Chapter 7

Village Funds, Phones and Home-based Business in Thailand

The evidences of outreach performance of microcredit of village and urban community funds (MVC) or the village funds are provided in Chapter 2, 3 and 4. Sustainability performances are discussed in Chapter 5 and 6. This part of the work focuses on the impact performance of the MVC program.

The focus on the literatures have been on the direct impact of microcredit program on raising consumption, increasing and expanding small business, and reducing poverty. However, chapters 7, 8 and 9 try to show the matter in a different approach by using the propensity score matching technique. Rosenbaum and Rubin (1983) proved that matching on the propensity score is an appropriate means of overcoming the difficulty of determining the similarity of observations in a multidimensional space.

The purpose of this chapter is to evaluate the contributions of the MVC on the creation of a home-based business through phones. Having a phone offers enormous opportunities to overcome obstacles of geographic isolation while integrating people with the global and local markets.

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ABSTRACT

This study investigates the contributions of Village Funds' participation in the creation of a home-based business through phones at the household level. This study proposes a bivariate probit model of the joint determination of two binary choice variables, whether households have created home-based business in 2010 and whether households increased the number of phones/spend more for phone charges. The results confirmed that there is a simultaneous relationship between those two variables. Households with more number of phones and phone charge expenditures are more likely to have home-based business creation in 2010.

Keywords: microcredit, village fund, phone, home-base business, bivariate probit

JEL classification: G21, M13, C35

7.1 Introduction

The microcredit for village and urban community funds (MVC or Village Funds) is the largest government microcredit program in Thailand which has been in operation since 2001. The government allocated one million Baht (about $22,500)[1] per village to over 70,000 villages and urban community throughout the country. In 2010, the MVC program extended to 79,255 villages and had around 12 million members. The objectives of developing the local economy were applied by using loans for investment, consumption and welfare improvement. Empirical studies have shown an impact of MVC on the borrowers welfare, such as an increase in income, increasing in expenditures on durable goods, house repairs, vehicle repairs, spending

[1] In 2001, average exchange rate was $1 = THB 44.5

on health and education (Boonperm, Haughton, & Khandker, 2009; Chandoevwit & Ashakul, 2008; Kaboski & Townsend, 2012)

A small business including production, selling, and services also receive benefits from microcredit program. Previous studies have shown the importance of microcredit on investment in income generating activities, expanding small business, and business creation in developing countries (Nelson, 2011; Sievers & Vandenberg, 2007; Sigalla & Carney, 2012). However, only few studies have been made to investigate the impact of the village fund on small business start-up and on the business growth in Thailand. Data from Thailand's Socioeconomic Survey in 2009 show that 57.7% of total borrowers apply the loan for investment and most of them stated that their income had been increasing. This shows some evidence of impact with microcredit on the expanding of small business. Nelson (2011) and Kaboski and Townsend (2012) used the same panel data set of Thai villages at household level, which is known as the Townsend Thai Project. However, their results have shown a different picture about the impact of the village fund on household business. Nelson (2011) analyzed household business decisions in response to increased credit access by using data from 1999-2005. The results showed that increased access to credit stimulates non-agricultural business ownership to only among households in the middle wealth. For these households, an additional THB 1,000 of borrowing leads to 1.7% increase in the likelihood of operating a non-agricultural business, and an 18% increase in the stock of business capital. Kaboski and Townsend (2012) evaluated the impact of the village fund credit on investment by using data before (1997-2001) and post-program data (2002-2007). Surprisingly, they did not find any significant effect of the loan on business creation: both on business investment and agriculture investment.

Based on the mixed findings reported above, it lead to asking a key question: "*Can the village fund really benefit to small business in Thailand*"? Much of the focus of the literature has been on the direct impact of the village fund. However, this study tries to explain the matter in a different approach. We try to evaluate the impact of microcredit on home-based business through the phones. The Grameen bank of Bangladesh introduces "Village Pay Phones (VPPs)" to provide cellular mobile phones in rural area and have it operated under its microcredit program. The

results found that the business can turn telephones into production goods and it delivers more benefit to the poor than to the non-poor. The poorest also use phones in order to keep informed about the business environment. Phone owners have more opportunities to obtain new knowledge and become involved in income-generating activities (Bayes, 2001).

