GOVERNMENTAL MICROCREDIT AND POVERTY REDUCTION: EVIDENCE FROM RURAL VIETNAM

By

Thi Tuyet Trinh Pham

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfilment of the requirements
for the degree of

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Committee in charge:

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ABSTRACT

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The thesis aims to assess the poverty targeting of the preferential credit programme for the poor from Vietnam Bank for Social Policies and its impacts on household welfare, in terms of income from profits per capita, consumption expenditure per capita, and food consumption expenditure per capita, in rural areas of Vietnam. Using data from Vietnam Household Living Standards Surveys from 2004 to 2012, the study finds that the programme has not sufficiently targeted the poor, with low coverage rate and high leakage rate. Likewise, the programme seems not so pro-poor, that is, it fails to target the poorer strata of the rural households. To examine the impacts of the programme, the study employs household and commune fixed-effects to control for unobserved and time-invariant attributes that may both affect the outcome variable and the participation status of the households. The study also uses an instrumental variable which is access to credit to control for other endogeneity problems. With three different data panels constructed: 2004-2006, 2006-2008, and 2010-2012, estimation results suggest that the microfinance programme has statistically significant positive impact on household income from profits for the first period. The impacts, however, turned out to be insignificant in the latter two periods 2006-2008, and 2010-2012, even though the coefficients still suggest a positive effect. The study also finds no evidence on the impacts of participating in this programme on other household welfare proxies, including consumption expenditure, and food consumption expenditure.

Dedicated to my beloved family.

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1. INTRODUCTION

1.1. Background

Over the past few decades, microfinance[1] has gained increasing interest from policy makers and scholars. Microfinance institutions appear to play significant roles in improving access to finance, positively contributing to the global poverty alleviation. Increasing attention has been even more drawn to microfinance since Muhammad Yunus, the founder of Grameen Bank, the pioneering Bangladeshi credit delivery system that provides banking services targeted at the rural poor to stimulate business activities and reduce the poverty, received the Nobel Peace Prize in 2006.

In Vietnam, microfinance has been developing since the *Doi moi*[2] (Renovation) in 1986. However, there was no legal and regulatory framework for microfinance institutions until 2010, when the Credit Institution Law was enacted, integrating microfinance into the formal banking system. As of now, the microfinance system consists of three sectors: formal sector (e.g. Vietnam Bank for Social Policies, Vietnam Bank for Agriculture and Rural Development, People's Credit Funds), semi-formal sector (e.g. socio-political organizations, non-government organizations), and informal sector (e.g. friends, relatives, money lenders).

Regarding formal sector in general and state-owned microfinance institutions in particular, the Vietnamese Government has introduced several microcredit programmes, mainly through the Vietnam Bank for Social Policies, aiming to ease the credit constraints of poor rural households and provide them with capital inputs for production activities, life amelioration and poverty reduction, contributing to the implementation of the 'National Target Programme on Hunger Elimination, Poverty

[1] In this study, microfinance and microcredit are used interchangeably. However, in literature, microfinance also refers to different financial services such as savings, insurance, etc.

[2] Doi Moi (Renovation) was mandated in December 1986 by the Vietnamese Government with the purpose of shifting from a centrally-planned economy to a market oriented one, inside the framework of state regulations.

Alleviation and Employment' (Vietnam Bank for Social Policies, 2003a). Despite the importance of these programmes, questions regarding poverty targeting and their impacts have been discussed by only few studies. Generally, among different programmes, the Vietnam Bank for Social Policies' lending-to-the-poor programme is found not to be very pro-poor in terms of targeting, but the programme has improved household welfare, business production, and reduced the poverty rate of the participants (Cuong, 2008; Lensink & Pham, 2012).

To contribute to the ongoing discussion about microfinance, particularly, governmental microcredit in Vietnam, the study aims to examine the extent to which the governmental lending-to-the-poor programme has targeted the poor, and its impacts on household welfare and poverty reduction in rural areas of Vietnam, using data from Vietnam Household Living Standards Surveys 2004, 2006, 2008, 2010, and 2012.

The study is structured into 6 sections. The remaining part of section 1 provides an overview of microfinance system in Vietnam, and the Vietnam Bank for Social Policies. Section 2 reviews the relevant literature of microfinance in general, and microfinance in Vietnam in particular. Section 3 explains the nature of the data. Section 4 presents the analysis and discussion on poverty targeting of the programme. Specifically, the study first compares the socio-economic characteristics of the programme beneficiaries and non-beneficiaries to find whether the average beneficiaries are poorer than the non-beneficiaries. The study then calculates the inclusion error rate or leakage rate of the programme, as well as the coverage rate, the credit amount and average interest rate for eligible and ineligible groups. Finally, by classifying the rural households into 5 quantiles, in terms of household income per capita, consumption expenditure per capita, durable score, and socio-economic score,

the study was able to examine whether the beneficiaries belong to the poorer strata of the society. Section 5 presents the estimation strategy, data sets, empirical results and discussion on the impacts of the programme on household welfare and poverty reduction. To be more specific, in this section, the study estimates the impact of credit on income from profits, consumption expenditure and food consumption expenditure across households using fixed-effects model, with and without instrumental variable. The last section concludes the study and makes policy recommendations.

1.2. Overview of Microfinance in Vietnam

The economic reform initiated in 1986 has transformed Vietnam towards a market-oriented economy with outstanding achievements in economic growth (Dao, 2001; Dao, 2002). The country has remarkably reduced its poverty incidence from 58% in 1993 to less than 6% in 2014. However, rural areas seem to be lagged behind, with disproportionately high poverty rate compared to that of urban areas: the rural poor accounted for over 90% of total number of poor households of the country (Ministry of Labour, War Invalids and Social Affairs, 2015). Likewise, there was only about 11% of the poorest 40% of the population that has an account in a formal financial institution in 2011 (Demirgüç-Kunt & Klapper, 2012), which indicates the importance of ensuring provision of financial services to the rural poor for the purpose of improving business production and living standards, and reducing poverty.

Initially, the microfinance system in Vietnam was mainly driven by the Government in the 1980s and 1990s, as a result of the economic reform and the opening up to foreign market. The Government's decentralization, which delegated greater autonomy to regions, has favoured the growth of the microfinance in the country, leading to a complex system which has been characterized by the coexistence of state-driven and market-based approaches with three sectors: formal sector, semi-

formal sector, and informal sector (Asian Development Bank, 2014). In 2010, the Credit Institution Law was enacted, being considered as a milestone that integrates microfinance into the formal banking system.

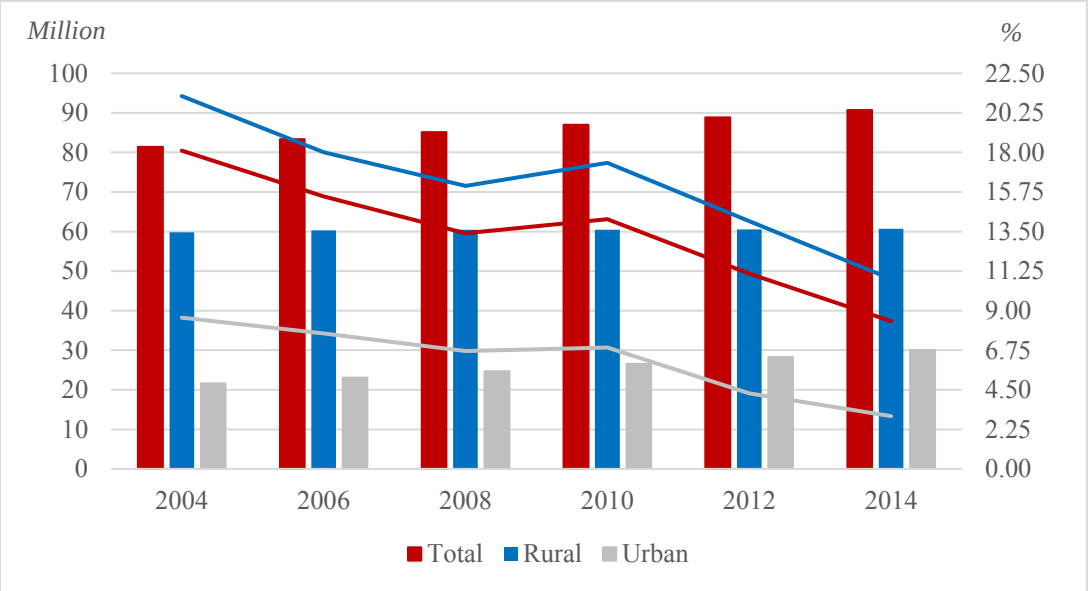

Figure 1.1: Population and Poverty Rate of Vietnam over the 2004-2014 period
Source: General Statistics Office of Vietnam

The formal sector plays important roles in the microfinance system, constituting a large proportion in the market share. By the end of 2013, the two main institutions: Vietnam Bank for Agriculture and Rural Development, and Vietnam Bank for Social Policies collectively accounted for over 80% of total microfinance clients and total outstanding loans, of which, Vietnam Bank for Social Policies alone constituted 67% of total borrowers and 65% of microloans outstanding (Asian Development Bank, 2014). Besides, the formal sector also includes People's Credit Funds, whose network has been gradually set up since 1993, following the member-based and member-owned model, with the main function of mobilising savings from its members and provide credit to households and individuals (Wolz, 1999; Putzeys, 2002). As of 2014, there are 1,130 member-based PCFs (Asian Development Bank, 2014).

The semiformal sector includes non-banking institutions which are authorised to provide limited financial services. By the end of 2013, there has been about 50 major semiformal microfinance institutions which are supported mostly by mass organizations, social funds of local governments, and donors participating in the system (Asian Development Bank, 2014).

Table 1.1: Microfinance Lending in Vietnam

Institutions	Number of Borrowers (million)			Outstanding Loans (US$ million)		
	2010	2012	2013	2010	2012	2013
Vietnam Bank for Social Policies	7.8	5.76[a]	6.98[a]	4,398	4,412	5,350
Vietnam Bank for Agriculture and Rural Development	3.2	1.63	1.49	3,500	1,452	1,390
People's Credit Funds	0.95	1.07	1.12	1,006	1,051	1,294
Microfinance Institutions[b]	0.55	0.73	0.77	122	180	189
Total	**12.5**	**9.19**	**10.36**	**9,206**	**6,285**	**8,223**

Note: [a]Vietnam Bank for Social Policies' number of borrowers for 2012 and 2013 were lower than 2010 mainly because of consolidation of individual accounts into household accounts.

[b]Microfinance Institutions include formal and semi-formal institutions.

Source: (Asian Development Bank, 2014)

The informal sector includes money lenders, family members, friends and those known as '*Hue/Hui'* (Rotating Savings and Credit Associations). Back in 1990s, 'Informal' was the main sector that enabled households, especially rural ones, to access the credit. Most of the loans were not charged with interest, especially those that were lent by a family member through the associations (Nghiem et al., 2006). However, if a household was to borrow from informal lenders, they were often charged with a really high interest rates, for example above 4% per month (McCarty, 2001; Barslund & Tarp, 2008; Poon & Thai, 2010).

1.3. Overview of Vietnam Bank for Social Policies

Vietnam Bank for Social Policies was established in 2003, based on the re-organization of the Bank for the Poor and separation from Vietnam Bank for Agriculture and Rural Development. The bank is considered as an efficient tool of the

Government in mobilising various domestic and international resources to perform the designated socio-policy lending programmes of the Government (Vietnam Bank for Social Policies, 2003a). Since its establishment, the bank has developed and gained remarkable achievements, contributing greatly to the poverty alleviation and the restriction of money-lenders' activities in rural areas. By 2013, the bank has an extensive outreach of 100% commune, with the total outstanding loans of VND 121,699 billion (approximately US$5,766.33 million), making 17 fold increase compared to that of 2003 (Vietnam Bank for Social Policies, 2014).

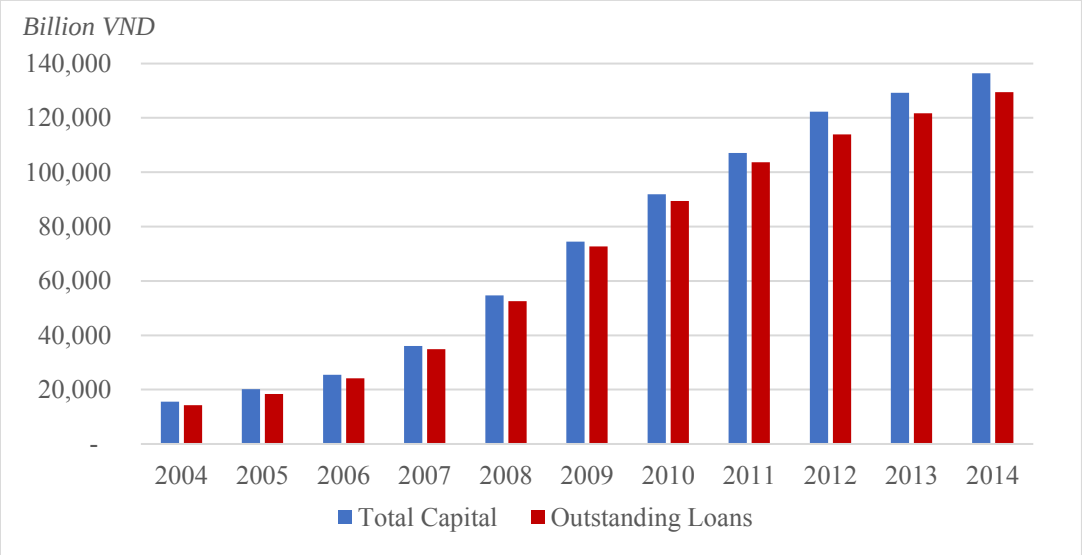

Figure 1.2: Vietnam Bank for Social Policies' Financial Performance (2004-2014)
Source: Summary from Vietnam Bank for Social Policies Annual Reports 2004-2014

The bank provides subsidized and preferential credit to a wide range of target groups, including, for example, poor households, near-poor households, underprivileged students, business and production households living in specially disadvantaged areas and communes, migrant workers, extremely disadvantaged ethnic minorities, etc. (See Appendix 1).

