Chapter 3

Determinants of Loan Sizes of Microcredit for Villages and Communities in Thailand

The factors determining probability of participation in the MVC is presented in the last chapter. This chapter focuses on the intensity of participation particularly on the loan size, which are varying in different households. A large number of studies have shown the significant impact of microcredit program on poverty alleviation. However, some empirical studies have shown that the impact depend on its loan size. A very small amount of loan may not be enough for the income generating activities. The purpose of this chapter is to investigate key factors that determine loan sizes of MVC and the accessibility of the poor to get the loan.

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ABSTRACT

This paper investigates the determinants of loan sizes of microcredit for villages and communities (MVC) in Thailand and the accessibility of the poor to get the loan. The data are from Thailand's Socioeconomic Survey in 2009. The study uses Tobit and Heckman selection models to deal with censored data and possible selection bias problem. The results show that MVC mainly benefits the near poor and helps them not to fall into poverty again. Rural households of low-income and landless farmers with younger, female and uneducated heads whose income are just above the poverty line tend to get larger loan sizes. In contrast, the poor do not significantly get larger loan sizes than the non-poor or even the near poor. This phenomenon may violate the principle of MVC that the loan should reach the poor more intensively than the non-poor.

Keywords: microcredit, village fund, urban community fund, loan size, poverty reduction

JEL classification: G21, R51, I38

3.1 Introduction

Microcredit for villages and Communities program (MVC) targets poor households who have limited access to formal loans. It reduces the ratio of credit exclusion in many countries. It aims to help the poor to get out of poverty. Following these concepts, MVC program has been established as a part of Thai government's poverty alleviation policy since 2001. It allocates one million Baht per village or community as a village fund or an urban community fund for investment and

consumption. It is the largest government's microcredit program in Thailand and one of the biggest microcredit program in the world.

This paper focuses on the role of microfinance institutions in providing loan to the poor especially the determinants of loan sizes that the poor get from the funds. Loan sizes vary in different regions. In 2010, the average loan size per household in South Asia was small (USD144). The number was more than 10 times larger in Eastern Europe and Central Asia (USD1,684). Total gross loan for the world was around USD67 billion. Microfinance has reached around 100 million individuals worldwide especially in South Asian regions (Table 3.1).

Table 3.1: Microfinance Information by Regions in 2010

Regions	Average loan size per household (USD)	Gross loan (Billion USD)	No. of active Borrowers (Million)
Africa	371.9	4.6	4.5
East Asia and the Pacific	304.9	21.2	15.8
Eastern Europe and Central Asia	1,684.7	8.2	2.7
Latin America and the Caribbean	1,031.6	22.9	15.0
Middle East and North Africa	610.8	1.2	2.2
South Asia	144.0	9.0	58.6
World	691.3	67.1	98.8

Source: www.mixmarket.org

A large number of empirical studies have shown positive effects of microcredit on economic and social aspects. For example, microcredit can raise household income and reduce poverty (Berhane and Gardebroek, 2011; Nader, 2008; Khandker, 2001). It can improve consumption and social indicators such as health and education (Nader, 2008; Coleman, 1999). However, some studies have shown that the impact of microcredit may depend on its loan size. A too small amount of credit may not enough for the generation of household income (Coleman, 2006; Coleman, 1999). Moreover, microcredit may be able to reduce poverty after passing a threshold of the

loan size (Zaman, 1999). The impact of microcredit on poverty reduction may decline with cumulative loan size (Khandker, 1998). This leads to the research question; what are determinants of loan sizes and the accessibility of the poor to get the loan?

This paper investigates key factors that determine loan sizes of microcredit for villages and communities. Households and individuals with different characteristics, e.g. age and education may have different levels of capabilities that lead to the difference in possibilities to borrow and the granted loan sizes. In econometric modeling, this study treats selection bias problem which may occur from the self-selection in borrowing the loan (Imai, et al, 2010; Coleman, 2006; Khandker, 2001). The study will use Tobit and Heckman selection models to treat censored data and selection bias problem.