Having a phone offers enormous opportunities to overcome obstacles of geographic isolation such as reducing the transaction cost, and being integrated with the global and local markets by having increased access to market information (Aker, 2010; Baumüller, 2012; Donner & Escobari, 2010; Siriginidi, 2009). This study focuses on a small business where the office is located in the owner's home, otherwise referred to as a "home-based businesses". Thus, a relevant question in this setting is to see whether the extent to which changes in increasing phone use by increased microcredit access affect the household decisions of home-based business creation.

7.2 Literature Review

7.2.1 Home-based Business in Thailand

Home-based business in this study means a household use dwelling for business purposes, which includes working on the production, trade and services. It has a greater role after the Thailand Financial Crisis of 1997. The government stimulates the local production and economy to overcome unemployment from the crisis. Home-based business is a key factor in local economic development with the potential to foster an alleviation of poverty (Intaratat, Choosamay, & Yenjabok, 2006). It includes small and medium enterprises (SMEs), which is working at home, and home-based work[2]. Home Workers Protection Act B.E.2553 provides definition of home worker as "*a person or group of persons who agree with a hirer to accept work which is to be carried out at home*". The home-based worker does not produce the

[2] Home-based work involves: a) Garment, garment alterations and repairs; b) Embroidering; c) Knitting, hand knitting, machine knitting, crochet; d) Making artificial flowers; e) Weaving and dyeing of textiles, weaving tennis, basketball or fishing nets, carpet weaving, f) Making souvenirs, rolling cigarettes and incense sticks, g) Sewing and gluing shoes; h) Services (e.g., dressmaking, hair dressing, childcare); i) Food preparation/process, cake-making and decorating; j) Packaging supplies; k) Assembling electronic components, assembling gold chains; l) Wood carving, pottery; and m) Professional services, data processing (Intaratat, Choosamay, & Yenjabok, 2006).

goods directly for sale but must return them to the employer. The nature of home-base businesses does not use complicated technology and is normally using local knowledge to produce the desired goods or services.

The National Statistical Office conducted a survey on home work for the first time in 1999 subsequent for the year 2002, 2005, and 2007. The survey found that the amount of home-based work households has decreased after 2002 (Table 7.1). The Home Work Survey in 2007 indicated that most of them are women, married, less educated and were between the ages of 30 and 49 years. Most of their products are manufactured such as weaving, garment alterations, artificial flowers, and jewelry. Home-base work provides them primary or supplementary income with an average annual income THB 40,555 per worker. According to the 2009 Thailand's Socioeconomic Survey (SES) about 22 percent of total households use dwelling for business purposes.

Table 7.1: Number of Home-based Work Households in Thailand

Area/ Year	1999	2002	2005	2007
Number of households	226,473	406,473	348,965	294,290
Urban	*194,323*	*315,337*	*259,429*	*233,104*
Rural	*32,150*	*91,136*	*89,536*	*61,186*

Source: The Home Work Survey, National Statistical Office.

7.2.2 Phones and Small Business

Access to ICTs, including phone, depend on various factor such as age, gender, education and income. However, while ownership tends to be higher among wealthier users, income does not necessarily seem to be as a significant barrier to accessing more phones. People of all income levels are able to access mobile services (Samuel, Shah, & Hadingham, 2005). Intaratat et al. (2006), who studied homeworkers in Thailand, found that some of them have purchased their mobile phone units for THB 300 to 500 and generally spend around THB 150 to 250 per month for their pre-paid card phone. Mobile communication services in Thailand have expanded rapidly in recent years. Mobile phone density of 37 per 100 people in 2005

increased to 66 per 100 people in 2011. There are differences in mobile phone users between urban and rural areas. Table 7.2 shows the difference between both areas in Thailand. However, data provides a sign that access inequalities to phone have narrowed.

Table 7.2: Percentage of Population Aged 6 Years and Over Use Mobile Phones

Area/ Year	2005	2006	2007	2008	2009	2010	2011
Urban	51.7	56.0	61.1	65.7	47.1	72.2	74.8
Rural	30.2	35.2	41.0	47.1	51.5	57.0	62.0
Total	36.7	41.6	47.2	52.8	56.8	61.8	66.4

Source: The 2005-2011 Information and Communication Technology Survey on Household, National Statistical Office.