The bank has implemented the method of entrusted lending process to ensure the quick delivery of loans to the poor as well as other social beneficiaries. There are four mass organizations participating in the process, including Farmer Union of

Vietnam, War Veteran Union of Vietnam, Women Union of Vietnam, and Youth Union of Vietnam. While these organizations are responsible for some lending steps (e.g. establishing credit and savings groups, organizing certifying poor households, supervising and urging borrowers in using loans properly), the bank itself conducts loan disbursement, loan collection and safe treasury management (Vietnam Bank for Social Policies, 2003a).

Among different microcredit schemes, lending to the poor households is the main programme which constitutes approximately 81.2%, 52.3%, 40.4% and 36.5% of the bank's loan portfolio in 2004, 2008, 2010 and 2012 respectively (See Appendix 1). There are several criteria that a household should meet to borrow from this programme, for instance, the household should have a permanent or long-term residence permit at the location of the lender, and be in the list of poor households[3] of the local commune, district and town (or household has a permanent or long-term residence in poor communes according to the programme 135[4] of the Government). Although the borrower is not required for collateral and is exempted from borrowing fee, they must be a member of credit and savings group, selected by the group and named in the list proposed to get a loan with certification of Commune People's Committee (Vietnam Bank for Social Policies, 2003b).

As mentioned**,** the microcredit programme for poor households is designed as a group-based lending scheme. In other words, to be eligible for the programme, a household must be a member of credit and savings group in their locality. Once joining the group, they can apply for the loan by submitting a formatted application,

[3] The classification procedure is rather complicated. Basically, whether a household is classified as poor by the local authority depends on the poverty standard set up by the Ministry of Labour, War Invalids and Social Affairs, and other specific criteria set up by each commune.

[4] Programme 135 is the national programme targeting the most vulnerable, disadvantaged ethnic minority-inhabited and mountainous communes, promoting production and access to basic infrastructure, improving education, training local officials and raising people's awareness for better living standards and quality of life.

specifying the amount and purpose of the loan that they intend to take to Head of credit group. Upon receiving the application, the credit group will arrange a meeting of all members to consider which household is able to borrow and prepare a list of applicants. This list will then be subject to ratification by the Commune People's Committee. Once the list is ratified by the People's Committee, it will be sent to a branch for final approval (Vietnam Bank for Social Policies, 2003b). A household can borrow many times, but the total outstanding loans cannot exceed the maximum amount available for each poor household stated by the bank for a specific period. Generally, the loan due is up to 5 years (Vietnam Bank for Social Policies, 2009).

Theoretically, only households who are classified as poor by the local authorities, or reside in poor communes should be eligible to borrow from the bank. However, to ensure high repayment rate, the process of lending and monitoring the credit is rather stringent, which then makes the bank's mission of providing the truly poor with preferential credit gets attenuated. To be more specific, because the repayment rate can affect the amount of funding that a branch can receive, each branch will try to keep their overdue outstanding loans as low as possible. Credit groups and the People's Committee are also highly responsible for the repayment of credit group members, so they tend to exclude the very poor households who might not be able to repay loans from the list of applicants (Dufhues et al., 2002). As a result, non-poor or even better-off households, who are expected to have higher capacity to repay the loans, can actually receive nominations from the communal authorities and get credits from the bank.

1.4. Objectives, Research Questions and Hypotheses

The study examines how well the microcredit programme reaches the poor in the rural areas of Vietnam, to what extent the programme positively affects household welfare,

in terms of income from profits, consumption expenditure, and food consumption expenditure. The research aims to answer two main questions:

(1) Is governmental microcredit programme pro-poor in terms of poverty targeting?

(2) What are the impacts of governmental microcredit programme on household welfare, in terms of income from profits, consumption and food consumption expenditure?

The aim and objectives of this study are inspirited by the belief that governmental microcredit programme is not so poverty targeting, and that given the right policy environment and innovative financial technologies, this can make substantial positive contributions to the poverty alleviation strategy. The main hypotheses of this study are therefore as follows:

(1) Governmental microcredit programme is not pro-poor in terms of targeting.

(2) Governmental microcredit has positive impacts on household welfare, poverty reduction.

2. LITERATURE REVIEW

2.1. Review of Empirical Studies on Microfinance

Microfinance has been extensively examined with large resulting literature, however, its poverty targeting and impacts on poverty reduction remain highly controversial.

First, regarding poverty targeting, although there is a consensus that microfinance should target the poor, there are different schools of thought on who should be targeted (Diop et al., 2007). On the one hand, proponents of the first school of thought argue that microfinance should target the less poor and strengthen their productive activities, because their consumption is theoretically more likely to lead to the creation of jobs and thus by trickle-down, provoking a positive ripple effect on the entire local population, especially on the needy (Diop et al., 2007). The proponents

also argue that credit cannot be easily targeted to reach the poor because they are in no position to undertake an economic activity, many poor people, especially (but not only) the poorest of the poor, cannot make use of credit (Garson, 2001). With this position, the main goal of microfinance is financial efficiency, which allows Microfinance institutions to expand financial services, hence reducing poverty on a larger scale.

On the other hand, microfinance is expected to target the poorest[5] directly, no matter how difficult or costly. The reasons are that: targeting the less poor reinforces existing inequality and the mechanisms of domination, and the inability to invest is the principal obstacle to productive activity. Besides, they believe 'redistribution by the creation of jobs or consumption', as argued by the first school of thought, 'does not necessarily benefit the poorest' (Diop et al., 2007, 33). Concerning the financial efficiency, financial performance of microfinance institutions targeted the poorest clients have been found to be comparable to those of microfinance institutions that do not reach the poorest (Gibbons et al., 2000; Woller, 2000). However, it is worth noting that there is also a growing consensus that microfinance is not for everyone, that entrepreneurial skills and ability are necessary for potential customers to be able to take on debt, especially for the poorest (Morduch & Haley, 2002).

Regarding poverty targeting, empirical studies have found that microfinance has insufficiently penetrated the poorer strata of the society, and that clients of microfinance tend to be hunched around the poverty line, rather than below it (Morduch & Haley, 2002; Copestake et al., 2005). There are several possible reasons that make targeting the poor more difficult and challenging. First, it could be the eligibility criteria imposed by microfinance institutions that places bias toward non-

[5] The Microcredit Summit defined the poorest as those people in the bottom fifty percent of the people living in a country's nationally defined poverty-line (the poor are those living below the poverty line).

poor or better-off clients. Second, the model of microcredit may be simply incapable of reaching the very poor. Third, it could be the problems of self-exclusion, and lack of participation sustainability (Chowdhury et al., 2004; Diop et al., 2007). It is argued that unless there is an active poverty - targeting tool, the poorest will either be missed or they will tend to exclude themselves because they do not see the programmes as being for them, i.e. the inclusion of better-off people may well discourage the poorest group from participating (Navajas et al. 2000; Simanowitz et al., 2000). It is, therefore, important to design a programme that caters to their needs to reach the poorest.

Second, there are opposite positions regarding the impacts of microfinance on household welfare and poverty reduction.

On the one hand, microcredit has proven to be a viable, effective and powerful tool for promoting production, smoothing income flows and consumption cost, improving welfare and enhancing the capacity of poor households to maintain their gains.

A study on microfinance and poverty alleviation in Asia and the Pacific by Quinones & Remenyi (2014) shows that household income of families with access to microcredit is much higher than for comparable households without access to credit. For instance, Indonesia indicated a 12.9% annual average rise in income from borrowers and only 3% rise from non-borrowers. Similarly, in Sri-Lanka, a 15.6% increase in income from borrowers was observed while only 9% increase was reported from non-borrowers.

In another study reviewing cases that provide appropriate and quality financial services for the poor, Wright (2000) notes that the Grameen Bank in Bangladesh ‘not only reduced poverty and improved welfare of participating households but also enhanced the household’s capacity to sustain their gains over time’.

A less controversial and perhaps the most reliable impact evaluation of microfinance programme, Khandker's 2005 paper shows positive results on the impact of microfinance on poverty reduction. Additionally, the impact is reported to be greater for extreme poverty (2.2 percentage points per year) than for moderate poverty (1.6 percentage points per year). This study also implies spill-over effects of the programme: microfinance reduced poverty among non-participants by about 1.0 and 1.3 percentage points a year for moderate poverty and extreme poverty, respectively. Based on these findings, the author concluded that 40% of the entire reduction of moderate poverty in rural Bangladesh was accounted by microfinance.

On the other hand, programmes providing poor households with credit are found not to be always effective in improving welfare and reducing poverty.

Studies by Hulme & Mosley (1996) in seven developing countries, including Bangladesh, Bolivia, India, Indonesia, Kenya, Malawi, and Sri-Lanka show that poor households do not gain from microfinance; it is only the non-poor borrowers with incomes above poverty lines that can benefit and enjoy considerable positive impacts from microfinance. What is more, the findings indicate a vast majority of poor households actually ended up with less incremental income after getting micro-loans, compared to those who did not get such loans.

In addition, the benefits of microfinance are found to be positively correlated with household initial income, that is, the poorest are least likely to benefit from microfinance. For example, Kochar (2011) finds that benefits of microfinance are positively correlated with household initial income, i.e. the poorest are least likely to benefit from microfinance. Rural banks with the goal of increasing the availability of capital to the poorest regions of India actually had a larger effect on the per capita expenditure of the non-poor than that of the poor. There are also other studies that do

not find a statistically significant impact of microcredit on household income and household welfare (e.g. Coleman, 1999; Diagne & Zeller, 2001).

Generally, there has been a wide divergence of opinions and research findings on the impact of microfinance on household welfare and poverty reduction, as well as its poverty targeting across countries in the world. The following part will continue to give empirical studies on microfinance in Vietnam.

2.2. Review of Empirical Studies on Microfinance in Vietnam

Although Vietnam stands out for the large-scale coverage of its microfinance system, questions regarding its achievement in antipoverty impact desired have been posed (Asia-Pacific Economic Cooperation, 2011). There have been different studies on impacts of microfinance on poverty reduction and household welfare.

Quach et al. (2004), using panel data from VHLSS 1993 and 1998, assess the impacts of microfinance on household welfare and the household poverty status. The author has applied probit regression to estimate the determinants of credit and the Heckman two-step method to estimate the impact of credit on household welfare. The findings show that access to credit has a long-term positive and significant impact on household welfare, in terms of consumption per capita, food consumption per capita, non-food consumption per capita, and on the household poverty status. However, the magnitude of this impact is found to be modest.

Swain et al. (2008) employed the household survey data collected in 2006, from Hoa An, a commune in the Mekong Delta area, to examine the impact of microfinance on poverty reduction and compare the impacts between three groups, namely ‘dropout’ (those that had access to microfinance and successfully escaped from poverty), ‘poor member’ (those that had accessed microfinance but was still poor), and ‘non-member’ (those did not participate in any microfinance programme).

In order to obtain in-depth data, the researchers also used Participatory Rural Appraisal, Focus Group Discussions and in-depth interviews. The findings show that members have accumulated more and better quality assets than non-members; they also have opportunities to access training programmes and improve their social status.

Doan et al. (2011) conducted a study to examine the impact of household credit on health care and education expenditure by poor households in peri-urban areas of Ho Chi Minh City. The impact is estimated by employing two methods: Propensity Score Matching and Multiple Treatment Effects with a sample of 411 member and non-member households. The findings suggest that formal credit has positive impacts on education and health care spending, but no significant evidence is found for informal credit.

Nghiem et al. (2012) analyse the impact of NGO microfinance programmes on household welfare by using quasi-experimental survey approach. The sample with 470 households was designed to compare programme member households with non-member households who have similar characteristics. The analysis shows no significant effects of participation in NGO microfinance on income and consumption per adult-equivalent.

Duong & Nghiem (2013) used data retrieved from seven repeatedly cross-sectional VHLSS in 1992-2010 to examine the impact of microfinance on poverty reduction. The authors employ provincial level fixed-effects to control for unobserved attributes to measure the impacts of microfinance on household welfare (income and consumption); and apply a mixed-process, seemingly unrelated estimator for sensitivity analysis. The findings indicate that both the access to and amount of credit have positive impacts on income and consumption. Interestingly, the results suggest consumption smoothing may be a stronger impact of microfinance, in comparison

with income generating. The results, however, show that access to microfinance has no significant effects on the poverty status of households, even though loan volume is associated significantly with the reduction in the probability of being poor.

Overall, studies on microfinance in Vietnam are mainly focused on microfinance programmes as a whole, with less concern about poverty targeting and impact of microfinance programme implemented by a specific financial institution, e.g. Vietnam Bank for Social Policies, Vietnam Bank for Agriculture and Rural Development. Since Vietnam Bank for Social Policies is considered an important policy tool of the government, which can make a great contribution to the implementation of National Target Programme on Hunger Elimination, Poverty Alleviation and Employment, it is rather important to examine the efficiency of the programme. So far, questions regarding poverty targeting of the Vietnam Bank for Social Policies' governmental microcredit programme and its impacts on poverty reduction have just been addressed by only few studies.

With cross-sectional and panel data drawn from VHLSS 2002 and 2004, Cuong (2008) employed two methods to estimate the impact of the programme: (1) instrumental variable (IV) regression and (2) fixed-effects with IV regression using panel data. IV used includes the poverty ratio of the commune and distance to the nearest bank. The author finds that the programme is not very pro-poor in terms of targeting. Specifically, the non-poor account for a larger proportion of the participants, and also tend to receive larger amounts of credit compared to the poor. However, the programme has positive impacts on income per capita, consumption per capita, and has reduced the poverty rate of the participants, which is found for all three Foster-

Greer-Thorbecke poverty measures[6].

Lensink & Pham (2012), employing fixed-effects for panel data obtained from VHLSS 2004 and 2006, evaluate the impact of microcredit provided by the Vietnam Bank for Social Policies on household self-employment profits. The authors use access to credit, defined as the interaction of eligibility and treatment commune, and its interaction with different variables that proxy for household characteristics as a set of instruments. The study indicates that the programme enhances household self-employment profits and has stronger impacts for the poorest households, which suggests poverty-reducing effects. The study also finds the programme remained mistargeted with high ratio[7] of 41.2% and 37.8% in 2004 and 2006, respectively.

