Chapter 8

Village Funds, Phones and Poverty Reduction in Thailand

Nowadays, information and communication technology (ICT), particularly mobile phones, play an important role to improve communication. Literatures presented in the United Nations Conference on Trade and Development showed that mobile phones make a positive contribution to the livelihood of people as well as in helping them escape from poverty. The rural poor can get information about the climate, disease, health, education and agricultural technologies from the phone. The significant impact of mobile phone on poverty reduction is highly important from a policy perspective. The purpose of this chapter is aimed at analyzing the effects of village funds on poverty reduction through mobile phones among the poor in Thailand.

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ABSTRACT

This study is aimed at analyzing the effects of village funds on poverty reduction through mobile phones among the poor in Thailand. To deal with the expected endogeneity problem between number of phones and household poverty, a probit regression with instrumental variables (ivprobit) was employed as the tool for this work. The results demonstrate that the Village Funds has contributed to an increase number of mobile phones in the households. In addition, it has some evidence indicating that more phones can help the poor to escape from poverty.

Keywords: microcredit, village funds, phone, poverty reduction, ivprobit

JEL classification: G21, I32, R20

8.1 Introduction

On October 2010, the United Nations Conference on Trade and Development (UNCTAD) published the Information Economy Report which brought attention to the role of information and communication technologies (ICTs) and enterprises in combating poverty. Mobile phones in enterprises make a positive contribution to the livelihood of people who are classified as poor and uneducated as well as being the recipients to poverty reduction. Therefore, the use of a mobile phone is an alternative factor for achieving The Millennium Development Goals. The report concluded that the main potential benefits of ICT use, especially in a two way communication by mobile phone, are in reducing information search, diminishing transaction costs, and improving communications within the supply chains and overall market (United Nations, 2010a).

Moreover, the microfinance institutions have an important role in dealing with mobile phones and the poor. Developing countries have electronic payment

services for transferring small amounts of money to provide benefit for those with limited or no access to banking through mobile phones; an example is the M-PESA in Kenya and M-Paisa in Afghanistan (United Nations, 2010a). The Grameen Bank of Bangladesh introduced cellular mobile phones, Village Pay Phones (VPPs), to be operated under its microcredit program (Bayes, 2001). Bayes (2001) showed empirical results of village pay phones in the economic, poverty and food situation, and socio-cultural effects in rural Bangladesh.

In Thailand, the government established microcredit for the village and urban community funds (MVC or Village Funds) program as a part of a poverty alleviation policy in 2001. It allocated the amount of one million baht per village as a community fund for consumption and investment. Even the Village Funds does not provide mobile payment services directly. There are some evidence about the relationship between microcredit program and mobile phones. Boonperm et al. (2009) used propensity score matching techniques to evaluate the effect of microcredit of village and urban community funds in Thailand and found that it increased the household expenditure on ICTs; for example, phone ownership among those borrowers was 5.7% higher than non-borrowers in 2004. Household expenditure on ICTs such as telephone, computer, and internet was an interesting factor in dealing with poverty reduction.

Having a phone offered enormous opportunities to overcome obstacles of geographic isolation by reducing the transaction cost, being integrated with the global and local markets, and improving quality of life (Bhavnani, Chiu, Janakiram, & Silarszky, 2008; Siriginidi, 2009). This study will examine the changes in the number of phones on increased microcredit access and whether such strategies have affected the poverty status of the poor household. To carry out this procedure, we constructed a pseudo panel data from the Thailand Socioeconomic Survey in 2009 and 2010. From there, the method applied the probit regression with instrumental variables (ivprobit) to consider the relationship between microcredit access, changes number of phones, and poverty status change.

The following section contains a background of mobile phone uses in Thailand and literature about phones and poverty reduction. Section 3 addresses

empirical methodology, data and summary statistics. Section 4 provides our empirical results and discusses some important issues and conclusion in section 5.

8.2 Literature Review

8.2.1 Background of Mobile Phone Uses in Thailand

Data from annual report in 2010 commissioned by the National Broadcasting and Telecommunications Commission (NBTC) showed that the ratio of the number of mobile phone per total population increased rapidly in Thailand, from 28 percent in 2002 to 107 percent in 2010. This rapid growth was made possible through falling prices of mobile phone and calling rates, the introduction of pre-paid system, and the expansion of networks into rural areas. The average calling rate in 2009 and 2010 were 0.59 and 0.57 THB/minute, respectively (NBTC, 2010).

There were 5 mobile providers in the market; AIS, DTAC, DPC, TRUE MOVE, and HUTCH. In 2009, there were 65 million subscribers of mobile telephone services and increase to 71 million subscribers in 2010 (NBTC, 2010). The payment system is divided to prepaid and postpaid. Eighty nine percent of total subscribers in 2010 used the prepaid system, such an explanation for this phenomenon could be on the prepayment that allows for a better expenditure control.