The nature of the phone is used for personal and business functions during the same day. A phone allows people to communicate and exchange information with convenience and comfort at a lesser. A phone provides some benefit for small enterprise such as reducing costs, increasing income, managing risk, and increasing productivity (Donner, 2010). Using the phones is much fast and cheaper for conducting some business affairs than being highly dependent on transportation. Donner (2010) reviewed the use of mobile phone by micro and small enterprise in developing countries. Recently, there is more evidence for the benefits of mobile use in small business. Phone use influences both the internal process and the network of relationships that is external of an enterprise. Potential impacts of phones increase the availability of information and network, expand input and output markets, and help to start a new business (Aker, 2010; Al-Azzam, Carter Hill, & Sarangi, 2012; Baumüller, 2012; Donner & Escobari, 2010; Samuel, Shah, & Hadingham, 2005). Empirical studies in South Africa and Egypt showed that mobile phones played an important role in small business start-ups, particularly for the service sector. Access to mobile phones has increased the range of services that can be offered, such as operating a 24-hour call-out service (Samuel, Shah, & Hadingham, 2005). Al-Azzam et al. (2012) showed some evidence of group lending in Jordan where the borrower households, who are equipped with phones, could have better access to market information at a

lower cost and, thus, a higher efficiency in their business. Final Report on "Homeworkers and ICTs: Thailand" indicated that all the homeworkers interviewed have used mobile phone in their business. Phones have helped create an environment that fosters home-based business (Intaratat, Choosamay, & Yenjabok, 2006).

7.3 Research Methodology

7.3.1 The Model

Green (1998) suggested a bivariate probit model as an appropriate technology for simultaneous equations model involving two binary choice variables which contains an endogenous binary variable in one of the equations. This study tries to model the contributions of Village Funds' participation to the creation of a home-based business via phones. The model is a recursive, simultaneous equations model. It can be explained as follows:

$$\begin{aligned} y_1^* &= (MVC)\lambda + X_1\beta_1 + \varepsilon_1, \\ y_2^* &= X_2\beta_2 + \gamma y_1 + \varepsilon_2 \end{aligned} \tag{7.1}$$

where y_1^* is the utility of increasing number of phones/ amount of phone charged expenditure while y_2^* stand for intention of starting a home-based business or entrepreneurs spirit. Both y_1^* and y_2^* are latent variables and depending on household's characteristics, X, and unobserved variable, ε. (ε_1 , ε_2) have a bivariate normal distribution with means (0,0), variances (1,1) and correlation ρ. *MVC* is dummy variable of Village Funds' participation. The bivariate probit model specifies the observed outcomes can write as follows:

$$y_1 = \begin{cases} 1 \;\; if \;\; y_1^* > 0 \\ 0 \;\; if \;\; y_1^* \le 0 \end{cases} \quad \text{and} \quad y_2 = \begin{cases} 1 \;\; if \;\; y_2^* > 0 \\ 0 \;\; if \;\; y_2^* \le 0 \end{cases} \tag{7.2}$$

where y_1 is a binary indicator of whether household have more number of phone/ amount of phone charged expenditure in 2010 while y_2 denotes whether household changing to have home-based business in 2010. We apply a maximum likelihood estimator with robust standard errors by using the Stata command *biprobit*.

7.3.2 Data and Summary Statistics

(a) Data Collection

The data in this study are from Thailand's Socioeconomic Survey in 2009 and 2010 conducted by the National Statistical Office. The survey interviewed 43,844 and 44,273 households, respectively, throughout the country. The municipal and rural households accounted for about 60 and 40 percent in both years. The data were collected every month throughout the year in the form of a questionnaire, consisting of household income (conducted only 2009) and expenditure. A special part of the village funds program has been included in the survey since 2009. The key inquiries raised in the questionnaire are the following - (1) "Last year, did any of household members have debt from village and urban community fund?" and (2) "Whether household used dwelling for business purposes or not?" Our focus is on the households which have changed to a home-based business in 2010. In other words, these were households that did not have any business purpose in 2009 suddenly converted their dwelling for business purpose (have a new home-based business) in 2010. However, the SES 2009 and 2010 data sets are not panel data. The work tries to overcome this limitation by constructing a pseudo panel data set using the propensity score matching technique.

The propensity score is the conditional probability of receiving a treatment given pretreatment characteristics such as household characteristics [3] (Appendix D). We use an algorithm developed by Becker and Ichino (2002) and apply the Logit model to estimate the propensity score (Appendix E). This estimate is then used to match treated (households from SES 2009) and comparison (households from SES 2010) households by creating blocks that contain households with similar propensity scores (balancing property).