The use of instrumental variables in these two studies is believed to help overcome the endogenous bias problem of programme participation. It is, however, questionable on the exclusion restriction condition of the instruments. For instance, if the commune has a higher poverty rate, it is reasonable to assume that the commune has a relatively worse business environment, compared to other communes whose poverty rates are lower, which can negatively affect the possibility of generating income of the household.

In a nutshell, the microfinance sector is dynamic and appropriate enhancements are expected in theoretical, methodological, empirical and policy research methods. To contribute to the ongoing discussion of microfinance in Vietnam in general and governmental microfinance programmes in particular, this study provides further empirical evidences on the poverty-reducing effects of access to the preferential microcredit programme, and its poverty targeting characteristic

[6] See more in Foster, J., Greer, J., & Thorbecke, E. (1984). A class of decomposable poverty measures. *Econometrica: Journal of the Econometric Society*, 761-766.

[7] In the study by Lensink & Pham (2012), the 'mistargeted ratio' was calculated as the ratio of mistargeted to the total of mistargeted and participated. 'Mistargeted ratio', therefore, is not the leakage rate (or inclusion error rate) to be considered in this study.

using data from rural areas of Vietnam.

3. DATA – VIETNAM HOUSEHOLD LIVING STANDARDS SURVEYS

The study uses data from the Vietnam Household Living Standards Surveys (VHLSS), which have been implemented by the General Statistics Office of Vietnam (GSO) with technical assistance from United Nations Development Programme and World Bank. Since 2002, the VHLSS has been conducted regularly every two years (Phung & Nguyen, 2004).

The series of surveys rely on a master sample, which is recruited from the 1999 Population Census enumeration areas using the multi-stage stratified random cluster sampling technique. Basically, communes are stratified on province and urban/rural, and 3 enumeration areas will then be selected for each commune. Both communes and enumeration areas are chosen with probability proportionate to the number of households according to Census 1999. The surveyed households in each enumeration area are selected based on the most updated list of the households in these areas and weight is used to readjust the population change (Phung & Nguyen, 2004).

The surveys collected information through household- and commune-level questionnaires. Regarding household questionnaire, there are 8 main parts: (1) basic demographics, (2) education, (3) health and health care, (4) employment and income, (5) expenditure, (6) housing, electricity, water, sanitation facilities and durable goods, (7) poverty reduction, (8) participation in poverty reduction programmes, including information on loans from poverty alleviation programmes that households had obtained or still owed within one year before the interview.

Data on communal characteristics include: (1) demographics and general information, (2) general economic conditions and aid programmes, (3) non-farm

employment, (4) agricultural production, (5) local infrastructure and transportation, (6) education, (7) health care, (8) social affairs, and (9) credits and savings.

Table 3.1: Summary of VHLSS 2004, 2006, 2008, 2010, and 2012

Survey	Total sample (Number of households)			Number of communes	Notes
2004	9,188	Rural	6,938	2,266	
		Urban	2,250		
2006	9,189	Rural	6,882	2,280	4,298 households (3,267 rural)
		Urban	2,307		from the 2004 survey
2008	9,189	Rural	6,837	2,219	4,138 households (3123 rural)
		Urban	2,352		from the 2006 survey
2010	9,399	Rural	6,750	2,199	No information
		Urban	2,649		
2012	9,399	Rural	6,696	2,218	4,173 households (3,071 rural)
		Urban	2,703		from the 2010 survey

With the research objectives of examining the poverty targeting and impacts of governmental microcredit programme on poverty reduction in rural Vietnam, the study's sample is restricted to rural households only. Specifically, in the next section, 'Poverty Targeting', data to be used includes all the rural households from each round of the survey from 2004 to 2012. For the impact assessment purpose, three balanced panels are constructed: 2004-2006, 2006-2008, and 2010-2012. Each panel consists of rural households that were interviewed in the two corresponding years, which will be discussed in detail in Section 5 'Impacts of the Governmental Microcredit Programme'.

Despite the richness of the data, VHLSS is not an ideal dataset for specific research purposes like microfinance assessment. For example, the questionnaires do not specify the purposes of credit borrowing, whether a household participated in a credit and savings group, the number of households in each credit and savings group, whether it was the decision of the household not to participate in the microcredit programme, or whether it was the exclusion of the programme that made them unable

to receive credit. Above all, the main issue is that the study is using non-experimental data, it is, therefore, necessary to address the fact that households are not randomly assigned to the microcredit programme.

4. POVERTY TARGETING

Poverty targeting will be examined with four respects: (1) Socio-economic characteristics of the programme beneficiaries and non-beneficiaries, (2) Error rate of the programme, (3) Coverage rate, credit amount and interest rate for eligible and ineligible groups, and (4) Group targeting.

Researches have shown that expenditure-based indicators are found to be more reliable than indices that are income-based (Deaton, 1997; Filmer & Pritchett, 2001). Since households are classified as poor, mainly by the income-based national poverty standard, it would be better to examine the poverty targeting based on not only this index, but also other expenditure-based economic status indices. With the available data on household assets, the study estimates the wealth level of households by computing two indices using Principal Component Analysis, the method recommended by many studies in economics and public policy (Filmer & Pritchett, 2001; McKenzie, 2004; Vyas & Kumaranayake, 2006; Labonne et al., 2007). The first index is 'durable score', computed from ownership of 36 different assets listed in the Appendix 2. The second index is 'socio-economic score', calculated from combination of housing characteristics [8], access to utilities and infrastructure (electricity, sanitation facility), and durable asset ownership. Wealth level, beside income and consumption expenditure per capita, will then be used to examine the group targeting of the microcredit programme.

[8] It is noted that information of housing characteristics (pole, roof and wall materials) is only available in the two surveys of 2010 and 2012. Therefore, socio-economic scores of 2004, 2006, and 2008 are calculated based on access to utilities and infrastructure, and durable asset ownership only.

4.1. Socio-economic Characteristics of Beneficiary and Non-beneficiary Group

To begin with, the study directly compares the average households in the beneficiary and non-beneficiary group in terms of income and consumption expenditure per capita, durable and socio-economic score. On average, all the differences are statistically significant, suggesting that the programme beneficiaries are actually poorer than non-beneficiaries.

Table 4.1: Socio-economic Characteristics by Group

	Beneficiaries Average (1)	Non-beneficiaries Average (2)	Estimated Difference (3)
Panel A: Year 2004			
Income per capita per month (VND/person/month)	305.220	442.153	-136.934*** (11.103)
Consumption per capita per month (VND/person/month)	244.395	295.764	-51.369*** (9.510)
Durable score	-0.875	0.057	-0.933*** (0.090)
Socio-economic score	-0.956	0.063	-1.019*** (0.097)
Number of observations	427	6511	
Panel B: Year 2006			
Income per capita per month (VND/person/month)	404.752	572.024	-167.273*** (16.331)
Consumption per capita per month (VND/person/month)	303.540	374.909	-71.368*** (7.783)
Durable score	-0.829	0.091	-0.920*** (0.081)
Socio-economic score	-0.906	0.099	-1.006*** (0.089)
Number of observations	680	6202	
Panel D: Year 2008			
Income per capita per month (VND/person/month)	595.592	837.504	-241.912*** (22.845)
Consumption per capita per month (VND/person/month)	494.839	576.536	-81.697*** (9.838)
Durable score	-0.705	0.126	-0.831*** (0.074)
Socio-economic score	-0.781	0.139	-0.920*** (0.080)
Number of observations	1033	5804	
Panel D: Year 2010			
Income per capita per month	725.071	1,285.574	-560.503***

(VND/person/month)			(48.867)
Consumption per capita per month (VND/person/month)	719.082	1,004.432	-285.349*** (21.052)
Durable score	-1.137	0.176	-1.312*** (0.085)
Socio-economic score	-1.544	0.239	-1.783*** (0.110)
Number of observations	903	5847	
Panel E: Year 2012			
Income per capita per month (VND/person/month)	1,014.637	1,813.040	-798.403*** (38.943)
Consumption per capita per month (VND/person/month)	981.299	1,345.523	-364.224*** (24.629)
Durable scores	-1.298	0.195	-1.493*** (0.084)
Socio-economic score	-1.663	0.250	-1.912*** (0.109)
Number of observation	874	5822	

Notes: Standard errors are in parentheses. Statistical significance at the 1, 5, and 10 percent levels is indicated by ***, **, and *, respectively.

It could be seen that, in terms of average socio-economic characteristics of beneficiaries and non-beneficiaries, specifically income per capita, consumption expenditure per capita, durable score, as well as socio-economic score, the microcredit programme seems doing well in targeting the poor. The average non-beneficiaries have been better-off than the beneficiaries in all four respects over time. The next sub-section will try to figure out whether there exists a leakage problem in the programme, that is, whether there are ineligible households participating in the programme.

4.2. Error Rates of the Programme

In this sub-section, the study finds out the 'error rate' of targeting. 'Error rate' is defined to be equal to 1 if either the household was classified as poor by the local commune authorities or was in the commune with programme 135 but did not receive credit from the bank (exclusion error), or if it was not eligible and did receive credit (inclusion error). However, for the household that did not borrow from the bank, since the surveys do not indicate whether it was the household's decision not to participate

in the programme (i.e. there is no demand for microcredit), or whether it was the exclusion of the programme that made them unable to receive credit (i.e. the household was rejected and was not on the list of beneficiaries), only the inclusion errors could be estimated based on the available data.

Table 4.2: Inclusion Error of the Programme

Year	Beneficiaries	Mean	Standard Deviation
2004	427	0.2424	0.4286
2006	680	0.2460	0.4307
2008	1033	0.2055	0.4041
2010	903	0.1985	0.3989
2012	874	0.2007	0.4006

The beneficiaries of the programme include not only eligible households but also ineligible households. In particular, the inclusion error rate is found to be quite high, with nearly 25% of the beneficiaries were actually not eligible to participate in the preferential microcredit programme in the year 2004, and 2006. Since 2008, the inclusion error rate has reduced to approximately 20% (Table 4.2). Still, this suggests the participation of non-eligible households in the programme has remained a problem over time. While being classified as poor by the local authorities is considered as an essential criterion for the credit programme, it is likely the 'elite capture' and the 'exclusion process' that could explain these errors. For example, the community process could favour friends and relatives of the elites, who are not in the poorer strata of the commune; or non-poor or even better-off households, who are likely to have higher capacity to repay the loans, actually receive nominations and get credits from the bank, which results in a lack of legitimacy with the process.

4.3. Coverage Rate, Credit Amount and Interest Rate of In- and Eligible Group

The study investigates how well the programme reaches eligible households. Data shows that only 11.43% and 18.84% of the eligible households in the rural areas

borrowed from the bank in 2004 and 2006, respectively, suggesting a relatively low coverage rate of the programme. The coverage rate, however, has been improved over time, with 28.61%, 30.14%, and 29.04% of the rural eligible households borrowed from the bank in 2008, 2010, and 2012, respectively. In addition, the eligible, on average, tended to receive smaller amounts of credit than the ineligible. Nevertheless, they were able to enjoy the relatively lower interest rate than the ineligible.

Table 4.3: Coverage Rate, Average Credit Amount and Interest Rate of Programme

	Eligible Average (1)	Ineligible Average (2)	Total Average (3)	Difference (1)-(2) (4)
Panel A: Year 2004				
Coverage rate: % of borrowing households	11.43	4.17	6.15	
	(0.73)	(0.28)	(0.29)	
Amount of borrowed credit (VND 1,000)	4,100	4,509	4,301	-408
	(213.22)	(309.59)	(186.92)	(373.80)
Average of monthly interest rate (%)	0.42	0.73	0.57	-0.31**
	(0.02)	(0.12)	(0.06)	(0.12)
Panel B: Year 2006				
Coverage rate: % of borrowing households	18.84	5.98	9.88	
	(0.86)	(0.34)	(0.36)	
Amount of borrowed credit (VND 1,000)	5,347	6,916	6,009	-1,570*
	(165.91)	(942.15)	(409.72)	(828.00)
Average of monthly interest rate (%)	0.56	0.56	0.56	-0.01
	(0.06)	(0.06)	(0.04)	(0.09)
Panel C: Year 2008				
Coverage rate: % of borrowing households	28.61	9.65	15.11	
	(1.02)	(0.42)	(0.43)	
Amount of borrowed credit (VND 1,000)	7,970	8,726	8,314	-755*
	(354.59)	(259.94)	(226.77)	(455.01)
Average of monthly interest rate (%)	0.61	0.59	0.60	0.03
	(0.04)	(0.01)	(0.02)	(0.05)
Panel D: Year 2010				
Coverage rate: % of borrowing households	30.14	6.73	13.38	
	(1.05)	(0.36)	(0.41)	
Amount of borrowed credit (VND 1,000)	12,649	12,095	12,450	554
	(356.47)	(482.31)	(286.67)	(597.31)
Average of monthly interest rate (%)	0.45	0.50	0.47	-0.05**
	(0.01)	(0.02)	(0.01)	(0.02)
Panel E: Year 2012				
Coverage rate: % of borrowing households	29.04	6.75	13.05	
	(1.04)	(0.36)	(0.41)	
Amount of borrowed credit (VND 1,000)	15,239	16,789	15,813	-1,551**
	(429.59)	(705.44)	(376.74)	(778.68)

Average of monthly interest rate (%)	0.49	0.56	0.51	-0.07***
	(0.01)	(0.02)	(0.01)	(0.02)

Notes: Average of monthly interest rate is calculated as weighted average interest rate of all the Vietnam Bank for Social Policies' loans. For example, given a household has two loans of VND 5 million and 2 million with interest rate of 0.65% and 0.8% per month, respectively, average interest rate is (0.65%*5+0.8%*2)/(5+2) = 0.69% per month. Standard errors are in parentheses. Statistical significance at the 1, 5, and 10 percent levels is indicated by ***, **, and *, respectively.

4.4. Group Targeting of the Programme

For further assessment of poverty targeting, particularly to examine the groups to which the programme beneficiaries are likely to belong, the study classifies rural households into five groups using quantiles of income-based and expenditure-based indicators.

Data has shown that socio-economic status of the beneficiaries, in terms of income per capita and consumption per capita, on average, are quite similar to that of households who fall between the second poorest and the middle group (except for 2008, the beneficiaries, on average, have higher income and consumption than the middle group). However, if we are able to control for the inclusion error, the programme beneficiaries are likely to be among the poorest and the second poorest group.