3.2 Literature Review

3.2.1 Microfinance in Thailand and the Village and Urban Community Fund

Thailand has a long history in microfinance development. Microcredit was introduced in Thailand as part of the rural development strategy in the mid 1970s. It aims to develop the rural credit market (Menkhoff and Rungruxsirivorn, 2011). Microfinance in Thailand is divided by the Ministry of Finance (MOF) into three main categories (The Foundation for Development Cooperation and The Banking with the Poor Network, 2010) as follows:

(1) Formal microfinance institutions are those formal financial institutions operating under prudential regulation.

(2) Semi-formal microfinance institutions are legal and member-based. They operate under non-prudential regulation to promote savings and investment within community. They include registered saving groups, credit union, agricultural cooperatives and the village and urban community funds which provide microcredit for villages and communities.

(3) Informal microfinance institutions are independent, self-reliant and community-based organizations usually established under supports from NGOs, local governments and monks.

The MVC program is classified as the semi-formal microfinance institutions. It has been established since 2001. The government revolutionized the credit market by allocating one million Baht (around USD22,500)[1] per village to over 77,000 villages and urban communities through out the country in 2004. This program was one of the largest microfinance programs in the world (Menkhoff and Rungruxsirivorn, 2011). It put about 77 billion Baht or approximately 1.5 percent of the Thai GDP to the economy. As a result, this program is highly important in credit market especially in rural area. In 2010, the MVC program extended to around 79,000 villages and had members around 12 million people. Moreover, after the general election in 2011, the government announced another attractive policy to increase accessibility to the microcredit market by increasing the MVC program to two million Baht (around USD65,800)[2] for each village.

There are three official objectives of MVC according to the Act of National Village and Urban Community Fund 2004. First, the fund is a revolving fund for investment, job creation, income generation, and welfare improvement. Second it serves as an emergency fund. Third it aims to develop rural economy.

The organization of MVC consists of two levels of administration. First, the National Village and Urban Community Fund committee of the central government will take care of the fund at the national level. Second, the local committees at the village level consist of around 15 members in each committee. They will be elected from villagers who are residents of that village and have lived in the village at least for 2 years. Half of local committee members must be women. The local committee will decide who should get the loan. The conditions basically include the members' ability to repay, the purpose of borrowing, and the loan size (Menkhoff and Rungruxsirivorn, 2011; Boonperm, et al., 2009; Kaboski and Townsend, 2009).

The central regulation states that the loan size cannot exceed THB20,000 per borrower. In some cases, it can be extended to THB50,000. However, data from Thailand's socio-economic survey show that some households present more than one borrower. The interest rate must be less than or equal to 15 percent per year. The repayment has to be made within two years according to the renewed regulation

[1] In 2001, the average exchange rate was USD1 = THB 44.5.
[2] In 2011, the average exchange rate was USD1 = THB 30.4.

in 2009. A borrower must be guaranteed by at least two persons for the repayment. A borrower will receive the money and repay the debt through the Bank for Agriculture and Agricultural Cooperatives (BAAC)[3] and the Government Saving Bank (GSB)[4].

The focus of MVC program is on community-based empowerment and self-reliance which are based on flexible and adjustable rules that meet the community's need. The close relationship between local committee and members reduces the cost of imperfect information because they know each other. In particular, the committee is able to identify the risk of each borrower and also his or her ability to repay the loan.

3.2.2 Determinants of Loan Sizes

Raijman (2001) suggested that households set the amounts of loan that they would like to borrow based on their entrepreneurship, ability to invest, and ability to manage risk. Kedir (2003) analyzed the data from Ethiopian Urban Household Survey in 2000 and found that geographical location of households, current household resources, schooling of household heads, value of assets, numbers of dependents, marital status and outstanding debt are significant factors that determined loan sizes of urban households.

Khandker (2005) investigated determinants of demand for loans from a group-based microfinance program in Bangladesh. He separated the analysis between male and female borrowers. The results showed that the landless poor needed more loans than the rich. Moreover, education and human capital of households also affected the demand for microcredit. Education for women had a negative effect on the loan size. Oboh and Kushwaha (2009) identified socio-economic factors that determine loan sizes for farmers in Nigeria. They found that annual income, distance, farm size and previous loan status significantly encouraged farmers to get larger loan sizes.

