABBREVIATIONS!!!!

#### **4. The Estimation methodology and the independent variables**

There are two dependent variables in this study: a binary dummy for access to formal credit by farm households, and a continuous variable for the loan amount per household. The dummy variable is named *formal*. It takes a value equal to one if a farming household uses a formal loan, and zero otherwise. We use a Heckman two-step model to examine the determinants of access to credit and the loan size. The Heckman selection model provides consistent, asymptotically efficient estimates for all parameters in the model.

The Heckman model uses, in the first step, a Probit model to examine which variables positively affect the probability of using formal credit by farming households. The Heckman model also estimates the determinants of the size of the loan, by applying an Ordinary Least Square (OLS) regression model in a second step.

The vector of explanatory variables in the first step includes age, sex, social or political positions of the farming household head, a dummy variable indicating whether a farming household has a loan from the informal sector, and a dummy variable indicating whether a household has a certificate of land used right. The vector of explanatory variables in the second step includes purpose of the loan, total income of the farming household, a dummy variable indicating whether collateral is pledged, land size of the farming household, and education of the farming household head.

Table 5 provides information on the expected sign of the independent variables in the two steps.

Table 5: Summary of variables with expected signs considering in models

Variables	Abbreviation	Unit	Expected sign	
			(1)	(2)
Household with "red" certification of land use right	Red	Yes = 1	+	no
Age of farming household head	Age	number	+/-	no
Sex of farming household head	Sex	Male = 1	+/-	no
Total income of farming household	Income	VND million	no	-/+
Social or political of household head	Social	Yes = 1	+	no
Land size of farming household	Land	thousand m <sup>2</sup>	no	+
Education of farming household head	Education	number	no	-/+
Farming household having loan from informal source	Informal	Yes = 1	-	no
Purpose when farming household apply to obtain formal loan	Reason	Production = 1	no	-/+
Farming households mortgage collateral when they borrow	Collateral	Yes = 1	no	+

Note: (1) refers to the first step in the Heckman model;

(2) refers to the second step in the Heckman model

### **WHAT IS MEANT WITH NO?????**

The independent variables are defined as follows:

**ONE NEEDS TO USE THE SAME VARIABLE NAMES OR ABBREVIATIONS IN THE TABLE AND THE EXPLANATION BELOW. PLEASE MAKE IT CONSISTENT!!!**

**Collateral** is a dummy variable that indicates whether a farming household does or does not pledge collateral when applying loan. This variable takes a value of one if a farming household borrowed with collateral; it is zero if it has not.

**Income** is the average income per year of farming household. If income of a farming household is high the demand for credit may be low since they have enough money to support their expenditures. This variable is measured in VND million (Pham and Izumida, 2002).

**Age** measures the age of the farming household head. Older households control more resources, have more experience, better reputation, and responsibility. Therefore they are more likely to use formal credit. Young households often consume more than they save, which implies that they may need more loans. Moreover, young household heads adopt quickly new technologies and are willing to take risk. This also indicates that young households have a higher demand for credit and tend to take loans from both formal and informal sources. However, it may be difficult for the young households to get credit because they are considered to be inexperienced and have a bad reputation (Nguyen, 2003). If this holds, the probability that young households use formal credit will be low.

**Sex** is sex of farming household head. This is a dummy variable. The variable takes a value one if the farm household head is male and zero if the farm household head is a female. Male tends to borrow from formal sector while females favor to take loans from informal sources. However, formal lenders do not discourage women to borrow, and there are even some credit programs providing women only (Tran, 1998). Moreover, our conversation with farm households in the survey region revealed that both husband and wife made decision to apply for credit. Hence, the effect of sex of the household head on the probability of access to credit is ambiguous.

**Land** is the size of owned land of farming household. Land owned by farming household in the survey region includes cropland, garden land, house building land and other land. It can be used as collateral for formal credit. Lenders consider households possessing a large area of land as safe customers. Farming households with large size of land would have a higher repayment capacity. Moreover, default can be reduced if large land is pledged as collateral and risk is managed better. This independent variable is measured by thousand meters square (Tran, 1998; Le, 2002).

**Social** is a dummy independent variable that represents social or political status of farming household head. This variable can be understood that farming household heads have social or political positions of local authority such as village leaders, commune leaders, leaders of Women's unions, Farmers' associations. This variable takes a value of one if farming household head has social or political position in local authority; it is zero if he has not. Farming households that have social or political positions are often access to the government and NGOs programs or lending policy of banks. In addition, they are also considered as high prestige households by lenders. Therefore, they are easy to get credit (Tran, 1998).