Table 4.4: Group Targeting by Income per Capita per Month

Unit: VND 1,000/person/month

Year	By quantiles of income per capita per month					Beneficiaries	Beneficiaries (Without Inclusion Error)
	Poorest (20%)	Second	Middle	Fourth	Richest (20%)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2004	152.79	248.79	340.58	475.56	951.22	305.22	220.88
	(1.15)	(0.68)	(0.81)	(1.43)	(16.52)	(9.92)	(11.00)
n	1388	1388	1387	1388	1387	427	132
2006	190.74	313.35	427.77	601.62	1244.37	404.75	291.26
	(1.44)	(0.80)	(1.01)	(1.71)	(24.78)	(14.53)	(15.88)
n	1377	1376	1377	1376	1376	680	261
2008	252.01	419.31	586.49	841.71	1905.81	595.59	402.70
	(1.97)	(1.23)	(1.49)	(2.77)	(56.56)	(17.42)	(11.05)

n	1368	1367	1368	1367	1367	1033	383
2010	369.14	632.92	899.71	1292.90	2858.30	725.07	523.00
	(2.82)	(2.00)	(2.31)	(4.26)	(185.60)	(19.09)	(17.36)
n	1350	1350	1350	1350	1350	903	407
2012	496.27	901.11	1339.20	1945.11	3863.35	1014.64	748.52
	(3.61)	(3.17)	(3.86)	(5.89)	(61.54)	(31.78)	(27.75)
n	1340	1339	1339	1339	1339	874	422

Notes: Standard errors are in parentheses, clustered at the commune level. Column (7) is for sample of only those beneficiaries who are eligible for the programme (i.e. without inclusion error).

Table 4.5: Group Targeting by Consumption per Capita per Month

Unit: VND 1,000/person/month

Year	By quantiles of consumption per capita per month					Beneficiaries	Beneficiaries (Without Inclusion Error)
	Poorest (20%)	Second	Middle	Fourth	Richest (20%)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2004	131.59	193.69	248.58	326.54	562.79	244.40	183.20
	(0.80)	(0.42)	(0.48)	(0.79)	(6.52)	(9.22)	(7.39)
n	1388	1388	1387	1388	1387	427	132
2006	161.77	240.19	311.94	414.37	711.20	303.54	231.03
	(1.05)	(0.51)	(0.63)	(1.03)	(8.57)	(7.18)	(6.16)
n	1377	1376	1377	1376	1376	680	261
2008	256.49	378.70	482.69	631.02	1072.36	494.84	373.79
	(1.63)	(0.74)	(0.94)	(1.50)	(11.75)	(8.55)	(8.95)
n	1368	1367	1368	1367	1367	1033	383
2010	383.12	605.16	810.85	1087.21	1944.95	719.08	542.39
	(2.87)	(1.51)	(1.83)	(2.78)	(41.44)	(17.25)	(15.90)
n	1350	1350	1350	1350	1350	903	407
2012	524.44	828.27	1104.43	1477.70	2555.65	981.30	820.40
	(3.83)	(2.01)	(2.52)	(3.68)	(28.55)	(21.66)	(26.67)
n	1340	1339	1339	1339	1339	874	422

Notes: Standard errors are in parentheses, clustered at the commune level. Column (7) is for sample of only those beneficiaries who are eligible for the programme (i.e. without inclusion error).

Table 4.6: Group Targeting by Durable Score

Year	By quantiles of durable score					Beneficiaries	Beneficiaries (Without Inclusion Error)
	Poorest (20%)	Second	Middle	Fourth	Richest (20%)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2004	-2.44	-1.30	-0.28	0.75	3.26	-0.88	-1.77
	(0.01)	(0.01)	(0.01)	(0.01)	(0.06)	(0.09)	(0.09)
n	1388	1388	1390	1385	1387	427	132
2006	-2.69	-1.29	-0.20	0.88	3.31	-0.83	-1.64
	(0.02)	(0.01)	(0.01)	(0.01)	(0.05)	(0.08)	(0.08)
n	1394	1359	1377	1376	1376	680	261
2008	-3.01	-1.16	-0.01	1.07	3.12	-0.71	-1.73
	(0.02)	(0.01)	(0.01)	(0.01)	(0.04)	(0.07)	(0.09)
n	1368	1368	1389	1345	1367	1033	383
2010	-3.17	-1.13	0.05	1.16	3.11	-1.14	-2.16

	(0.03)	(0.01)	(0.01)	(0.01)	(0.04)	(0.08)	(0.09)
n	1350	1350	1351	1369	1330	903	407
2012	-3.33	-1.08	0.18	1.18	3.07	-1.30	-2.10
	(0.03)	(0.01)	(0.01)	(0.01)	(0.04)	(0.08)	(0.10)
n	1340	1346	1332	1348	1330	874	422

Notes: Standard errors are in parentheses, clustered at the commune level. Column (7) is for sample of only those beneficiaries who are eligible for the programme (i.e. without inclusion error).

Similarly, in terms of durable score and socio-economic score, Table 4.6 and 4.7 show that on average, the programme beneficiaries somehow fall between the second poorest and the middle group (except for 2010 and 2012, the beneficiaries are among the poorest and the second poorest group). Without inclusion error, the beneficiaries are likely to belong to the poorest and the second poorest group.

Table 4.7: Group Targeting by Socio-economic Score

Year	By quantiles of socio-economic score					Beneficiaries	Beneficiaries (Without Error)
	Poorest (20%)	Second	Middle	Fourth	Richest (20%)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2004	-2.72	-1.33	-0.23	0.87	3.42	-0.96	-1.90
	(0.02)	(0.01)	(0.01)	(0.01)	(0.06)	(0.09)	(0.10)
n	1388	1388	1388	1387	1387	427	132
2006	-2.94	-1.31	-0.18	0.97	3.46	-0.91	-1.75
	(0.02)	(0.01)	(0.01)	(0.01)	(0.05)	(0.09)	(0.09)
n	1377	1376	1377	1377	1375	680	261
2008	-3.24	-1.20	0.01	1.14	3.28	-0.78	-1.87
	(0.03)	(0.01)	(0.01)	(0.01)	(0.04)	(0.08)	(0.10)
n	1369	1366	1368	1367	1367	1033	383
2010	-3.99	-1.26	0.34	1.58	3.34	-1.54	-2.77
	(0.04)	(0.02)	(0.01)	(0.01)	(0.03)	(0.11)	(0.13)
n	1350	1350	1350	1350	1350	903	407
2012	-4.13	-1.24	0.43	1.63	3.31	-1.66	-2.73
	(0.05)	(0.02)	(0.01)	(0.01)	(0.03)	(0.11)	(0.13)
n	1340	1339	1339	1339	1339	874	422

Notes: Standard errors are in parentheses, clustered at the commune level. Column (7) is for sample of only those beneficiaries who are eligible for the programme (i.e. without inclusion error).

It could be seen that, by directly comparing the average socio-economic characteristics of the beneficiaries and non-beneficiaries, the programme seems sufficient in targeting the poor, with data showing the beneficiaries are poorer than non-beneficiaries in all four aspects. However, the high inclusion error rate suggests there is a large number of ineligible households participating in the programme and

enjoying the larger amount of credit, despite higher average interest rate. The programme, therefore, in fact, has actually insufficiently targeted the poor. Likewise, the programme failed to target the poorer strata of the rural households, that is, clients of the programme are close to median group, instead of the poorest group. The analysis from group targeting also suggests if the bank could control for the participation of ineligible households in the programme, the programme will be better reaching the poorer strata of the commune, albeit the poorest group is still excluded.

There are three possible reasons behind the failure to target the poor of the programme. The first reason is the difference in the poverty definition between local commune authorities, that is, since the poverty classification is based on income poverty line set up by the Ministry of Labour, War Invalids and Social Affairs and other criteria set up by each commune, which can be different from one commune to another, there may be differences in perspectives on poverty across communes and over time. The second reason can be the 'exclusion process', that is, the local communities hesitate to nominate the poorest group of households for the microcredit programme; they instead include the less poor, non-poor or even better-off households, who are likely to have higher capacity to repay the loans, in the list of applicants. The third is perhaps the 'elite capture': friends and relatives of the elites, who are not in the poorer strata of the commune, could be favoured for the preferential credit.

According to Morduch (1998), the issue of mistargeting may make it complicated to estimate the true impact of microcredit. However, as Pitt (1999) confirms, such mistargeting issue does not necessarily lead to the bias of impact estimation, which will be discussed in more detail in Section 5.

5. IMPACTS OF THE GOVERNMENTAL MICROCREDIT PROGRAMME

5.1. Estimation Strategy

The aim of this study is to examine whether participation in the Vietnam Bank for Social Policies' preferential microcredit programme results in greater household welfare, in terms of income from profits[9], consumption expenditure and food consumption expenditure. A natural starting point would be to estimate a model in which outcome, Y_{ij} is assumed to depend on participation in the programme, D_{ij}, a set of household-specific controls, X_i and a set of commune-specific controls, C_j:

$$\ln \boldsymbol{Y_{ij}} = \boldsymbol{\beta_{0ij}} + \boldsymbol{X_{ij}\beta_1} + \boldsymbol{C_j\beta_2} + \boldsymbol{D_{ij}\beta_3} + \boldsymbol{Year\beta_4} + \boldsymbol{E_{ij}\beta_5} + \boldsymbol{(Year * E_{ij})\beta_6} + \boldsymbol{\varepsilon_{ij}}, \quad (1)$$

where $\boldsymbol{\varepsilon_{ij}}$ captures unobserved heterogeneity. The X vector includes observable exogenous household variables that are likely to be correlated with outcome, such as household size (number of household members), total land managed and used (annual and perennial crop land, forestry land, water surface, garden, and shifting-cultivation farmland), share of farming labour and dependence members[10], age and marital status of the household head.

The vector of commune characteristics, C_j, includes basic demographics of the commune, such as whether there is access to electricity, access to car road, access to public transport, access to post office, or inter- or intra-market in the commune.

D_{ij} indicates the household's credit participation, measured by two proxies: (1) a binary variable indicating whether the household participated in the programme, and (2) a continuous variable indicating the loan amount taken from the programme.

Year is a dummy variable that controls for the possible impact of a year-specific shock on the household welfare (= 0 for the 1st year, and = 1 for the 2nd year

[9] Income from profits is defined as the total profits from agriculture, forestry and aquaculture activities.

[10] In this study, a member is considered as dependent if they are under or over working age under the jurisdiction, according to the current Vietnam Labour Code (i.e. if they are under 15 years old, or over 55 years old as for women, or over 60 years old as for men).

of each panel). E_{ij} is a binary variable, indicating whether the household is eligible for the programme, that is the household is either classified as poor by the commune authority, or residing in the poor commune with the programme 135 of the Government. The interaction between *Year* and *Eligibility* controls for different linear time trends between eligible and ineligible households.

Despite the richness of the VHLSS, there may well be other unmeasured characteristics that distinguish the programme beneficiary from non-beneficiary and which cannot be controlled in the regression model. If conditional on the controls, these other characteristics are correlated with observable differences between the beneficiary and non-beneficiary, then the estimated impact of the programme will be biased. There are three important sources which can lead to bias. The first possibility is the endogenous decision of household to participate in the programme and the desired amount of loan. The second bias may come from the eligibility selection procedure of commune authority. The third may arise if the placement of microfinance programmes is non-random, that is, communes with microfinance programmes tend to be poorer than the villages or communes without them.

To the extent that household and commune unobserved characteristics do not vary over time, then they can be absorbed in household-specific and commune-specific fixed effects, β_{0ij}. To measure the impact of credit participation on household welfare, specifically income from profits, consumption expenditure and food consumption expenditure, the study employs fixed-effects (FE) strategy, specified as below (2):

$$\ln \boldsymbol{Y_{ijt}} = \boldsymbol{\beta_{0ij}} + \boldsymbol{X_{ijt}\beta_1} + \boldsymbol{C_{jt}\beta_2} + \boldsymbol{D_{ijt}\beta_3} + \boldsymbol{Year_t\beta_4} + \boldsymbol{E_{ijt}\beta_5} + \boldsymbol{(Year_t * E_{ijt})\beta_6} + \boldsymbol{\gamma_{ij}} + \boldsymbol{\delta_j} + \boldsymbol{\varepsilon_{ijt}},$$

in which, γ_{ij} and δ_j are unobserved time-invariant variables at the household and commune level, respectively.

Although the fixed-effects estimator can control for unobserved and time-invariant attributes that may both affect the outcome variable and the participation status of the households, it cannot solve the endogeneity problems mentioned above entirely, because the unobservable factors at both household and commune levels may vary over time. The fixed-effect model, therefore, may provide a consistent but biased estimate of the impact of microfinance on household welfare.

To overcome this issue, in combination with fixed-effects, the study uses instrumental variable for endogenous variable: microcredit participation. The main challenge is to choose a (set of) good instrument(s) that meets two conditions: (1) the instruments must be highly correlated with the participation status of the household, and (2) the instruments must be uncorrelated with the outcome variable, i.e. the instruments do not directly affect, and only affect the household welfare through the impact of credit participation. Following Lensink and Pham (2012), the study employs access to credit, defined as the interaction between a binary variable that reflects whether a household is eligible to participate in the programme, and a binary variable indicating whether that household resides in the treatment commune (a commune is defined as treated if there is access to the programme in the commune).

As mentioned in the Section 3, for the purpose of impact assessment, the study uses three balanced panels: 2004-2006, 2006-2008, and 2010-2012. The first panel consists of 2,844 households (i.e. 5,688 observations) which appeared in two surveys 2004 and 2006. The second panel includes 2,731 households (i.e. 5,462 observations) observed in surveys 2006 and 2008. There are 2,287 households (i.e. 4,574 observations) in the panel 2010-2012. Details of the credit participation status in the three panels are as follows.