In Thailand, Coleman (1999) estimated household factors influencing loan sizes of microcredit in Northeast Thailand using Tobit model. The

[3] In 1966, the government established the Bank for Agriculture and Agricultural Cooperatives (BAAC) as a state-owned enterprise in order to extend credit directly to individual farmers and farmers' institutions.

[4] King Vajiravudh (Rama VI) introduced saving service to Thailand and established the saving office in 1913. The office was renamed to the Government Saving Bank (GSB) in 1947.

results indicated that age, gender, education, social capital e.g. credit worthiness, social tie in the village, and female land owner were influential to the amount of loans. Later in 2006, Coleman evaluated the outreach and impact of two village funds in the Northeast Thailand. He included the duration of being a member or committee of the village fund as an important determinant of the loan size. The important results indicated that loans between THB1,500 to THB7,500 would have no impact because it was too small to be productive. His results also indicated that the positive impact was larger in the wealthy group who had influential positions as committees in the fund. They used their positions to get more loan than the ceiling amount (THB20,000 per person) by using multiple names to borrow. Impact on members who are poorer was significantly smaller than the impact on the wealthier members. The different impacts between these two groups could be the results from different accesses to loans which led to the investment in different types of projects which yielded different returns.

Poor households may get smaller loan sizes than the non-poor. Suriya (2011a) pointed out from the survey data of a village in the North of Thailand that most of poor households reached the limit of loans because they did not return previous loans, then they could not apply for new credits. Only the richest or second richest quintiles of households in the village were capable to apply for microcredit.

3.3 Research Methodology

This paper uses poverty index and poverty gap as key testing variables to test the accessibility of the poor to get the loan. The calculation of both variables follows Foster, Greer and Thorbecke (1984) as shown below.

Poverty index: $$P_0 = \frac{1}{N}\sum_{i=1}^{N} I(y_i < Z)$$

Poverty gap: $$P_1 = \frac{1}{N}\sum_{i=1}^{N} \frac{G_i}{Z}$$

where $G_i = (Z - y_i).I(y_i < Z)$ and *I(.)* is an indicator function that can be set to 1 if the expression in the bracket is true, and 0 if it is false. The variable y_i is the average monthly consumption expenditure per capita which includes food, beverage, tobacco and other goods and services. *Z* is the poverty line in 2009 that was provided by

National Economic and Social Development Board of Thailand (NESDB). The conversions of the national poverty line into provincial poverty lines are presented in Appendix A.

Moreover, the study adds the interaction between being poor and the incapability to access to other credits to be another testing variable. With this variable, it aims to dig deeper and answer whether the poor who cannot access to other sources of credit can get larger loan sizes than other groups. For the controlled variables, the models include household head characteristics, demographics, occupations, income, assets and other related factors.

3.3.1 The Models

To model the determinants of loan sizes, it should be concerned that the data may not be randomized and face the self-selection process. Some households did not borrow the loan because they might not need the credit or did not want to get more loans even though they were potential to get a large amount of loan. This study applies Tobit and Heckman selection models to treat these censored data and selection bias problem. The details of each model are presented in the next section.

(a) Tobit Model

Tobit model has been introduced by James Tobin since 1958. It can be applied to models with continuous dependent variable such as loan sizes. The observations can be classified into two groups according to their values of dependent variables, zero for non-borrowers and positive value for borrowers. Ordinary least squares (OLS) estimation using only observations with positive values of the dependent variable is biased and inconsistent (Maddala, 1983). Tobit corrects such problems when it uses the information from all observations both with zero and positive values of the dependent variable (Brehanu and Fufa, 2008; Maddala, 1983;).