**Red** is "Red" certificate of the land used rights. This is a dummy independent variable. It receives zero value if farming household has no "Red" certificate; and one if the farming household has it. Formal lenders require farm household to pledge their land used rights when borrowing. Although farming households do not make collateral procedure, they also

have to give “Red” certificate as a guarantee. The hypothesis is that if a farming household has “Red” certificate, he may have tend to get formal credit.

**Education** is education level of farming household head. This independent variable is measured by number of the school years of farming household head. Better-educated farming households depend more on self-finance and on formal credit source, because they may be better ability to exploit investment opportunities and to better understand loan regulations as well as the borrowing procedure of the formal sector. Therefore, farming households with higher education levels will prefer to get credit in the formal sector (Nguyen, 2001).

**Reason** is purpose when farming household apply to obtain formal loan. It is a dummy variable. This variable takes a value of one if farming household applied from formal sector with purpose for production expenses; it is zero if he applied for non-production expenses.

**Informal** is a dummy variable. It represents whether farming household does or does not have a loan from informal source when they applied. This variable takes a value of one if farming household borrowed from informal sector; it is zero if he has not. It is hypothesized that if farming household has a loan from informal sector, he has financed a part of his expenditure demand, then less credit demand from formal source.

Through the above-mentioned justification of the independent variables, it is reasonable to consider these variables in following Heckman two-steps model. Expected signs of these explanatory variables are summarized in the following table.

## **6. Empirical results**

The results of the Heckman two-step model are presented in Table 6. The Wald ratio test rejects the null hypothesis that all slope coefficients are equal to zero. It indicates that the goodness-of-fit of this model is high.

There are 4 parameters that are statistically significant at the 10 or 5 percent significance levels. The Age of the farming household head has a significant impact on the probability of access to formal credit at the 10 percent significance level. The regression indicates that Older farming households often have more assets, reputation, and fully requirement for getting from the formal credit. In contrast, younger farming households often lack of capital and other conditions like older households. However, they are active and easy to adopt new technology for agricultural production; therefore, they have high demand for credit. Formal lenders consider that young farming households have high production capacity and favor to lend for them.

Although having opposite expected sign, sex of household head is also statistically significant at 5 percent significant level in the selection model. Theoretical review supports that male household head favor to borrow in the formal source of credit and female household head depends on the informal sector. Data processing results seem to advocate this argument. In formal one, male household head tends to get credit than female one.

Estimated parameter of *Social* variable is not statistically significant in the selection model. It implies that the formal lenders do not favor to lend for farming households that have influential or responsibility in the commune.

I THINK YOU NEED TO PRESENT MORE ALTERNATIVE ESTIMATES, AND EXPLAIN BETTER WHY SOME VARIABLES ARE USED N THE FIRST STEP WHILE OTEHRS ARE USED IN THE SECOND STEP. MOST IMPORTANTLY, PRESENT MORE ESTIMATES AND THEN MAKE A CHOICE ABOUT WHICH ONE IS THE RPEFERRED ESTIMATE!!

Table 6: Results of Heckman two-steps model

	<b>Coefficient</b>	<b>t - value</b>	<b>P value</b>
<b>Forloan (second step)</b>			
Reason	- 14351	-3.17	0.001
Collateral	21873	4.84	0.000
Income	0.0826	0.82	0.416
Land	198	2.90	0.004
Education	1403	2.38	0.014
_cons	6655	0.80	0.357
<b>Formal (first step)</b>			
Age	-0.0124	-1.79	0.085
Sex	0.6282	2.55	0.012
Social	0.2764	1.43	0.145
Red	0.7726	-5.70	0.010
Informal	-0.9137	2.49	0.000
_cons	-0.3198	-0.57	0.508
Number of observations			240
Number of positive observations			124
Wald $\chi^2$			98.84
Probability greater than $\chi^2$ (F-test)			0.0000

Note: Significant at 10 percent level if P value is smaller than or equal to 0.1

Significant at 5 percent level if P value is smaller than or equal to 0.05

*ALSO PROVIDE INFORMATION, IN THE TABLE, ABOUT HECKMAN'S LAMDBA (OR WHATEVER THAT IS CALLED: THE STATISTIC THAT TESTS THE RELEVANCE AND APPROPRIATENESS OF USING EHCKMAN)!!!*

*Red* of the land use rights has also a significant impact on the probability to get formal credit at 5 percent significant level. Formal lenders consider certificate of the land use rights as collateral although in many cases farming households do not mortgage it. However, to obtain formal loan, farming households must pledge it with banks. So if farming households have *Red*, they may tend to favor in getting formal credit. Result of the selection model supports that if household have certificate of the land used rights, the probability to get formal credit of farming households will increase.