Table 5.1: Household Credit Participation Status

Unit: Household, VND million

	Panel 2004-2006		Panel 2006-2008		Panel 2010-2012	
	2004	2006	2006	2008	2010	2012
Borrower in both years	61	61	152	152	196	196
Average credit amount	4.256	5.050	5.138	7.675	13.240	17.072
Borrower in 1st year only	130	NA	157	NA	234	NA
Average credit amount	4.608	0	6.256	0	11.657	0
Borrower in 2nd year only	NA	250	NA	311	NA	196
Average credit amount	0	5.984	0	9.076	0	15.143
Total borrowers	191	311	309	463	430	392
Average credit amount	4.496	5.801	5.706	8.617	12.452	16.107

5.2. Empirical Results and Discussion

The estimation results for the impact of the programme on household profits for panel 2004-2006, 2006-2008, and 2010-2012 are presented in tables 5.2, 5.3, and 5.4, respectively.

The study begins with the panel 2004-2006. The first column is based on Ordinary Least Squares (OLS) estimates of model (1). These OLS estimates indicate that relative to those households who did not participate in the programme, the beneficiaries have a significantly lower household income from profits. The results demonstrate the disadvantaged backgrounds of the microcredit participants. Column (3) shows that when controlling for both observed and unobserved characteristics of households and communes that are fixed over time and have linear and additive influence on household welfare, the negative impact of the microcredit programme in the first column is simply an artifact of the disadvantages of participant households. Using fixed-effects with instrumental variable to overcome the endogeneity problems, estimation results in column (5) and (6) are consistent with the estimation results of the fixed-effects model. The larger magnitude of coefficients on the programme participation and credit amount, however, suggests that the fixed-effects model without instrumental variable does under-estimate the real impact of the microcredit programme on household income from profits.

The estimated coefficients from the panel 2004-2006 indicate that households who participate in the microcredit programme, relative to those who do not, have a higher income from profits of 18.41% (= $e^{0.169}$ -1). Likewise, for each additional VND 1 million of credit taken from the governmental microcredit programme, ceteris paribus, the household profits will increase by 3.46 percentage point (= $e^{0.034}$ -1).

Table 5.2: Impact of Credit Participation on Household Profits (2004-2006)
Dependent variable is log of household income from profits

	Pooled OLS (1)	Pooled OLS (2)	Fixed-Effects (3)	Fixed-Effects (4)	FE with IV (5)	FE with IV (6)
Credit participation						
Programme participation	-0.069*		0.073**		0.169**	
	(0.038)		(0.035)		(0.084)	
Credit amount (VND million)		0.005		0.006		0.037**
		(0.006)		(0.006)		(0.019)
Eligibility	-0.302***	-0.309***	-0.121***	-0.117***	-0.129***	-0.126***
	(0.038)	(0.038)	(0.044)	(0.044)	(0.045)	(0.045)
Year2006	0.029	0.027	0.050**	0.051***	0.048**	0.047**
	(0.032)	(0.032)	(0.020)	(0.020)	(0.020)	(0.020)
Time trend (Year*Eligibility)	-0.156***	-0.162***	-0.045	-0.043	-0.052	-0.055
	(0.053)	(0.053)	(0.033)	(0.033)	(0.033)	(0.034)
Household characteristics						
Household size	0.408***	0.407***	0.228***	0.229***	0.226***	0.227***
	(0.038)	(0.037)	(0.044)	(0.045)	(0.044)	(0.045)
Household size square	-0.020***	-0.020***	-0.010***	-0.010***	-0.010***	-0.010***
	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Total land (hectares)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share of farming labour	0.260***	0.259***	0.319***	0.318***	0.320***	0.315***
	(0.057)	(0.057)	(0.078)	(0.078)	(0.077)	(0.078)
Share of dependence members	-0.502***	-0.503***	-0.310***	-0.312***	-0.308***	-0.308***
	(0.053)	(0.053)	(0.104)	(0.104)	(0.105)	(0.105)
Age of household head	0.011	0.010	0.007	0.008	0.006	0.006
	(0.007)	(0.007)	(0.025)	(0.025)	(0.025)	(0.025)
Age of household head square	-0.000**	-0.000**	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married household head	0.175***	0.175***	0.013	0.010	0.015	0.005
	(0.038)	(0.038)	(0.090)	(0.090)	(0.090)	(0.090)
Commune characteristics						
Access to car road	-0.283***	-0.283***	0.115	0.112	0.121	0.122
	(0.070)	(0.070)	(0.119)	(0.119)	(0.119)	(0.119)
Access to public transport	0.072***	0.074***	-0.020	-0.020	-0.020	-0.016
	(0.024)	(0.024)	(0.027)	(0.027)	(0.027)	(0.027)
Access to electricity	-0.068	-0.071	0.077	0.079	0.076	0.085
	(0.061)	(0.061)	(0.079)	(0.079)	(0.078)	(0.078)
Access to post office	-0.065*	-0.064*	0.004	0.004	0.003	0.002
	(0.035)	(0.035)	(0.041)	(0.041)	(0.041)	(0.041)
Access to market	0.025	0.025	0.015	0.015	0.014	0.014
	(0.025)	(0.025)	(0.036)	(0.036)	(0.036)	(0.036)
Observations	5688	5688	5688	5688	5688	5688
Number of households	2844	2844	2844	2844	2844	2844

Adjusted R^2	0.235	0.234				
Kleibergen-Paap rk LM statistic					156.331	102.112
Cragg-Donald Wald F statistic					727.679	399.764

Notes: Robust standard errors are in parentheses. Statistical significance at the 1, 5, and 10 percent levels is indicated by ***, **, and *, respectively.

Similarly, the study applies the same estimation strategy for the two panels 2006-2008, and 2010-2012. Although the estimation results are positive, and consistent with that of the panel 2004-2006, the impacts are found not to be statistically significant.

Table 5.3: Impact of Credit Participation on Household Profits (2006-2008)

Dependent variable is log of household income from profits

	Pooled OLS (1)	Pooled OLS (2)	Fixed-Effects (3)	Fixed-Effects (4)	FE with IV (5)	FE with IV (6)
Credit participation						
Programme participation	-0.148***		0.039		0.082	
	(0.034)		(0.035)		(0.098)	
Credit amount (VND million)		-0.011**		0.006		0.017
		(0.005)		(0.006)		(0.020)
Eligibility	-0.401***	-0.416***	-0.076*	-0.074	-0.078*	-0.076*
	(0.037)	(0.037)	(0.046)	(0.046)	(0.046)	(0.046)
Year2008	0.091***	0.089***	0.065***	0.065***	0.064***	0.062***
	(0.031)	(0.031)	(0.021)	(0.021)	(0.021)	(0.021)
Time trend	-0.009	-0.010	-0.010	-0.011	-0.012	-0.016
(Year*Eligibility)	(0.052)	(0.052)	(0.034)	(0.034)	(0.034)	(0.035)
Household characteristics						
Household size	0.452***	0.450***	0.322***	0.321***	0.322***	0.320***
	(0.032)	(0.033)	(0.045)	(0.045)	(0.045)	(0.045)
Household size square	-0.026***	-0.026***	-0.020***	-0.020***	-0.020***	-0.020***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Total land (hectares)	0.013***	0.013***	0.003**	0.003**	0.003**	0.003**
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Share of farming labour	0.251***	0.250***	0.281***	0.279***	0.283***	0.279***
	(0.062)	(0.062)	(0.080)	(0.080)	(0.080)	(0.080)
Share of dependence members	-0.499***	-0.497***	-0.168	-0.167	-0.167	-0.164
	(0.058)	(0.058)	(0.105)	(0.105)	(0.105)	(0.105)
Age of household head	0.013*	0.013*	0.019	0.019	0.019	0.019
	(0.008)	(0.008)	(0.023)	(0.023)	(0.023)	(0.022)
Age of household head square	-0.000**	-0.000**	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married household head	0.161***	0.161***	0.014	0.014	0.014	0.016
	(0.043)	(0.043)	(0.099)	(0.099)	(0.099)	(0.099)
Commune characteristics						
Access to car road	-0.303***	-0.309***	0.025	0.025	0.027	0.030
	(0.100)	(0.101)	(0.156)	(0.156)	(0.154)	(0.155)
Access to public transport	0.088***	0.089***	0.015	0.015	0.015	0.015
	(0.026)	(0.026)	(0.031)	(0.031)	(0.031)	(0.031)

Access to electricity	0.058	0.052	0.025	0.025	0.023	0.023
	(0.066)	(0.065)	(0.072)	(0.072)	(0.073)	(0.072)
Access to post office	-0.036	-0.038	0.042	0.042	0.042	0.039
	(0.038)	(0.038)	(0.052)	(0.052)	(0.052)	(0.053)
Access to market	0.023	0.026	-0.060	-0.060	-0.061	-0.063
	(0.026)	(0.026)	(0.045)	(0.045)	(0.045)	(0.045)
Observations	5462	5462	5462	5462	5462	5462
Number of households	2731	2731	2731	2731	2731	2731
Adjusted R^2	0.290	0.288				
Kleibergen-Paap rk LM statistic					130.588	83.648
Cragg-Donald Wald F statistic					361.693	177.711

Notes: Robust standard errors are in parentheses. Statistical significance at the 1, 5, and 10 percent levels is indicated by ***, **, and *, respectively.

Table 5.4: Impact of Credit Participation on Household Profits (2010-2012)
Dependent variable is log of household income from profits

	Pooled OLS (1)	Pooled OLS (2)	Fixed-Effects (3)	Fixed-Effects (4)	FE with IV (5)	FE with IV (6)
Credit participation						
Programme participation	-0.218***		-0.007		0.049	
	(0.038)		(0.049)		(0.112)	
Credit amount (million VND)		-0.019***		0.001		0.009
		(0.005)		(0.006)		(0.020)
Eligibility	-0.265***	-0.291***	-0.030	-0.031	-0.037	-0.035
	(0.044)	(0.044)	(0.055)	(0.054)	(0.057)	(0.056)
Year2012	0.136***	0.136***	0.122***	0.122***	0.123***	0.123***
	(0.037)	(0.037)	(0.026)	(0.026)	(0.026)	(0.026)
Time trend (Year*Eligibility)	-0.212***	-0.206***	-0.163***	-0.163***	-0.162***	-0.164***
	(0.057)	(0.058)	(0.039)	(0.039)	(0.039)	(0.039)
Household characteristics						
Household size	0.531***	0.527***	0.350***	0.349***	0.349***	0.348***
	(0.044)	(0.045)	(0.063)	(0.063)	(0.063)	(0.062)
Household size square	-0.034***	-0.034***	-0.021***	-0.021***	-0.021***	-0.021***
	(0.004)	(0.004)	(0.006)	(0.006)	(0.006)	(0.006)
Total land (hectares)	0.019***	0.019***	0.007***	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Share of farming labour	0.571***	0.562***	0.554***	0.554***	0.553***	0.554***
	(0.080)	(0.080)	(0.102)	(0.103)	(0.102)	(0.102)
Share of dependence members	-0.508***	-0.506***	-0.119	-0.120	-0.120	-0.121
	(0.064)	(0.064)	(0.119)	(0.120)	(0.119)	(0.119)
Age of household head	0.025***	0.025***	0.042*	0.041*	0.041*	0.040
	(0.008)	(0.008)	(0.025)	(0.025)	(0.025)	(0.026)
Age of household head square	-0.000***	-0.000***	-0.000*	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married household head	0.250***	0.253***	0.113	0.113	0.114	0.115
	(0.049)	(0.049)	(0.124)	(0.124)	(0.124)	(0.124)
Commune characteristics						
Access to car road	-0.293***	-0.309***	-0.123	-0.123	-0.127	-0.122
	(0.087)	(0.087)	(0.139)	(0.139)	(0.139)	(0.141)
Access to public transport	0.041	0.042	-0.008	-0.008	-0.008	-0.009
	(0.031)	(0.031)	(0.037)	(0.037)	(0.037)	(0.037)
Access to electricity	0.117	0.110	0.179	0.180	0.183	0.181
	(0.083)	(0.083)	(0.136)	(0.136)	(0.135)	(0.134)

Access to post office	-0.053	-0.052	0.013	0.013	0.013	0.014
	(0.049)	(0.050)	(0.060)	(0.060)	(0.060)	(0.060)
Access to market	-0.035	-0.032	-0.126**	-0.126**	-0.127**	-0.127**
	(0.031)	(0.031)	(0.051)	(0.051)	(0.051)	(0.051)
Observations	4574	4574	4574	4574	4574	4574
Number of households	2287	2287	2287	2287	2287	2287
Adjusted R^2	0.295	0.292				
Kleibergen-Paap rk LM statistic					119.833	83.679
Cragg-Donald Wald F statistic					401.935	226.972

Notes: Robust standard errors are in parentheses. Statistical significance at the 1, 5, and 10 percent levels is indicated by ***, **, and *, respectively.

For the impact estimations, the study also reports the effects of other explanatory variables on household income from profits. It could be seen that household assets, as captured by household size, total land used and managed, share of farming labour, appear to drive household profits. The positive coefficients on total land indicate that households that have more production land tend to gain higher profits, confirming the important role of land as a primary input of rural households. Since most rural households are involved in agriculture, forestry or aquaculture activities, with a proportion of over 60% in 2011 (See more in Appendix E), it is reasonable that having more land could generate higher profits. Besides, the positive coefficients on household size and negative coefficients on household size square suggest a non-linear relationship between the number of household members and the household profits (i.e. the effect of the household size could be positive up until a certain level, and then negative thereafter). The negative coefficients on the share of dependence members show that household with higher ratio of members who do not belong to the working force tends to achieve a lower profit.

For further assessment of the impact on household profits across groups of households, the study conducts heterogeneity analysis by gender, and education level of household head. The estimation results presented in Table 5.5 suggest that for the

first period 2004-2006, the positive impacts of microcredit participation were driven by households whose head is male. However, the contradictory estimates for the panel 2010-2012 makes it less convincing to conclude which group the microcredit programme has more positive impact on.

In terms of education level of the household head, the study classifies households into two groups: 'Low' refers to those households whose head does not have any education degree, or has primary or lower-secondary education degree, and 'High' for those households whose head has upper-secondary school degree and above, for example, bachelor, master, or Ph.D. Estimates in panel B suggest there is no much evidence about the different impacts of the programme across groups, except for the period 2004-2006, when the positive impacts were driven by the 'Low' group.