Logically, a household chooses to borrow when its utility of borrowing exceeds the utility of not borrowing. The utility of borrowing, y_i^*, is a latent variable and depends on some factors. Increasing the loan size will raise the utility. Thus, for each household *i*, the utility can be presented as a function of observed household characteristics, X_i, and unobserved characteristics, ε_i . An

underlying assumption is that a household chooses to borrow if y_i^* exceeds a certain threshold level, θ. The error term, ε_i, is assumed to be normal distributed with zero mean and constant variance, σ^2. Tobit model is described by Maddala (1983) as follows:

$$y_i^* = X_i\beta + \varepsilon_i$$

$$y_i = y_i^* \quad if \quad y_i^* > \theta \tag{3.1}$$

$$y_i = 0 \quad if \quad y_i^* \leq \theta$$

where the dependent variable, y_i, is the loan size which is positive and equals to y_i^* for borrowers. It is zero for non-borrowers. The variables X_i are household characteristics including testing variables (poverty status, poverty gap and interaction between being poor and incapability to access to other sources of loan) and controlled variables. The parameters β will be estimated by maximum likelihood.

(b) Heckman Selection Model

Self selection appears in the decision to borrow. People may choose not to borrow because they do not want to go into debt or they are not satisfied with too small amount of loan. The self selection will lead to selection bias. Heckman selection model which has been introduced by Heckman since 1979 can correct this problem (Suriya, 2011b; Imai, et al, 2010).

The model consists of two equations, the selection equation and outcome equation. The selection equation reveals the determinants of borrowers. It explains why some households are censored which means they do not borrow. The outcome equation will explain the loan sizes.

As discussed in Tobit model, a household chooses to borrow when its utility of borrowing exceeds the utility of not borrowing. The utility of borrowing, y_{1i}^*, is unobserved or latent. It depends on household characteristics, Z_i, such as household head characteristics, demographics, occupations, income, assets, rural location, accessibility to other sources of credit and difficulty to get emergency loan. The error term, ε_{1i}, collects unobserved characteristics which affect the utility of borrowing.

The variable y_{2i} in the outcome equation is the loan size which is observed only when household *i* decides to borrow or when y_{1i} equals to 1. The variable y_{2i} is partially observable. Some observations are censored when they prefer not to borrow. The loan sizes depend on household characteristics, X_i, which are almost the same as Z_i. The set of explanatory variables adds three testing variables and frequency of borrowing. It excludes the numbers of motorcycles and cars. Due to multicollinearity problem, the outcome equation drops the accessibility to other sources of credit. The error term, ε_{2i}, presents unobserved characteristics which affect the loan size. The model is defined as follows:

Selection equation:

$$y_{1i}^{*} = Z_i\beta + \varepsilon_{1i}$$

$$y_{1i} = 1 \quad if \quad y_{1i}^{*} > \theta \tag{3.2}$$

$$y_{1i} = 0 \quad if \quad y_{1i}^{*} \le \theta$$

Outcome equation (loan sizes):

$$y_{2i} = X_i\beta + \varepsilon_{2i} \quad if \quad y_{1i} = 1$$

$$y_{2i} = not\ observable\ if \quad y_{1i} = 0 \tag{3.3}$$

The model assumes that the joint density function of error terms in the selection and outcome equations behave as a bivariate normal distribution with zero mean and constant variances $(\sigma_1^2 = 1, \sigma_2^2)$ with a constant correlation between error terms $\left[Cov(\varepsilon_{1i}, \varepsilon_{2i}) = \rho\right]$ (Verbeek, 2004; Wooldridge, 2002). The two equations are related if correlation coefficient between error terms is not zero ($\rho \neq 0$). In this case, OLS estimation on only the outcome equation (loan sizes) would face sample selection bias problem. Heckman selection model corrects the problem by using information of non-borrower to improve the results. In this paper, the Heckman model is estimated under maximum likelihood which Nawata (2004) argued that it is better than Heckman's two-step estimator. The reason is that Heckman's two-step

estimator cannot be calculated if X_i contains all variables belonging to Z_i. Even if it can be done, the estimator is not efficient (Nawata, 2004).