In the next step, we employed the nearest neighbor matching technique to investigate the contributions of Village Funds' participation to new home-based business. We match two households with the closest propensity score, one form households which dwelling is not used for business purpose in 2009 and the other from households in 2010. The sample was based on 32,177 households where

[3] After dropping observations with missing data, the sample consists of 41,296 households in 2009 and 41,850 households in 2010.

dwelling was not used for business purpose in 2009. Those households were divided into two groups - borrower and non-borrower households. For the first matching, we matched between 7,511 borrower households where dwelling was not used for business purpose in 2009 and 9,576 borrower households in 2010. For the second matching, we matched between 24,666 non-borrower households where dwelling was not used for business purpose in 2009 and 32,274 households in 2010. The data descriptions after matching are summarized in the next section.

(b) Data Description

Pseudo panel data from matching technique indicated that 5,936 households changed to have home-based business in 2010, whereas 26,241 households still does not have home-based business. The household characteristics are summarized in Table 7.3.

Table 7.3: Statistical Summary of Variables Using in Bivariate Probit Model

Variables	Changing to have home-based business in 2010		Still not have home-based business in 2010	
	Mean	Std. Dev.	Mean	Std. Dev.
More number of phone in 2010	0.474	0.499	0.378	0.485
More phone's expenditure in 2010	0.543	0.498	0.457	0.498
Borrowed from VF in both years (yes=1)	0.264	0.441	0.227	0.419
Age of household head in 2009	48.304	12.934	51.514	15.088
Women household head in 2009 (yes=1)	0.295	0.456	0.351	0.477
Education of household head in 2009 (years)	7.675	4.489	7.605	4.646
Marriage of household head in 2009 (yes=1)	0.740	0.439	0.677	0.468
Household size in 2009 (persons)	3.302	1.635	3.076	1.593
Dependency ratio in 2009	0.340	0.319	0.376	0.357
Monthly income in 2009 (THB 1,000)	24.071	56.762	21.885	32.265
Land tenure in 2009	0.751	0.432	0.757	0.429
Number of cars in 2009	0.437	0.702	0.403	0.663
Number of motorcycles in 2009	1.127	0.839	1.128	0.886
More motorcycles in 2010	0.356	0.479	0.315	0.465
Rural household in 2009	0.378	0.485	0.403	0.491
Total observations	5,936		26,241	

7.4 Results and Discussion

The study separated the model into 2 models; each model contains different variable of phone. Model 1 considers whether household increase number of phones in 2010 while model 2 focus on whether household increase amount of phone charged expenditure in 2010. According to determinants of changing to have the home-based business in 2010, only the phone variable (more number of phones and more amount of phone charged expenditure) is assumed an endogenous variable. All other regressors are assumed exogenous where as dummy variable for more number of motorcycles in 2010 is used as a controlled variable.

Table 7.4 presents the results from bivariate probit model. The Wald test is statistically significant at 99%. It implies that a bivariate probit model is appropriate to simultaneously determined household decision to create home-based business and increasing number of phone/amount of phone charged expenditure. The results indicate that households participating in the Village Fund have positive effects on phone variables. Borrower households tend to increase both number of phone and phone charged expenditure. In addition, phones also have positive effect on household changing to have home-based business in 2010. This evidence shows the contributions of Village Funds' participation to the creation of home-based business via phones.

Table 7.4: Bivariate Probit Analysis for Determinants of Home-based Business and Phones

Dependent variable	**Model 1**		**Model 2**	
	More number of phone	*Home -based business*	*More phone's expenditure*	*Home -based business*
More number of phone in 2010		0.9492***	1.3996***	
		(0.144)	(0.017)	
More phone's expenditure in 2010				0.5545***
				(0.033)
Borrowed from VF in both years	0.1121***		0.0436**	
	(0.019)		(0.020)	
Age of household head in 2009	-0.0022***	-0.0103***	0.0002	-0.0114***
	(0.001)	(0.001)	(0.001)	(0.001)

Table 7.4 (Continued)