Table 5.5: Estimations of Impact of Credit Participation on Household Profits, Stratified by Gender and Education of Household Head
Dependent variable is log of household income from profits

	Household and Commune Fixed-effects with Instrumental Variable					
	Panel 2004-2006		Panel 2006-2008		Panel 2010-2012	
Panel A: By gender of household head						
	Female	Male	Female	Male	Female	Male
Programme participation	-0.138	0.202**	-0.322	0.175	0.797**	-0.086
	(0.292)	(0.085)	(0.280)	(0.107)	(0.378)	(0.114)
Credit amount (VND million)	-0.027	0.045**	-0.061	0.036	0.152**	-0.015
	(0.057)	(0.019)	(0.051)	(0.022)	(0.077)	(0.020)
Number of observations	966	4518	964	4352	726	3756
Number of households	483	2259	482	2176	363	1878
Panel B: By education of household head						
	Low	High	Low	High	Low	High
Programme participation	0.201**	-0.417	0.052	0.198	0.044	0.135
	(0.088)	(0.282)	(0.103)	(0.351)	(0.118)	(0.535)
Credit amount (VND million)	0.045**	-0.059	0.011	0.026	0.008	0.223
	(0.020)	(0.039)	(0.022)	(0.048)	(0.021)	(0.090)
Number of observations	4986	482	4742	534	3514	412
Number of households	2493	241	2371	267	1757	206

Notes: Robust standard errors are in parentheses. Statistical significance at the 1, 5, and 10 percent levels is indicated by ***, **, and *, respectively.

The study also employs the same strategy to estimate the impact of microcredit on household consumption expenditure and food consumption expenditure. The estimation results, however, are not statistically significant and not consistent over time.

It could be found from the analysis that, the microcredit programme was to bring about the positive impacts to beneficiary's household welfare, in terms of income from profits. However, this positive effect became statistically insignificant for the later years. The study also found no evidence of microcredit impacts on household consumption expenditure and food consumption expenditure.

These findings, in line with other above-mentioned studies, imply that simply solely providing the credit at lower interest rates without collateral to poor households is not enough to help them improve their welfare. According to Khandker (1998), the usefulness of microcredit as a tool for reducing poverty depends much on the local circumstances. Unemployment or under-employment (i.e. low productivity) are the two intermediate determinants of poverty. If poverty results from unemployment, creating jobs is more appropriate. If poverty results from under-employment, increasing productivity through training or capital investment is more important. In this sense, for households in the rural areas of Vietnam, who are mostly working in the farming sector with low productivity of less than VND 29 million (approximately US$1,300) per capita per year (See more in Appendix F), providing non-financial support, including training besides the credit will be likely to contribute greatly to the effectiveness of microcredit programmes in poverty reduction. Training programmes could be listed as a mandatory condition of the loan to help the poor utilize their capital resource as suggested by Richardson (2000).

6. CONCLUSION AND POLICY IMPLICATIONS

The study examines the poverty targeting and the impact of the governmental preferential credit programme for the poor from Vietnam Bank for Social Policies. The programme is designed to provide the credit at low interest rates without collateral. Using data from Vietnam Household Living Standards Surveys from 2004 to 2012, restricted to rural sample only, it is found that, the programme has insufficiently targeted the poor, with a large number of ineligible households participating in the programme and enjoying the larger amount of credit, in spite of higher average interest rate. Likewise, the programme failed to target the poorer strata of the rural households, that is, clients of the programme are close to median group, instead of the poorest group, in terms of income from profits per capita, consumption expenditure and food consumption expenditure per capita, as well as durable and socio-economic score. The analysis from group targeting also suggests if the bank could control for the leakage problem, the programme will be better reaching the poorer strata of the commune, albeit the poorest group is still excluded. In order to improve the poverty targeting, the Vietnam Bank for Social Policies and the Government should have measures to reduce the inclusion error rate, that is, to control for the participation of ineligible households in the programme while keeping the programme effective. Further studies on the lending system, the group-lending method, and the classification procedure for poor households, as well as the local selection procedure for the list of eligible applicants, should be carried out to have more detailed suggestions for the programme modification.

The study also examines the impacts of participating in the microfinance programme on rural household welfare, in terms of household income from profits, consumption expenditure and food consumption expenditure using three different

panels: 2004-2006, 2006-2008, and 2010-2012. Estimation results suggest that the governmental microfinance programme has statistically significant positive impact on household income from profits using panel 2004-2006. However, the study finds no evidence on the significant effect of the programme in the two periods 2006-2008, and 2010-2012, although the estimation results still suggest a positive effect. The study also finds no evidence on the effect of this programme on household consumption expenditure and food consumption expenditure. These findings, in line with other studies, suggest that the effectiveness of microcredit on poverty reduction depends on local circumstance. Vietnam Bank for Social Policies, besides providing preferential credit, should implement the training programmes to help poor households utilize the full potential of their financial resource in generating higher income from agricultural and non-agricultural production activities. These training programmes, however, are costly, which could lead to higher transaction costs, affecting the financial effectiveness of the bank. Further studies on the impact of the governmental microcredit programmes, in combination with training programmes, should be put more priority.

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APPENDIXES

Appendix A: Funding Sources and Portfolio of Vietnam Bank for Social Policies (2004~2014), VND billion

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Capital	**15,529**	**20,219**	**25,405**	**36,052**	**54,691**	**74,485**	**91,897**	**107,087**	**122,260**	**129,210**	**136,450**
-State budget	4,877	5,977	7,953	9,731	12,101	17,131	19,202	20,236	26,903	26,903	25,071
-Other liabilities	10,652	14,242	17,452	26,321	42,590	57,354	72,695	86,851	95,357	102,307	111,379
Outstanding Loans	**14,302**	**18,426**	**24,140**	**34,940**	**52,511**	**72,660**	**89,462**	**103,731**	**113,921**	**121,699**	**129,456**
-Poor households	11,609	14,891	19,196	23,271	27,456	32,402	36,166	38,482	41,560	41,650	39,252
-Disadvantaged students	133	157	217	2,807	9,741	18,231	26,052	33,446	35,802	34,262	29,794
-Business and production households living in specially disadvantaged areas and communes				2,393	6,250	9,249	10,310	11,015	12,871	13,167	13,961
-Safe water and rural environment sanitation	123	328	789	1,717	3,544	5,497	6,957	8,540	10,631	12,116	15,386
-Near-poor households										7,110	17,140
-Job creation	2,259	2,569	2,848	3,159	3,532	4,025	4,597	5,204	5,663	5,959	6,284
-Housing for the poor						766	2,208	3,335	3,833	3,810	3,766
-Migrant workers	71	252	545	662	796	791	816	728	560	446	460
-Housing purpose with deferred payment	105	178	342	507	556	580	598	686	743	923	1,049
-Extremely disadvantaged ethnic minorities				86	217	359	431	534	496	546	549
-Forest sector development		5	32	64	119	179	274	348	388	452	551
-Small and medium enterprise development		30	67	137	140	192	211	195	176	169	133
-Others	2	16	104	137	160	389	842	1,218	1,198	1,089	1,131
Credit Quality (Delinquency and frozen debts/Total outstanding loans)										1.08%	0.88%

Source: Summary from Vietnam Bank for Social Policies Annual Reports 2004-2014

Appendix B: List of Assets Used to Compute Wealth Level

Access to utilities

1 National electricity

Ownership of durable assets

1 Automobile(s)
2 Motorbike(s)
3 Bicycle(s)
4 Ship(s), boat(s), junk(s), outer part with motor
5 Ship(s), boat(s), junk(s), outer part without motor
6 Other means of travel
7 Pumping machine(s)
8 Electricity generator(s)
9 Printer(s)
10 Fax machine(s)
11 Sewing machine(s)
12 Video/DVD/digital player(s), satellite antenna
13 Colour TV(s)
14 Landline telephone(s)
15 Mobile phone(s)
16 Black and white TV(s)
17 Radio/radio-cassette player(s)
18 Disk player(s)
19 Computer(s)
20 Camera(s), video recorder(s)
21 Refrigerator(s)
22 Air conditioner(s)
23 Washing/drying machine(s)
24 Electric fan(s)
25 (Bath) water heater(s)
26 Gas/magnetic cooker(s)
27 Electric/pressure cooker(s)
28 Trolleys of various kinds
29 Cupboard(s), cabinet(s), wardrobe(s)
30 Bed(s)
31 Desk(s), chair(s), long bench(es), table(s)

Ownership of durable assets

32 Vacuum cleaner(s), dehumidifier(s), water filter(s)
33 Microwave oven(s), baking oven(s)
34 Juice extractor(s), citrus juicer(s)
35 Piano(s), keyboard(s)
36 Music rack of various kinds

Sanitation facility

1 Septic/semi-septic tank
2 Sulabh
3 Double septic tank
4 Fishing bridge
5 Other types
6 No toilets

Housing characteristics
(only available for vhlss 2010, 2012)

Type of poles' material

1 Reinforcement concrete
2 Bricks/stones
3 Iron/steel/good wood
4 Poor-quality wood/bamboo
5 Others

type of roofs' material

1 Reinforcement concrete
2 Tiles (cement, terracotta)
3 Slabs (cement, metal)
4 Leave/straw/rolled roofing
5 Others

Type of walls' material

1 Reinforcement concrete
2 Bricks/stones
3 Wood/metal
4 Calcareous soil/straw
5 Bamboo partitions/hardboards
6 Others

Appendix C: Results of Principal Component Analysis for Socio-Economic Score

Variable description	2004			2006			2008		
	Mean	Standard Deviation	Factor Score	Mean	Standard Deviation	Factor Score	Mean	Standard Deviation	Factor Score
Access to utilities									
National electricity	0.900	0.299	0.175	0.935	0.246	0.160	0.957	0.202	0.157
Ownership of durable assets									
Automobile(s)	0.004	0.065	0.073	0.006	0.077	0.059	0.011	0.103	0.091
Motorbike(s)	0.422	0.494	0.241	0.528	0.499	0.230	0.639	0.480	0.220
Bicycle(s)	0.693	0.461	0.103	0.672	0.469	0.089	0.664	0.472	0.122
Ship(s), boat(s), junk(s), outer part with a motor	0.055	0.228	-0.003	0.048	0.214	0.026	0.048	0.213	0.024
Ship(s), boat(s), junk(s), outer part without a motor	0.043	0.202	-0.016	0.035	0.183	-0.013	0.030	0.170	-0.006
Other means of travel	0.008	0.090	0.018	0.007	0.081	0.027	0.007	0.083	0.034
Pumping machine(s)	0.338	0.473	0.197	0.358	0.479	0.203	0.442	0.497	0.206
Electricity generator(s)	0.017	0.129	-0.030	0.014	0.116	-0.012	0.014	0.117	0.012
Printer(s)	0.001	0.024	0.038	0.001	0.038	0.057	0.002	0.047	0.044
Fax machine(s)	0.000	0.012	0.031	0.000	0.012	0.031	0.000	0.021	0.032
Sewing machine(s)	0.084	0.277	0.069	0.075	0.264	0.072	0.074	0.262	0.043
Video/DVD/digital player(s), satellite antenna	0.256	0.437	0.239	0.389	0.488	0.222	0.502	0.500	0.206
Colour TV(s)	0.600	0.490	0.284	0.723	0.448	0.263	0.839	0.368	0.245
Landline telephone(s)	0.105	0.306	0.268	0.184	0.387	0.269	0.373	0.484	0.246
Mobile phone(s)	0.022	0.146	0.178	0.091	0.287	0.222	0.350	0.477	0.231
Black and white TV(s)	0.123	0.329	-0.119	0.077	0.267	-0.108	0.030	0.172	-0.086
Radio/radio-cassette player(s)	0.198	0.399	0.029	0.115	0.319	0.035	0.064	0.245	0.026
Disk player(s)	0.017	0.131	0.059	0.022	0.147	0.042	0.032	0.176	0.024
Computer(s)	0.016	0.125	0.153	0.026	0.159	0.154	0.045	0.207	0.156

Camera(s), video recorder(s)	0.005	0.072	0.098	0.006	0.075	0.092	0.006	0.080	0.076
Refrigerator(s)	0.069	0.254	0.242	0.114	0.318	0.247	0.196	0.397	0.257
Air conditioner(s)	0.002	0.045	0.099	0.003	0.058	0.101	0.008	0.089	0.112
Washing/drying machine(s)	0.011	0.103	0.163	0.019	0.137	0.167	0.038	0.191	0.177
Electric fan(s)	0.730	0.444	0.219	0.768	0.422	0.213	0.810	0.392	0.203
(Bath) water heater(s)	0.010	0.099	0.145	0.016	0.125	0.146	0.038	0.190	0.166
Gas/magnetic cooker(s)	0.172	0.377	0.259	0.246	0.430	0.278	0.343	0.475	0.272
Electric/pressure cooker(s)	0.405	0.491	0.268	0.501	0.500	0.261	0.627	0.484	0.251
Trolleys of various kinds	0.005	0.068	0.023	0.006	0.080	0.032	0.010	0.099	0.036
Cupboard(s), cabinet(s), wardrobe(s) of various kinds	0.726	0.446	0.212	0.753	0.432	0.216	0.797	0.402	0.223
Bed(s)	0.886	0.318	0.142	0.887	0.317	0.137	0.890	0.313	0.145
Desk(s), chair(s), long bench(es), dressing table(s)	0.621	0.485	0.187	0.633	0.482	0.197	0.667	0.471	0.201
Vacuum cleaner(s), dehumidifier(s), water filter(s)	0.002	0.049	0.044	0.003	0.058	0.045	0.005	0.072	0.078
Microwave oven(s), baking oven(s)	0.001	0.029	0.061	0.002	0.045	0.073	0.006	0.075	0.099
Juice extractor(s), citrus juicer(s)	0.022	0.146	0.164	0.036	0.186	0.166	0.054	0.226	0.161
Piano(s), keyboard(s)	0.060	0.238	0.045	0.056	0.230	0.044	0.131	0.337	0.097
Music rack of various kinds	0.061	0.240	0.160	0.101	0.301	0.158	0.136	0.343	0.143
Sanitation facility									
Septic/semi-septic tank	0.127	0.333	0.230	0.176	0.381	0.236	0.239	0.426	0.235
Sulabh	0.027	0.161	0.075	0.039	0.193	0.063	0.048	0.214	0.057
Double septic tank	0.226	0.419	0.051	0.237	0.425	0.017	0.231	0.421	0.006
Fishing bridge	0.134	0.340	-0.025	0.133	0.340	-0.023	0.121	0.327	-0.017
Other types	0.306	0.461	-0.112	0.266	0.442	-0.119	0.225	0.418	-0.134
No toilets	0.180	0.384	-0.130	0.149	0.356	-0.138	0.135	0.342	-0.156
Largest Eigenvalue		**5.27**			**5.42**			**5.45**	
Proportion of Variance Explained		**12.25%**			**12.61%**			**12.67%**	