It should be noted that when X_i and Z_i are the same then the results from Tobit and Heckman selection model will be the same. When X_i and Z_i are different, Heckman selection model is superior than Tobit (Verbeek, 2004). However, even though this study uses different sets of variables in X_i and Z_i and realizes the theoretical superiority of Heckman selection model over Tobit, it would like to show and compare the empirical results. The study believes that when two models confirm the same results then it is more convincing for policy makers to believe the results.

3.3.2 Data Collection

The data in this study are from Thailand's Socioeconomic Survey in 2009 conducted by National Statistical Office. The survey interviewed 43,844 households throughout the country. The municipal and rural households accounted for 60 and 40 percent. The data were collected every month throughout the year. The survey collected information on household income and expenditure in details. A special part of the participation in the MVC program has been included in the survey since 2009. A key question in the questionnaire is "Last year, did any of household members have debt from village and urban community fund?" The survey found that 10,214 households were borrowers of the MVC program. The average loan size was THB16,148. The average frequency of borrowing since 2002 was 5 rounds in 7 years. The mean annual interest rate was 6 percent. Around 40 percent of borrowers used the loan for farm businesses. Only 17 percent used it for non-farm businesses and 6 percent used the loan for refinance and house improvement. The overdue on the repayments was around 7.5 percent.

3.3.3 Data Description

After dropping observations with missing data, the sample consists of 41,296 households. Borrowers of MVC program covers 9,827 households and 10,162 people. The household characteristics are summarized in Table 3.2.

Table 3.2: Characteristics of Households (Non-borrower and Borrower)

	Non-borrower		Borrower		All respondents	
	count	%	count	%	count	%
Household head characteristics:						
Age[1]	50.60		52.30		51.01	
Women						
Yes	11,115	35.3	2,876	29.3	13,991	33.9
No	20,354	64.7	6,951	70.7	27,305	66.1
Education (years) [1]	8.16		5.84		7.60	
Single	3,586	11.4	206	2.1	3,792	9.2
Married	20,977	66.7	7,860	80.0	28,837	69.8
Widowed/ divorced/ separated	6,906	21.9	1,761	17.9	8,667	21.0
Demographics:						
Household size[1] (persons)	3.02		3.69		3.18	
Dependency ratio[1]	0.36		0.37		0.36	
Socio-economic occupations:						
Farmers who own land	2,536	8.1	2,280	23.2	4,861	11.7
Landless farmers	440	1.4	695	7.1	1,135	2.7
Fishery and agricultural services	436	1.4	200	2.0	636	1.5
Entrepreneurs	7,701	24.5	2,070	21.1	9,771	23.7
Professional and technical services	4,686	14.9	555	5.7	5,241	12.7
Farm and general workers	1,070	3.4	402	4.1	1,472	3.6
Other employees	9,103	28.9	2,265	23.1	11,368	27.5
Unemployed	5,497	17.5	1,360	13.8	6,857	16.6
Income and assets:						
Monthly income[1] (THB1,000)	24.82		17.36		23.05	
Land tenure						
Yes	21,888	69.5	9,189	93.5	31,077	75.3
No	9,581	30.5	638	6.5	10,219	24.7
Home business						
Yes	6,791	21.6	2,293	23.3	9,084	22.0
No	24,678	78.4	7,534	76.7	32,212	78.0
Number of motorcycles[1]	1.08		1.40		1.16	
Number of cars[1]	0.49		0.36		0.46	
Other variables:						
Rural household						
Yes	9,484	30.1	6,036	61.4	15,520	37.6
No	21,985	69.9	3,791	38.6	25,776	62.4
Accessibility to other sources of credit						
Yes	14,081	44.8	6,580	67.0	20,661	50.0
No	17,388	55.2	3,247	33.0	20,635	50.0
Difficulty to get emergency loan						
Yes	5,298	16.9	2,019	20.5	7,317	17.7
No	26,171	83.1	7,808	79.5	33,979	82.3
Total:	***31,469***	***76.2***	***9,827***	***23.8***	***41,296***	***100.0***

Notes: [1]mean values.

3.4 Results

To avoid multicollinearity problem among testing variables which are poverty index, poverty gap and the interaction between being poor and the

incapability to access to other sources of credits, the study separates the model into 3 models; each model contains only one testing variable.