*Informal* variable has a negative significant effect on selection model at 1 percent significant level. Theoretical review argues that if farming households do not obtain formal loan, they must suffer to borrow from informal sector. Therefore, if farming households realize that they do not have full conditions to get formal credit, they will apply to obtain informal credit instead of applying for formal credit source. And then the probability to get formal credit will be decrease.

As shown in Table 6, there are also 4 significant estimated coefficients in the regression model. That means the formal loan size that farming household received depending on *reason*, *collateral*, *land* and *education* variables. We will explain effect of each independent variable step by step.

*Reason* variable has negative significant effect on the formal loan size at 1 percent significant level. That means formal lenders give smaller loan size for farming household if they apply to get formal loan with production purpose. In the survey region, farming

households often apply with big amount of formal loan when they need credit for non-production purposes such as using for house-building, purchasing agricultural machine, etc.

*Collateral* is very high significant impact on the formal loan size at 1 percent significant level. The formal lenders ask farming household to submit collateral to reduce risk when they borrow more than 10 million VND. In rural area, farming households use certificate of the land used rights as collateral to pledge with the formal lenders when they apply and get big formal loan size.

Coefficient of average farming household income variable is not significant different from zero in regression model. Literature review suggests that farming households with high income will be less demand of credit because they can finance for their expenditure themselves. But the regression model shows that formal lenders give loan not based on farming household income.

Estimated coefficient of the land size variable has positive expected sign. This variable is significant impact on the loan size that farming household access to formal credit at 1 percent significant level. Land size characterizes ability to widen production of the farming household so high demand for credit. If farming households have larger land sizes, they will need more capital to expand production or transform production structure thus high demand for the formal credit. On viewpoint of the formal lenders, large land size is also considered as high collateral, and hence they will accept to lend with a big amount of loan.

Farming household with higher education level of household head can do better business and create larger return. These farming households may have high demand for credit and then they apply and get big amount of loan. It can be explained because with higher education level, farming household heads can write a lot of good production or business planning.

TRY TO IMPROVE ENGLISH USAGE ABOVE!!!!

I STILL NEED TO DO THE CONCLUSIONS BUT WILL DO THAT AFTER THE ABOVE MADE COMMENTS ARE TAKEN INTO ACCOUNT.

## 6. Conclusion

This paper studies the determinants of farming household's access to formal credit in the Mekong Delta, Vietnam..

REWRITE THE PARAGRAPHS BELOW. THE ENGLISH SHOULD BE IMPROVED, AND THE ETXT SHOULD BE STRUCTURED!!!

e running result table of Heckman two-steps model illustrates that *age, sex, red, informal* variables have relationship with the probability of access to credit in formal source. There are also four variables significant impact on the loan size that farming household borrowed from formal institutions. Those regressors are *reason, collateral, land* and *education*.

### 6.2 Recommendations

Nowadays, household economics is considered as basic unit corresponding with private enterprises in social-economic development process of rural Vietnam. And one of these main factors is provision credit to households because lack of capital is major obstacle of rural development. Findings in section 5 and the above conclusion show that most independent variables have significant impact on farming household's access to credit. Decision to borrow of borrowers or lend of lenders depends heavily on household characteristics. Therefore, to improve farming household's access to credit, some recommendations are listed here.

The first recommendation is that the process of granting land titles should be completed. Farming households are peasant households with a relatively large land area, but there are still twelve percent of the interviewed households considered as lacking collateral in the banks' perception. The results of the regression analysis have shown that land title has a positive and significant effect on the probability for farming households' access to formal credit. So to increase farming households' access to formal credit, the government should issue policies to speed up and complete the land title granting process.

The second recommendation based on situation that banks mainly lend due to land size of farming household. They consider "red" certificate as collateral. But when they evaluate collateral to make decision to lend, they regard value of land due to regulation of the government that is very low compared with market price. As a matter of fact, they do lend with small amount of loan. If the formal lenders pay attention on solving this matter, they may increase farming household's access to formal credit.

The third policy implication is to improve education of farming household heads. The positive relationship between farming household head education level and the extent of access to bank credit implies that improvement in education is one solution to make it easier for farming households to access to bank credit.

Those are some recommendations, it is hoped that they may create better operating environment of lenders as well as farming households' access to credit. However, with limitation of time, this paper is only an analysis result of a small study in formal sources of credit. It can expand to informal sector for the Mekong Delta region in further studies.

REFERENCES NEED TO BE CHECKED VERY VERY CAREFULLY!!!

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<sup>1</sup> This section draws heavily from Tra and Lensink (2008).