Variable description	2010			2012		
	Mean	S.D.	Factor Score	Mean	S.D	Factor Score
Access to utilities						
National electricity	0.953	0.211	0.163	0.956	0.206	0.162
Ownership of durable assets						
Automobile(s)	0.004	0.063	0.040	0.007	0.082	0.052
Motorbike(s)	0.712	0.453	0.152	0.764	0.425	0.137
Bicycle(s)	0.565	0.496	0.145	0.544	0.498	0.143
Ship(s), boat(s), junk(s), outer part with a motor	0.028	0.165	-0.003	0.028	0.164	-0.010
Ship(s), boat(s), junk(s), outer part without a motor	0.018	0.133	-0.012	0.016	0.124	-0.011
Other means of travel	0.002	0.045	0.008	0.001	0.030	0.007
Pumping machine(s)	0.455	0.498	0.200	0.467	0.499	0.190
Electricity generator(s)	0.026	0.159	0.021	0.024	0.153	0.001
Printer(s)	0.006	0.077	0.047	0.007	0.082	0.043
Fax machine(s)	0.000	0.021	0.007	0.000	0.021	0.021
Sewing machine(s)	0.050	0.218	0.012	0.041	0.197	0.002
Video/DVD/digital player(s), satellite antenna	0.545	0.498	0.152	0.512	0.500	0.137
Colour TV(s)	0.848	0.359	0.204	0.881	0.324	0.191
Landline telephone(s)	0.306	0.461	0.148	0.171	0.377	0.109
Mobile phone(s)	0.632	0.482	0.176	0.759	0.428	0.176
Black and white TV(s)	0.016	0.124	-0.052	0.010	0.100	-0.046
Radio/radio-cassette player(s)	0.044	0.204	0.028	0.029	0.169	0.008
Disk player(s)	0.024	0.153	0.013	0.019	0.137	0.023
Computer(s)	0.074	0.262	0.130	0.088	0.283	0.133
Camera(s), video recorder(s)	0.010	0.098	0.064	0.011	0.102	0.066
Refrigerator(s)	0.289	0.453	0.212	0.364	0.481	0.228
Air conditioner(s)	0.015	0.121	0.089	0.022	0.146	0.100
Washing/drying machine(s)	0.065	0.246	0.144	0.106	0.308	0.166
Electric fan(s)	0.805	0.397	0.219	0.834	0.372	0.212
(Bath) water heater(s)	0.057	0.232	0.145	0.084	0.278	0.158
Gas/magnetic cooker(s)	0.484	0.500	0.234	0.575	0.494	0.249
Electric/pressure cooker(s)	0.692	0.462	0.238	0.738	0.440	0.245
Trolleys of various kinds	0.010	0.101	0.033	0.010	0.099	0.037
Cupboard(s), cabinet(s), wardrobe(s)	0.747	0.435	0.202	0.798	0.401	0.210
Bed(s)	0.816	0.388	0.149	0.886	0.318	0.157
Desk(s), chair(s), long bench(es), dressing table(s)	0.609	0.488	0.207	0.660	0.474	0.210
Vacuum cleaner(s), dehumidifier(s), water filter(s)	0.007	0.085	0.057	0.011	0.103	0.063
Microwave oven(s), baking oven(s)	0.010	0.098	0.073	0.010	0.102	0.069
Juice extractor(s), citrus juicer(s)	0.085	0.279	0.143	0.098	0.297	0.143
Piano(s), keyboard(s)	0.002	0.040	0.027	0.001	0.035	0.013
Music rack of various kinds	0.117	0.322	0.099	0.115	0.318	0.099
Sanitation facility						
Septic/semi-septic tank	0.331	0.471	0.200	0.397	0.489	0.213
Sulabh	0.043	0.203	0.033	0.039	0.192	0.027
Double septic tank	0.183	0.386	0.054	0.161	0.368	0.028

Fishing bridge	0.133	0.340	-0.086	0.118	0.323	-0.066
Other types	0.200	0.400	-0.121	0.198	0.398	-0.144
No toilets	0.110	0.313	-0.140	0.087	0.282	-0.146
Housing characteristics						
Type of poles' material						
Reinforcement concrete	0.222	0.415	0.097	0.262	0.440	0.122
Bricks/stones	0.464	0.499	0.155	0.444	0.497	0.122
Iron/steel/good wood	0.166	0.372	-0.145	0.147	0.354	-0.135
Poor-quality wood/bamboo	0.141	0.348	-0.176	0.141	0.348	-0.186
Others	0.007	0.080	-0.026	0.004	0.066	-0.023
Type of roof's material						
Reinforcement concrete	0.133	0.340	0.145	0.140	0.347	0.143
Tiles (cement, terracotta)	0.372	0.483	0.047	0.362	0.481	0.034
Slabs (cement, metal)	0.428	0.495	-0.082	0.451	0.498	-0.088
Leave/straw/rolled roofing	0.059	0.236	-0.123	0.044	0.205	-0.103
Others	0.006	0.080	-0.031	0.002	0.047	-0.026
Type of walls' material						
Reinforcement concrete	0.017	0.128	0.036	0.019	0.137	0.036
Bricks/stones	0.665	0.472	0.257	0.688	0.464	0.249
Wood/metal	0.150	0.357	-0.141	0.153	0.360	-0.160
Calcareous soil/straw	0.034	0.181	-0.071	0.031	0.174	-0.082
Bamboo partitions/hardboards	0.064	0.244	-0.139	0.058	0.233	-0.133
Others	0.069	0.254	-0.111	0.051	0.220	-0.081
Largest Eigenvalue		**6.87**			**7.13**	
Proportion of Variance Explained		**11.65%**			**12.09%**	

Appendix D: Internal Validity of Principle Component Analysis

Year 2004	Poorest	2	3	4	Richest
Access to utilities					
National electricity	57.64%	94.38%	98.92%	99.50%	99.78%
Ownership of durable assets					
Automobile(s)	0.00%	0.00%	0.07%	0.07%	1.95%
Motorbike(s)	8.50%	18.44%	37.03%	60.35%	86.81%
Bicycle(s)	40.13%	66.35%	78.82%	83.42%	77.58%
Ship(s), boat(s), junk(s), outer part with a motor	5.91%	5.12%	5.12%	5.34%	5.91%
Ship(s), boat(s), junk(s), outer part without a motor	4.76%	4.61%	4.61%	4.97%	2.38%
Other means of travel	0.22%	0.36%	0.65%	1.44%	1.44%
Pumping machine(s)	3.75%	14.70%	31.34%	52.70%	66.47%
Electricity generator(s)	4.97%	0.94%	0.72%	0.43%	1.37%
Printer(s)	0.00%	0.00%	0.00%	0.00%	0.29%
Fax machine(s)	0.00%	0.00%	0.00%	0.00%	0.07%
Sewing machine(s)	4.54%	4.90%	6.20%	9.88%	16.51%
Video/DVD/digital player(s), satellite antenna	0.72%	4.18%	14.34%	40.81%	68.06%
Colour TV(s)	3.53%	29.18%	72.69%	95.67%	99.21%
Landline telephone(s)	0.00%	0.22%	0.50%	3.46%	48.31%
Mobile phone(s)	0.00%	0.00%	0.00%	0.14%	10.74%
Black and white TV(s)	27.52%	23.13%	8.29%	2.02%	0.58%
Radio/radio-cassette player(s)	15.42%	20.32%	18.37%	21.20%	23.72%
Disk player(s)	0.22%	0.50%	1.37%	1.59%	5.05%
Computer(s)	0.07%	0.00%	0.00%	0.43%	7.43%
Camera(s), video recorder(s)	0.00%	0.00%	0.00%	0.07%	2.52%
Refrigerator(s)	0.00%	0.00%	0.36%	1.95%	32.44%
Air conditioner(s)	0.00%	0.00%	0.00%	0.00%	1.01%
Washing/drying machine(s)	0.00%	0.07%	0.07%	0.00%	5.26%
Electric fan(s)	21.04%	68.59%	85.23%	94.74%	95.46%
(Bath) water heater(s)	0.00%	0.00%	0.00%	0.07%	4.90%
Gas/magnetic cooker(s)	0.43%	2.88%	5.69%	14.06%	62.87%
Electric/pressure cooker(s)	0.86%	12.54%	34.58%	65.54%	88.90%
Trolleys of various kinds	0.00%	0.36%	0.50%	0.50%	0.94%
Cupboard(s), cabinet(s), wardrobe(s)	28.39%	60.66%	83.79%	93.37%	96.97%
Bed(s)	62.25%	90.99%	95.32%	97.26%	97.19%
Desk(s), chair(s), long bench(es), dressing table(s)	19.81%	54.32%	70.39%	79.60%	86.45%
Vacuum cleaner(s), dehumidifier(s), water filter(s)	0.00%	0.00%	0.22%	0.14%	0.87%
Microwave oven(s), baking oven(s)	0.00%	0.00%	0.00%	0.00%	0.43%
Juice extractor(s), citrus juicer(s)	0.00%	0.00%	0.07%	0.43%	10.38%
Piano(s), keyboard(s)	2.52%	4.61%	5.91%	8.36%	8.80%
Music rack of various kinds	0.36%	0.50%	1.80%	5.34%	22.71%
Sanitation facility					
Septic/semi-septic tank	0.07%	1.59%	3.96%	12.55%	45.57%
Sulabh	0.43%	0.50%	1.66%	2.67%	8.00%
Double septic tank	3.46%	18.23%	30.84%	38.50%	22.21%

Fishing bridge	12.75%	16.35%	14.41%	14.78%	8.51%
Other types	44.52%	41.28%	33.14%	22.28%	11.61%
No toilets	38.76%	22.05%	15.99%	9.23%	4.11%
Average SES Index (Mean Scores for First Principal Component)	**-2.724**	**-1.327**	**-0.231**	**0.866**	**3.419**

Year 2006	Poorest	2	3	4	Richest
Access to utilities					
National electricity	70.73%	97.82%	99.64%	99.71%	99.78%
Ownership of durable assets					
Automobile(s)	0.00%	0.07%	0.07%	0.44%	2.40%
Motorbike(s)	15.90%	27.76%	53.67%	74.58%	92.07%
Bicycle(s)	40.67%	65.77%	77.78%	78.43%	73.53%
Ship(s), boat(s), junk(s), outer part with a motor	2.54%	3.13%	5.16%	5.95%	7.35%
Ship(s), boat(s), junk(s), outer part without a motor	4.50%	3.42%	3.27%	3.49%	2.76%
Other means of travel	0.00%	0.44%	0.29%	1.09%	1.53%
Pumping machine(s)	3.99%	17.30%	33.55%	55.92%	68.15%
Electricity generator(s)	3.63%	0.80%	0.36%	0.22%	1.82%
Printer(s)	0.00%	0.00%	0.07%	0.07%	0.58%
Fax machine(s)	0.00%	0.00%	0.00%	0.00%	0.07%
Sewing machine(s)	4.43%	3.13%	4.65%	8.86%	16.51%
Video/DVD/digital player(s), satellite antenna	3.78%	16.86%	39.22%	59.40%	75.49%
Colour TV(s)	11.33%	61.70%	92.16%	96.88%	99.27%
Landline telephone(s)	0.15%	0.73%	4.14%	18.74%	68.07%
Mobile phone(s)	0.15%	0.36%	1.23%	5.66%	37.89%
Black and white TV(s)	21.93%	12.28%	2.54%	1.31%	0.65%
Radio/radio-cassette player(s)	10.38%	8.79%	9.44%	12.71%	16.15%
Disk player(s)	0.44%	0.87%	2.18%	3.34%	4.15%
Computer(s)	0.00%	0.07%	0.36%	1.02%	11.56%
Camera(s), video recorder(s)	0.00%	0.07%	0.00%	0.00%	2.76%
Refrigerator(s)	0.07%	0.51%	1.60%	6.61%	48.15%
Air conditioner(s)	0.00%	0.00%	0.00%	0.00%	1.67%
Washing/drying machine(s)	0.00%	0.15%	0.00%	0.29%	9.09%
Electric fan(s)	30.21%	73.98%	89.62%	93.25%	97.09%
(Bath) water heater(s)	0.00%	0.07%	0.00%	0.07%	7.78%
Gas/magnetic cooker(s)	0.58%	2.33%	7.77%	32.39%	79.78%
Electric/pressure cooker(s)	3.99%	24.27%	52.51%	78.50%	91.42%
Trolleys of various kinds	0.07%	0.36%	0.44%	0.58%	1.75%
Cupboard(s), cabinet(s), wardrobe(s)	30.72%	66.28%	87.94%	94.55%	96.80%
Bed(s)	65.29%	89.68%	95.57%	96.59%	96.36%
Desk(s), chair(s), long bench(es), dressing table(s)	21.86%	54.14%	70.37%	81.70%	88.65%
Vacuum cleaner(s), dehumidifier(s), water filter(s)	0.00%	0.00%	0.07%	0.22%	1.38%
Microwave oven(s), baking oven(s)	0.00%	0.00%	0.00%	0.00%	1.02%
Juice extractor(s), citrus juicer(s)	0.07%	0.00%	0.22%	1.09%	16.51%
Piano(s), keyboard(s)	2.76%	3.85%	5.52%	7.26%	8.51%
Music rack of various kinds	0.36%	1.89%	5.01%	13.80%	29.24%
Sanitation facility					
Septic/semi-septic tank	0.29%	2.69%	6.75%	21.93%	56.51%
Sulabh	0.58%	1.38%	2.11%	6.54%	8.73%
Double septic tank	7.77%	27.11%	34.50%	32.39%	16.65%
Fishing bridge	13.44%	16.50%	13.22%	13.80%	9.67%
Other types	40.52%	37.21%	30.86%	18.30%	6.25%