In addition, households' survey conducted by the National Statistical Office provides the number of mobile phones use in households according to economic status in 2009 which is shown in Table 8.1.

Table 8.1: Number of Mobile Phones Use in Households According to Economic Status, 2009

Number of phones	Poor		Non-poor		Total	
	Households	%	Households	%	Households	%
None	584	28.09	3,452	8.80	4,036	9.77
One	1020	49.06	14,619	37.28	15,639	37.87
Two	346	16.64	12,802	32.64	13,148	31.84
More than two	129	6.20	8,344	21.28	8,473	20.52
Total	2,079	100.00	39,217	100.00	41,296	100.00

Source: calculated from Thailand's Socioeconomic Survey 2009

Among the poor, 28.09 percent cannot gain access to mobile phones and most of them (49.06 percent) only have one number per household. While non-poor households appear in that figure only 8.8 percent cannot gain access to mobile phones.

Moreover, the survey found that respondents spent about 6.5 percent of total monthly consumption expenditure on mobile phones. The poor and non-poor households' expenditure on phones are on an average of 5.2 and 6.7 percent respectively. Table 8.2 shows the average expenditure on communication in 2009. It shows that the poor household spent about 206.33 baht per month for communication, while non-poor spent three times more than the poor. However, Agüero et al. (2011) applied the Engle law and income elasticity to evaluate expenditure patterns on mobile phone services at the bottom of the pyramid in six emerging Asian countries; Thailand was included in the study. The results showed an estimation that was consistent with the Engle law. Also, the share of mobile expenditure decreases as personal income increases, thus mobile phone service exhibits the characteristics of a necessary service in economic terms.

Table 8.2: Average Household's Communication Expenditures in 2009

Expenses (unit: baht per month)	Poor	Non-poor	Total
Communicated equipment i.e. telephone, mobile phone, facsimile (include service cost)	149.52 *(27)*	327.60 *(1,947)*	325.16 *(1,974)*
Telephone rate and service	203.33 *(1,460)*	558.99 *(36,419)*	545.29 *(37,879)*
Membership / internet services	79.17 *(12)*	465.99 *(5,063)*	465.08 *(5,075)*
Other (e.g., stamp, shipping, writing supplies)	10.00 *(1)*	129.69 *(390)*	129.38 *(391)*
Total communication expenditures	206.33 *(1,463)*	641.34 *(36,495)*	624.57 *(37,958)*

Source: calculated from Thailand's Socioeconomic Survey 2009
Notes: Numbers in parenthesis indicate number of households with costs.

8.2.2 Phones and Poverty Reduction

Several studies have found that access to ICTs depends on various factors, such as education and income (Tengtrakul & Peha, 2011; Torero & Braun,

2006). Thus, the poor seems to have limited access to modern telecommunication technologies such as computer and internet. In the case of having a phone, however, the costs of using the phones tend to decrease. The poor have an ability to pay and obtain benefit from using the mobile phones. Tengtrakul and Peha (2011) used a variety of demographic and geographic variables to predict penetration of ICTs in rural Thailand. The results found that the important predictors of mobile phone are the penetration of television and radio, income, the number of pickup trucks per 100 households, and development level of villages.

Literatures have shown the potential of mobile phone to bring in opportunities and growth, especially in achieving the millennium development goals (Siriginidi, 2009). Bhavnani et al. (2008) studied the role of mobile phone in sustainability reduction in developing countries and provided a literature of direct, indirect, and intangible benefits of a mobile phone. First, the direct benefits of the mobile phone industry to macroeconomic are generating the GDP, creating job opportunities, increasing productivity, and producing taxation revenue. Second, indirect benefits are on economic and social aspects. The uses of mobile phone benefit on enhance entrepreneurship, reduce information asymmetries or market inefficiencies, and substitute transportation. Finally, intangible benefits promote the growth of culture, society, and social ties. The World Bank also identifies the mobile phone applications to promote agricultural and rural development including better access to information (especially in agriculture, health), better access to extension services, and better access to microfinance; including microcredit, saving, insurance and money transfer (World Bank, 2012).

Bayes (2001) evaluated the economic effects of "Village Pay Phones (VPPs)", and on Grameen Bank's innovative program which leased mobile phones to successful members. The study found that the VPPs increased the productivity and profitability of small farm, empowerment and increased social status of phone-leasing women and their households. Baumüller (2012) analyzed the delivery of services through mobile phones or m-services and found that it could help in overcoming the obstacles to agricultural technologies adoption by facilitating access to information, financial services, and input and output markets in developing countries. Jensen (2007) investigated the impact of mobile phones on market

performance and welfare in the fisheries sector in India. The results made known that mobile phones reduce price dispersion, eliminate waste and increase social welfare through higher profits, and lower consumer price.