The results from Tobit model indicate that the near poor whose income levels are just above the poverty line seem to get larger loan size. In contrast, all testing variables of the accessibility of the poor to the loan are insignificant. These results indicate that the poor does not get larger loan sizes than the non-poor.

Table 3.3: Results from Tobit Model for Determinants of Loan Sizes

Dependent variable: loan sizes from MVC in 2008			
Independent variables	**Model 1**	**Model 2**	**Model 3**
Testing variables:			
Poverty index (Being poor)	-0.3177		
	(-0.80)		
Poverty gap		-2.4638	
		(-1.33)	
Being poor and cannot access to other credits			-0.0589
			(-0.11)
Household head characteristics:			
Age	-0.0443***	-0.0444***	-0.0443***
	(-4.52)	(-4.52)	(-4.51)
Women	0.9710***	0.9710***	0.9729***
	(3.95)	(3.95)	(3.96)
Education (years)	-0.1323***	-0.1324***	-0.1315***
	(-3.78)	(-3.77)	(-3.76)
Single	-4.7153***	-4.7104***	-4.7228***
	(-9.07)	(-9.06)	(-9.08)
Widowed/ divorced/ separated	-0.9615***	-0.9564***	-0.9636***
	(-3.20)	(-3.19)	(-3.21)
Demographics:			
Household size (persons)	0.6912***	0.6971***	0.6811***
	(9.59)	(9.73)	(9.69)
Dependency ratio	-1.1913***	-1.1839***	-1.2076***
	(-3.30)	(-3.28)	(-3.34)
Socio-economic occupations:			
Landless farmers	0.2546	0.2559	0.2602
	(0.51)	(0.51)	(0.52)
Fishery and agricultural services	-0.7981	-0.7872	-0.8166
	(-1.16)	(-1.14)	(-1.18)
Entrepreneurs	-0.0971	-0.1089	-0.0756
	(-0.28)	(0.31)	(-0.22)

Table 3.3 (Continued)

Dependent variable: loan sizes from MVC in 2008			
Independent variables	**Model 1**	**Model 2**	**Model 3**
Professional and technical services	-2.3308***	-2.3404***	-2.3140***
	(-4.75)	(-4.77)	(-4.72)
Farm and general workers	0.0162	0.0098	0.0281
	(0.03)	(0.02)	(0.05)
Other employees	-0.6220*	-0.6325**	-0.6043*
	(-1.93)	(-1.97)	(-1.88)
Unemployed	-1.4918***	-1.4951***	-1.4831***
	(-4.03)	(-4.04)	(-4.01)
Income and assets:			
Monthly income (THB 1,000)	-0.0167**	-0.0169**	-0.0163**
	(-2.08)	(-2.10)	(-2.07)
Land tenure	3.7984***	3.7980***	3.8000***
	(11.31)	(11.31)	(11.32)
Home business	0.1352	0.1354	0.1377
	(0.51)	(0.51)	(0.52)
Other variables:			
Rural household	2.5198***	2.5183***	2.5238***
	(11.62)	(11.62)	(11.65)
Frequency of borrowing (since 2002)	5.4123***	5.4114***	5.4130***
	(94.12)	(94.09)	(94.09)
Constant	-19.6721***	-19.6708***	-19.6833***
	(-25.88)	(-25.86)	(-25.88)
sigma	12.6058	12.6047	12.6069
Pseudo R-squared	0.2545	0.2546	0.2545
Log pseudo likelihood	-44,184.5	-44,183.7	-44,184.5
F(21, 41276)	516.0	515.9	516.0
Total observations	41,296	41,296	41,296
Left-censored observations	31,469	31,469	31,469
uncensored observations	9,827	9,827	9,827

Notes: Numbers in parenthesis indicate *t*-statistics.
***, ** and * represent level of significance at 99%, 95% and 90%.