Dependent variable	Model 1		Model 2	
	More number of phone	*Home -based business*	*More phone's expenditure*	*Home -based business*
Women household head in 2009	-0.0780***	-0.0663***	0.0207	-0.0916***
	(0.018)	(0.020)	(0.019)	(0.020)
Education of household head in 2009	-0.0081***	-0.0083***	-0.0078***	-0.0104***
	(0.002)	(0.002)	(0.003)	(0.002)
Marriage of household head in 2009	-0.0928***	0.0851***	-0.0022	0.0567***
	(0.019)	(0.022)	(0.021)	(0.021)
Household size in 2009	-0.1417***	0.0962***	-0.0855***	0.0753***
	(0.006)	(0.008)	(0.006)	(0.006)
Dependency ratio in 2009	0.3328***	-0.1515***	0.2424***	-0.0964***
	(0.026)	(0.034)	(0.028)	(0.029)
Monthly income in 2009 (THB 1,000)	-0.0051***	0.0009***	-0.0035***	0.0008***
	(0.001)	(0.000)	(0.001)	(0.000)
Land tenure in 2009	-0.0986***	0.1402***	-0.0496**	0.1228***
	(0.020)	(0.023)	(0.022)	(0.023)
Number of cars in 2009	-0.1380***	0.0822***	-0.0894***	0.0647***
	(0.016)	(0.015)	(0.018)	(0.015)
Number of motorcycles in 2009	-0.1229***		0.0072	
	(0.010)		(0.010)	
More motorcycles in 2010		0.0826***		0.1056***
		(0.019)		(0.018)
Rural household in 2009	0.1353***	-0.1579***	0.0692***	-0.1400***
	(0.016)	(0.018)	(0.017)	(0.018)
Constant	0.5895***	-1.0682***	-0.2871***	-0.8411***
	(0.047)	(0.098)	(0.051)	(0.055)
Number of observations	32,177		32,177	
AIC	70,040.14		63,909.74	
Log pseudo likelihood	-34,993.07		-31,926.87	
Wald chi2	3,450.21***		10,701.93***	
Wald test of exogeneity: chi2 (1)	16.66***		103.00***	

Notes: Numbers in parenthesis indicate robust standard errors.
***, ** and * represent level of significance at 99%, 95% and 90%, respectively.

Moreover, results from Table 7.4 indicate that a young man, who is a household head, with a low education, and living in a rural area with low endowment (low-income and few assets), are more likely to increase their number of phones and phone charged expenditure. It may be explained by the mobile phones which are widely used in urban society and is expanding to rural areas. This can be seen from the proportion of mobile phone users in the urban area that has been increased from

51.7 percent in 2005 to 74.8 percent in 2011. In the rural areas, such proportion had been increased from 30.2 in 2005 to 62.0 in 2011 (Table 7.2). In the present period, the mobile phone is inexpensive and easy to access.

Education is significantly negative of phone variable; this indicates that a low level of education has implications on the use of phones. Some studies identify education as an obstacle factor for information access due to mobile phone menus often written in English (Okello, Okello, & Adera-Ofwona, 2009). However, it may not be such a problem in Thai because it is provided in the Thai language.

Male household heads who are married, having a large household size but small dependency ratio, a high income and more assets (land and vehicles), and who live in urban areas, are more likely to create home-based business in 2010. Younger household heads are more likely in willing to take risks, as well as being more receptive to investing in a new business. The education of the household head has a significantly negative impact on probability of change to have home-based business. Raijman (2001) suggest that household resources play an important role in the process of business creation. Moreover, household members contribute an unpaid labor force that reduces the cost of business operation. The dummy variable of whether household had increased number of motorcycles in 2010 is positive and significant in two models. It indicates that those households are more likely to have home-based business in 2010.

7.5 Conclusion

To deal with the expected endogeneity problem between the phone and home-based businesses, a bivariate probit model was employed as the tool for this work. Results suggest that increasing phone use and having home-based business are related. Households participated in the Village Funds are more likely to have more phones and more phone charge. Moreover, phones and phone charge expenditure also explained the creations of home-based business. This finding agrees with Bayes (2001) who indicated that "Telephone should be treated not only as a consumer good, but also as a production good, especially in poor rural areas." Thus, loans for the purchasing mobile phones have been seen as a consumption loan, and may also increase the household income through home-based business. It can be associated to

the point that consumption loans differ from investment loans, where the creation of income activities that have negative effects on the repayment may not be entirely correct.

Phones provide benefit to small businesses in terms of increasing the probability of home-based business. Government policy has an important role to play in improving a comprehensive communication system. The public and small businesses, especially the poor in remote rural areas, will benefit from the policy of development of information and communication technology.

This study tried to construct a pseudo panel data between households which did not used dwelling for business purpose in 2009 and households in 2010 with similar characteristics by using the propensity score matching technique. Further research should be conducted with a real panel data to examine that these results are consistent and for analyzing the phone use by home-based business in detail. Finally, the results in this study relied on a bivariate normal distribution. It is needed to apply the copula bivariate probit model that allowed for correlation between the two latent errors without imposing joint normality.