8.3 Research Methodology

8.3.1 The Model

The probit regression with instrumental variables (ivprobit) will be used to analyze the effect of phones on poverty reduction. The independent variable in this model, which is the number of phones changed during 2009 and 2010, may be influenced by the dependent variable, which is the poor household in 2009 becoming non-poor in 2010. This may cause the outcome to be in a recursive model as well as an endogeneity problem. Moreover, due to the fact that number of phones change is a continuous variable and poverty status change is a binary variable, two stage least square (2SLS) that estimates two OLS regressions is not appropriate (Wooldridge, 2002). The probit regression with instrumental variables corrects such problems. Our empirical work is focused on

$$Poverty = \alpha_0 + \alpha_1 Phone + \sum_{i=2}^{M} \alpha_i X_i + \sum_{h=M+1}^{R} \alpha_h H_h + \varepsilon_1 \qquad (8.1)$$

$$Phone = \beta_0 + \beta_1 Poverty + \sum_{j=2}^{N} \beta_j Z_j + \sum_{k=N+1}^{Q} \beta_k H_k + \varepsilon_2 \qquad (8.2)$$

where *Poverty* is poverty status change which the poor household in 2009 turning to be non-poor in 2010 is classified as one, otherwise it is zero. *Phone* is number of mobile phones change during 2009 and 2010. *X* is the pure determinants only of poverty status change whereas *Z* is the pure determinants only of number of phones change, and *H* is the joint determinants both of poverty status change and number of phones change. ε_1 and ε_2 are error term.

To estimate the poverty status change and for selecting a good instrumental variable, we followed the method suggested by Suriya (2011a).

Step 1. Estimation of *Phone* using an OLS regression model includes all exogenous variables and regressors that determine *Phone* but not *Poverty, Z.* Variables that are correlated with the *Phone* will be chosen to be the instrumental variables. In this study, we focused on an important role of the Village Funds to

encourage phone expenditures and for increasing the number of mobile phones. Therefore, the Village Fund is one of the candidates.

Step 2. Estimation of *Poverty* using a probit regression model including all exogenous variables, all candidates for instrumental variables, and regressors that determine *Poverty* but not *Phone, X,* to select the instrumental variable. Those candidates which are significant in this model, *H,* will be excluded from the list of instrumental variables.

Step 3. Estimation of *Phone* again by using an OLS regression model includes only variable *X* and *Z* as regressors to obtain the predicted values of the endogenous variable, *Phone_hat*. It is an instrumented variable.

Step 4. Estimation of *Poverty* again by using a probit regression model includes the instrumented variable, *Phone_hat,* and all exogenous variables to estimate the probability of getting out of poverty.

8.3.2 Data Collection

The data used in this study comes from Thailand's Socioeconomic Survey (SES) in 2009 and 2010 that was conducted by the National Statistical Office. The survey interviewed 41,296 and 41,850 households, respectively. The data consist of income (only SES 2009) and expenditure at household level. The household characteristics are shown in Appendix D. Since our focus is on poverty status change, we looked at the poor households in 2009 turning to be non-poor in 2010. However the SES 2009 and 2010 data sets are not the panel data. From there, we tried to overcome this limitation by constructing a pseudo panel data set using the propensity score matching technique which was developed by Becker and Ichino (2002). The Logit estimators for the propensity score are shown in Appendix E.

The sample includes of 2,079 poor households in 2009. For the purpose of this study, we considered two groups of poor households which are borrower and non-borrower households. Out of the total poor households, 780 households (37.5%) borrowed from the Village Fund and 1,299 households (62.5%) did not borrow at all. Our objective was to match two similar household's characteristics with the closest propensity score, one from the poor households in 2009 and the other households in 2010 (form both poor and non-poor). We matched 780 poor borrower households in 2009 with 9,576 borrower households in 2010 and

1,299 poor non-borrower households in 2009 with 32,274 non-borrower households. Data descriptions after matching are summarized in next section.

8.3.3 Data Description

Pseudo panel data from matching technique indicated that 1,883 households turned to be non-poor in 2010, whereas 196 households were still poor in 2010. Summary statistics for all variables using the probit regression with instrumental variables are presented in Table 8.3.