Moreover, results from Table 3.3 indicate that rural households who own land with female heads and larger household sizes are more likely to get larger loan sizes. Households with more frequency of borrowing since 2002 get larger amount of loan. In addition, the significantly negative sign of age and dependency ratio indicate that a younger household head with low dependency ratio is likely to get

larger loan size. Marital status shows that single, widowed, divorced, or separated household heads had significantly smaller loan sizes than the married ones which are the base case in the model. Households with more capitals both in education and income tend to borrow less. The signs on occupations of households indicate that professional and technical services also borrow less while the unemployed people are granted smaller amounts of loan.

Table 3.4: Results from Heckman Selection Model for Determinants of Loan Sizes

Dependent variable: loan sizes from MVC in 2008			
Independent variables	**Model 1**	**Model 2**	**Model 3**
Testing variables:			
Poverty index (Being poor)	-1.6693***		
	(-6.77)		
Poverty gap		-8.3146***	
		(-7.70)	
Being poor and cannot access to other credits			-2.9846***
			(-9.09)
Household head characteristics:			
Age	-0.0215*	-0.0217*	-0.0209*
	(-1.89)	(-1.91)	(-1.84)
Women	0.7643***	0.7656***	0.7668***
	(2.71)	(2.72)	(2.72)
Education (years)	-0.2280***	-0.2253***	-0.2270***
	(-4.95)	(-4.89)	(-4.94)
Single	-7.2921***	-7.2993***	-7.2483***
	(-10.36)	(-10.37)	(-10.30)
Widowed/ divorced/ separated	-2.6532***	-2.6361***	-2.6383***
	(-7.63)	(-7.58)	(-7.59)
Demographics:			
Household size (persons)	1.3477***	1.3444***	1.3277***
	(15.23)	(15.25)	(15.17)
Dependency ratio	-4.4851***	-4.4852***	-4.4781***
	(-10.51)	(-10.51)	(-10.50)
Socio-economic occupations:			
Landless farmers	3.3555***	3.3611***	3.3386***
	(6.79)	(6.81)	(6.76)
Fishery and agricultural services	-4.4912***	-4.5092***	-4.4925***
	(-5.88)	(-5.92)	(-5.87)
Entrepreneurs	-3.3247***	-3.3284***	-3.2776***
	(-8.68)	(-8.69)	(-8.56)

Table 3.4 (Continued)

Dependent variable: loan sizes from MVC in 2008			
Independent variables	**Model 1**	**Model 2**	**Model 3**
Professional and technical services	-5.3732***	-5.3752***	-5.3237***
	(-9.20)	(-9.21)	(-9.14)
Farm and general workers	-5.1088***	-5.1110***	-5.0273***
	(-8.34)	(-8.34)	(-8.20)
Other employees	-4.8421***	-4.8460***	-4.8197***
	(-13.72)	(-13.73)	(-13.68)
Unemployed	-3.9634***	-3.9648***	-3.9118***
	(-10.02)	(-10.03)	(-9.90)
Income and assets:			
Monthly income (THB 1,000)	-0.0369***	-0.0367***	-0.0364***
	(-2.95)	(-2.94)	(-2.94)
Land tenure	7.5729***	7.5892***	7.5534***
	(15.10)	(15.13)	(15.10)
Home business	2.0644***	2.0785***	2.0533***
	(7.03)	(7.08)	(6.99)
Other variables:			
Rural household	5.0638***	5.0607***	5.0604***
	(18.57)	(18.57)	(18.63)
Frequency of borrowing (since 2002)	0.4573***	0.4574***	0.4546***
	(13.73)	(13.72)	(13.67)
Constant	-8.1092***	-8.1403***	-8.0699***
	(-8.69)	(-8.73)	(-8.65)
/athrho	2.1932***	2.1932***	2.1910***
	(37.63)	(37.64)	(38.19)
/lnsigma	2.6758***	2.6755***	2.6745***
	(133.31)	(133.31)	(134.08)
rho	0.9754		
sigma	14.5240		
lambda	14.1670		
Log pseudo likelihood	-52,692.2	-52,688.5	-52,674.6
Wald chi2(20)	1,513.4***	1,544.1***	1,601.0***
Total observations	41,296	41,296	41,296
Left-censored observations	31,469	31,469	31,469
uncensored observations	9,827	9,827	9,827

Notes: Numbers in parenthesis indicate *z*-statistics.
***, ** and * represent level of significance at 99%, 95% and 90%.