Table 8.3: Statistical Summary of Variables Using in the IVPROBIT Model

Variables	Turning to be non-poor in 2010		Still poor in 2010	
	Mean	Std. Dev.	Mean	Std. Dev.
Change in the number of phones	0.666	1.436	0.122	1.153
Borrowed from VF in both years (yes=1)	0.371	0.483	0.418	0.495
Age of household head in 2009	56.296	15.115	54.765	14.631
Women household head in 2009 (yes=1)	0.285	0.451	0.311	0.464
Education of household head in 2009 (years)	4.602	1.945	4.582	1.989
Marriage of household head in 2009 (yes=1)	0.747	0.435	0.760	0.428
Change of household size (persons)	-1.051	2.316	0.046	2.500
Change number of dependents (persons)	-0.959	1.790	0.204	1.919
Monthly income in 2009 (THB 1,000)	7.708	5.118	7.342	5.293
Land tenure in 2009	0.917	0.277	0.954	0.210
Number of cars in 2009	0.033	0.180	0.046	0.210
Number of motorcycles in 2009	0.932	0.764	0.913	0.707
Number of mobile phones in 2009	1.031	0.917	1.056	0.866
Rural household in 2009	0.530	0.499	0.520	0.501
Poverty gap	0.168	0.130	0.193	0.141
Total observations	1,883		196	

8.4 Results and Discussion

Table 8.4 presents the results from the determinants of changing number of mobile phones (Step 1) and the probit regression with instrumental variables (Step 4). The results from the second column (Step 1) indicate that households participate in the Village Fund have positive effects on phone variables. Borrower households tend

to increase number of mobile phones. They seemed to take the credit for a steep rise in mobile-phone ownership. Larger household sizes tend to increase number of mobile phones.

Table 8.4: Estimation Results for the Effects of Phones on Poverty Status Change Using IVPROBIT Regression

Variables	***Step 1: Phone (OLS)***		***Step 4: Poverty (ivprobit)***	
	Mean	Robust Std. Dev.	Mean	Robust Std. Dev.
Change in the number of phones			0.0886*	0.048
Borrowed from VF in both years (yes=1)	0.0969**	0.046		
Age of household head in 2009	-0.0006	0.002	0.0004	0.003
Women household head in 2009 (yes=1)	-0.0078	0.060	-0.1330	0.105
Education of household head in 2009 (years)	-0.0067	0.013	-0.0022	0.024
Marriage of household head in 2009 (yes=1)	-0.0292	0.065	-0.1707	0.119
Change of household size (persons)	0.3365***	0.018	-0.0381	0.025
Change number of dependents (persons)	-0.2180***	0.019	-0.1629***	0.031
Monthly income in 2009 (THB 1,000)	0.0331***	0.005		
Land tenure in 2009	-0.1531*	0.087	-0.3716**	0.180
Number of cars in 2009	0.2192*	0.126		
Number of motorcycles in 2009	0.1755***	0.035		
Number of mobile phones in 2009	-0.8532***	0.028		
Rural household in 2009	0.0436	0.046	0.0690	0.082
Poverty gap			-1.0577***	0.296
Constant	1.3742***	0.178	1.8200***	0.303
R-squared	0.5172			
Pseudo R^2			0.0725	
Observations	2,079		2,079	

Notes: ***, ** and * represent level of significance at 99%, 95% and 90%, respectively.

Mobile phones are widely used in Thai society both urban and rural area. This can be seen in the data from Thailand National Statistical Office which indicated that the percentage of population aged 6 years and over use mobile phones: this is an increase from 36.7 percent in 2005 to 66.4 percent in 2011. Reduction in number of dependents will allow household resources to spend more in other activities; including

the chances of having more phones. Phone ownership tends to be higher among wealthier users. Households that already have large number of mobile phones were less likely to increase the phones.

Change number of phones is significant in *ivprobit* model. The result ensures that mobile phones can raise the probability of escaping from poverty. Poor borrower households with more number of phones have a higher probability in turning to be non-poor. Having a phone makes a positive contribution to the livelihood of people who are classified as poor (Aker, 2010; Baumüller, 2012; Siriginidi, 2009). Household may use the phone to create job opportunities, as well as increasing their productivity. Moreover, the change number of dependents, land tenure, and poverty gap are also significant for explaining poverty status change. Household with less number of dependents has high probability turn to be non-poor. Negative signs of poverty gap indicate that a poor household with narrower gap has a larger possibility to cross over the poverty line.

8.5 Conclusion

Empirical results have shown that households participating in the Village Fund have positive effects on phones. In addition, phones also have a positive effect on poverty status change. This evidence shows the contributions of the Village Funds' participation in the creation of poverty reduction via phones. With an exception in increasing the values of human capital (such as education and health and providing the better opportunities of employment and access to market), mobile phone service is an alternative strategy for government in alleviating poverty. Therefore, if policymakers are interested in reducing poverty, the results in this study suggests that they should emphasize on people having access to ICT and providing them with information through ICT; especially with phones.

This study attempted to construct a pseudo panel data between poor households in 2009 and households in 2010 with similar characteristics by using propensity score matching technique. Further research should be conducted with a real panel data to examine these results to see if they are consistent and to analyze phone use by households in intricate detail.