Table 3.4 presents the results from Heckman selection model. The coefficients of all testing variables are significantly negative after the treatment of selection bias problem. These results indicate that the poor significantly get smaller loan sizes than the non-poor.

The coefficient of age is negative which indicates that MVC program targets households with younger heads. Rural households with female heads tend to get larger loan sizes. A larger household with low dependency ratio is more likely to receive a larger loan size. The loan sizes granted to landless farmers are significantly larger than that of other occupations. Finally, households with higher frequencies of borrowing since 2002 get larger loan sizes.

MVC does not target the rich. The results show that education and income are significantly negative to loan sizes. Households with members who work as professional and technical services get significantly smaller loan sizes. Less amounts of loan are also significantly granted to entrepreneurs.

The selection equation in Appendix B shows that the borrowing is significantly influenced by many household characteristics. It suggests that rural households of low-income and landless farmers who are familiar with other sources of credit are more likely to be borrowers.

3.5 Discussion

Empirical evidences have shown that MVC does not reach the poor as much as it should do. It does not target the rich either. Instead, it benefits the near poor. Results from both Tobit and Heckman selection model confirms that the poor at least do not get larger loan sizes than the non-poor. With the theoretical superiority of Heckman selection model over Tobit, it can be said that the poor tend to get even smaller loan sizes than the non-poor. A reason may be accordant to the explanation of Suriya (2011a) that the poor cannot apply for new credits because they do not repay previous credits and reach the credit limit.

MVC benefits the near poor even they are not the main target of the program. This may be because of the difficulty to separate the near poor and the poor. Suriya (2011a) described that many households that are in the second poorest quintiles of the village that he made the survey are near poor. This is because the

poverty line is not so high then many households may have income over the line but their living conditions are still not good. Therefore, it may be understandable that MVC targets the low-income households without caring much whether they are real poor or near poor. The program may believe that no matter what the low-income households are classified, all of them need the loan to improve their well-beings.

Clearly, MVC program does not target the rich. Households with higher income and education, especially those whose members work as entrepreneurs, professional and technical services get smaller loan sizes. Many development projects in Thailand were found that they are pro-rich when richer households benefit more than the poor, e.g. community-based development (Suriya, 2011a). The result from this study may thus save the MVC program from such the pro-rich allegation.

For other determinants, households with female heads are likely to get larger loan sizes. According to Coleman (1999), women who were household heads participate more actively than women who were not household heads. So they would need more loans for some income generating activities. Marital status of household heads is also a determinant. Single or separated household heads tend to get smaller loan sizes. They are viewed as lacking of credit worthiness; their households seem to be unstable because they cannot ask their couples to repay the loans (Coleman, 1999).

Households with more members have more labor forces that can find many sources of income. Therefore, it is more likely for them to receive larger amounts of loan. Furthermore, they can use more than one person in a household to borrow when the central regulation states that the loan size cannot exceed THB20,000 per borrower but not per household. As a results a larger family can get more than THB20,000 per household.

House owners are advantage to get larger amount of loan. Land and houses are good guarantees for the repayment. Additionally, households with higher frequency of borrowing tend to get larger amounts of loan. This is because of the good records and previous credit worthiness.

3.6 Conclusion

Although the principle of Microcredit for Villages and Communities (MVC) program is to provide loans to the poor, the empirical evidences in Thailand

show that MVC does not provide larger loan sizes to the poor. It benefits the non-poor instead. The results clearly show that the near poor get larger amounts of loan than the poor. However, MVC does not target the rich. Households with higher education and income tend to get smaller loan sizes.

Without separation between the poor and the near poor, MVC program in Thailand has been successful in providing loans to low-income households. Supporting the near poor is also good; the loan can prevent the near poor to fall into poverty again. However, the program can improve its performance by targeting more intensively to households which are poorer than their current clients. This strategy may lead the MVC program to reach the real poor who may need more loans to improve their well-beings than the near poor.