No toilets	37.40%	15.12%	12.56%	6.97%	2.18%
Average SES Index (Mean Scores for First Principal Component)	**-2.940**	**-1.313**	**-0.177**	**0.969**	**3.464**

Year 2008	Poorest	2	3	4	Richest
Access to utilities					
National electricity	80.50%	98.68%	99.78%	99.78%	99.93%
Ownership of durable assets					
Automobile(s)	0.00%	0.07%	0.00%	0.80%	4.54%
Motorbike(s)	25.86%	44.58%	68.20%	86.47%	94.59%
Bicycle(s)	34.11%	65.89%	79.46%	77.76%	75.05%
Ship(s), boat(s), junk(s), outer part with a motor	2.12%	4.47%	4.82%	6.58%	5.93%
Ship(s), boat(s), junk(s), outer part without a motor	2.63%	3.29%	3.44%	3.22%	2.27%
Other means of travel	0.00%	0.22%	0.15%	1.10%	1.98%
Pumping machine(s)	7.89%	24.60%	50.44%	63.42%	74.69%
Electricity generator(s)	2.70%	0.44%	0.15%	0.44%	3.22%
Printer(s)	0.00%	0.00%	0.00%	0.00%	1.10%
Fax machine(s)	0.00%	0.00%	0.00%	0.00%	0.22%
Sewing machine(s)	5.33%	4.69%	5.70%	8.34%	12.95%
Video/DVD/digital player(s), satellite antenna	12.42%	33.46%	55.92%	69.79%	79.37%
Colour TV(s)	35.06%	87.55%	97.88%	99.27%	99.56%
Landline telephone(s)	3.58%	14.42%	30.92%	54.13%	83.47%
Mobile phone(s)	3.87%	14.28%	30.26%	49.45%	76.96%
Black and white TV(s)	11.32%	2.34%	0.95%	0.29%	0.29%
Radio/radio-cassette player(s)	5.99%	4.54%	4.17%	7.90%	9.36%
Disk player(s)	1.53%	2.71%	3.36%	4.54%	3.95%
Computer(s)	0.00%	0.22%	0.37%	2.27%	19.68%
Camera(s), video recorder(s)	0.00%	0.07%	0.07%	0.29%	2.78%
Refrigerator(s)	0.29%	1.61%	5.41%	19.39%	71.54%
Air conditioner(s)	0.00%	0.00%	0.00%	0.07%	3.88%
Washing/drying machine(s)	0.00%	0.15%	0.00%	0.59%	18.22%
Electric fan(s)	40.83%	81.84%	92.40%	94.37%	95.68%
(bath) water heater(s)	0.00%	0.07%	0.22%	0.88%	17.63%
Gas/magnetic cooker(s)	1.31%	8.35%	20.32%	54.21%	87.13%
Electric/pressure cooker(s)	12.78%	46.85%	72.88%	86.32%	94.73%
Trolleys of various kinds	0.07%	0.44%	1.02%	1.02%	2.41%
Cupboard(s), cabinet(s), wardrobe(s)	35.65%	77.60%	91.59%	96.20%	97.51%
Bed(s)	66.62%	90.19%	96.13%	95.32%	96.93%
Desk(s), chair(s), long bench(es), dressing table(s)	27.25%	56.59%	74.63%	84.35%	90.56%
Vacuum cleaner(s), dehumidifier(s), water filter(s)	0.00%	0.00%	0.07%	0.07%	2.49%
Microwave oven(s), baking oven(s)	0.00%	0.00%	0.00%	0.00%	2.85%
Juice extractor(s), citrus juicer(s)	0.00%	0.37%	0.80%	3.07%	22.68%
Piano(s), keyboard(s)	5.04%	7.91%	10.38%	16.17%	26.04%
Music rack of various kinds	0.88%	5.34%	9.28%	18.73%	33.94%
Sanitation facility					
Septic/semi-septic tank	1.46%	4.98%	12.65%	32.33%	68.03%
Sulabh	0.80%	2.49%	3.95%	7.24%	9.58%
Double septic tank	10.88%	25.18%	36.99%	30.87%	11.49%
Fishing bridge	9.06%	17.20%	15.35%	12.87%	6.22%
Other types	40.91%	33.67%	22.44%	12.36%	3.29%

No toilets	36.89%	16.47%	8.63%	4.32%	1.39%
Average SES Index (Mean Scores for First Principal Component)	**-3.238**	**-1.195**	**0.010**	**1.144**	**3.282**

Year 2010	Poorest	2	3	4	Richest
Access to utilities					
National electricity	77.93%	99.19%	99.78%	99.78%	100.00%
Ownership of durable assets					
Automobile(s)	0.07%	0.07%	0.00%	0.07%	1.78%
Motorbike(s)	45.19%	60.67%	68.44%	85.41%	96.37%
Bicycle(s)	23.19%	47.78%	63.41%	73.33%	74.89%
Ship(s), boat(s), junk(s), outer part with a motor	2.37%	3.85%	3.19%	2.59%	2.00%
Ship(s), boat(s), junk(s), outer part without a motor	2.74%	2.00%	1.56%	1.78%	0.96%
Other means of travel	0.15%	0.07%	0.15%	0.22%	0.44%
Pumping machine(s)	8.07%	27.26%	45.85%	64.44%	82.07%
Electricity generator(s)	3.93%	0.59%	0.67%	1.04%	6.74%
Printer(s)	0.00%	0.15%	0.07%	0.22%	2.52%
Fax machine(s)	0.00%	0.07%	0.00%	0.07%	0.07%
Sewing machine(s)	4.74%	3.93%	3.63%	5.33%	7.41%
Video/DVD/digital player(s), satellite antenna	25.85%	47.41%	48.81%	67.19%	83.26%
Colour TV(s)	49.93%	82.37%	94.22%	98.37%	99.33%
Landline telephone(s)	7.93%	18.74%	28.74%	36.44%	61.19%
Mobile phone(s)	28.22%	55.11%	61.11%	81.11%	90.44%
Black and white TV(s)	4.96%	1.33%	0.96%	0.37%	0.22%
Radio/radio-cassette player(s)	3.04%	3.70%	2.96%	4.30%	7.85%
Disk player(s)	1.85%	1.93%	2.22%	3.19%	2.74%
Computer(s)	0.15%	1.70%	2.22%	5.70%	27.33%
Camera(s), video recorder(s)	0.00%	0.07%	0.00%	0.59%	4.15%
Refrigerator(s)	1.33%	9.48%	19.11%	35.85%	78.59%
Air conditioner(s)	0.00%	0.00%	0.00%	0.44%	7.04%
Washing/drying machine(s)	0.07%	0.22%	1.56%	3.48%	27.04%
Electric fan(s)	36.30%	79.63%	91.63%	96.07%	98.67%
(bath) water heater(s)	0.07%	0.15%	0.74%	2.22%	25.48%
Gas/magnetic cooker(s)	5.04%	28.22%	44.07%	69.48%	95.19%
Electric/pressure cooker(s)	17.78%	57.85%	80.15%	92.74%	97.56%
Trolleys of various kinds	0.15%	0.44%	0.52%	1.41%	2.59%
Cupboard(s), cabinet(s), wardrobe(s)	35.26%	66.59%	80.52%	93.70%	97.26%
Bed(s)	54.59%	79.78%	86.00%	91.33%	96.15%
Desk(s), chair(s), long bench(es), dressing table(s)	17.93%	46.81%	66.07%	82.00%	91.78%
Vacuum cleaner(s), dehumidifier(s), water filter(s)	0.00%	0.22%	0.07%	0.30%	3.04%
Microwave oven(s), baking oven(s)	0.00%	0.07%	0.07%	0.07%	4.67%
Juice extractor(s), citrus juicer(s)	0.00%	1.41%	2.59%	6.89%	31.56%
Piano(s), keyboard(s)	0.00%	0.00%	0.00%	0.15%	0.67%
Music rack of various kinds	1.78%	7.48%	8.22%	13.56%	27.70%
Sanitation facility					
Septic/semi-septic tank	3.33%	14.52%	27.70%	42.44%	77.56%
Sulabh	0.74%	2.96%	5.11%	7.41%	5.33%
Double septic tank	2.59%	14.74%	29.19%	31.93%	12.81%
Fishing bridge	22.37%	26.15%	10.59%	5.85%	1.56%
Other types	39.41%	29.19%	18.81%	10.15%	2.37%

No toilets	31.56%	12.44%	8.59%	2.22%	0.30%
Housing characteristics					
Type of poles' material					
Reinforcement concrete	6.44%	17.63%	22.59%	28.15%	36.00%
Bricks/stones	7.11%	36.67%	60.15%	65.63%	62.44%
Iron/steel/good wood	41.11%	22.96%	12.52%	5.04%	1.33%
Poor-quality wood/bamboo	43.41%	21.19%	4.67%	1.04%	0.07%
Others	1.56%	1.48%	0.07%	0.07%	0.07%
Type of roof's material					
Reinforcement concrete	0.30%	1.70%	8.89%	15.93%	39.70%
Tiles (cement, terracotta)	20.15%	36.00%	48.44%	49.33%	32.22%
Slabs (cement, metal)	56.30%	54.30%	41.41%	34.15%	27.70%
Leave/straw/rolled roofing	20.96%	7.41%	0.74%	0.52%	0.07%
Others	1.93%	0.52%	0.52%	0.00%	0.22%
Type of walls' material					
Reinforcement concrete	0.15%	0.52%	2.00%	2.44%	3.19%
Bricks/stones	9.93%	48.30%	83.56%	94.67%	95.93%
Wood/metal	35.93%	26.00%	10.44%	2.00%	0.74%
Calcareous soil/straw	9.11%	6.52%	1.04%	0.30%	0.07%
Bamboo partitions/hardboards	23.63%	6.96%	1.04%	0.22%	0.00%
Others	20.89%	11.63%	1.93%	0.30%	0.00%
Average SES Index (Mean Scores for First Principal Component)	**-3.992**	**-1.264**	**0.340**	**1.581**	**3.335**

Year 2012	Poorest	2	3	4	Richest
Access to utilities					
National electricity	79.03%	99.10%	99.85%	99.93%	100.00%
Ownership of durable assets					
Automobile(s)	0.00%	0.00%	0.07%	0.45%	2.84%
Motorbike(s)	54.78%	64.30%	76.18%	89.92%	96.86%
Bicycle(s)	21.42%	46.75%	61.76%	69.75%	72.52%
Ship(s), boat(s), junk(s), outer part with a motor	2.39%	4.85%	2.84%	2.54%	1.19%
Ship(s), boat(s), junk(s), outer part without a motor	1.79%	2.69%	1.49%	1.27%	0.52%
Other means of travel	0.00%	0.00%	0.15%	0.22%	0.07%
Pumping machine(s)	9.18%	29.50%	49.37%	66.02%	79.61%
Electricity generator(s)	4.93%	0.37%	0.30%	0.60%	5.83%
Printer(s)	0.15%	0.07%	0.22%	0.22%	2.69%
Fax machine(s)	0.00%	0.00%	0.00%	0.00%	0.22%
Sewing machine(s)	4.48%	2.46%	4.18%	3.44%	5.75%
Video/DVD/digital player(s), satellite antenna	27.39%	40.63%	48.10%	59.97%	80.06%
Colour TV(s)	57.84%	87.23%	96.12%	99.48%	99.93%
Landline telephone(s)	3.81%	10.53%	13.59%	20.01%	37.57%
Mobile phone(s)	42.84%	67.81%	79.61%	92.01%	97.01%
Black and white TV(s)	3.73%	0.67%	0.45%	0.15%	0.07%
Radio/radio-cassette player(s)	2.99%	2.39%	2.76%	2.09%	4.41%
Disk player(s)	0.52%	1.64%	1.87%	2.69%	2.91%
Computer(s)	0.37%	1.49%	3.21%	6.95%	32.04%
Camera(s), video recorder(s)	0.00%	0.15%	0.07%	0.15%	4.93%
Refrigerator(s)	1.19%	13.29%	23.53%	53.17%	90.66%
Air conditioner(s)	0.00%	0.00%	0.15%	0.22%	10.46%
Washing/drying machine(s)	0.15%	0.82%	1.12%	6.42%	44.36%
Electric fan(s)	42.54%	84.24%	95.15%	97.09%	98.13%
(bath) water heater(s)	0.00%	0.07%	0.52%	3.96%	37.57%
Gas/magnetic cooker(s)	6.57%	36.45%	59.97%	86.78%	97.98%
Electric/pressure cooker(s)	19.18%	68.04%	87.53%	95.30%	98.95%
Trolleys of various kinds	0.00%	0.30%	0.67%	0.97%	2.99%
Cupboard(s), cabinet(s), wardrobe(s)	39.70%	74.01%	89.25%	97.09%	99.03%
Bed(s)	62.31%	89.99%	95.37%	97.98%	97.31%
Desk(s), chair(s), long bench(es), dressing table(s)	22.09%	52.95%	73.56%	87.15%	94.32%
Vacuum cleaner(s), dehumidifier(s), water filter(s)	0.07%	0.00%	0.22%	0.30%	4.78%
Microwave oven(s), baking oven(s)	0.00%	0.00%	0.15%	0.15%	4.93%
Juice extractor(s), citrus juicer(s)	0.00%	0.82%	3.58%	7.92%	36.74%
Piano(s), keyboard(s)	0.00%	0.07%	0.00%	0.22%	0.30%
Music rack of various kinds	1.49%	6.42%	8.14%	13.89%	27.33%
Sanitation facility					
Septic/semi-septic tank	4.93%	17.25%	32.71%	55.79%	87.68%
Sulabh	0.75%	2.91%	5.23%	6.57%	3.81%
Double septic tank	4.70%	16.95%	26.81%	25.39%	6.87%
Fishing bridge	16.42%	24.79%	12.32%	4.93%	0.67%
Other types	45.07%	28.23%	18.37%	6.20%	0.97%

No toilets	28.13%	9.86%	4.56%	1.12%	0.00%
Housing characteristics					
Type of poles' material					
Reinforcement concrete	5.30%	17.40%	28.16%	34.95%	45.41%
Bricks/stones	10.90%	39.36%	58.10%	61.09%	52.73%
Iron/steel/good wood	36.34%	20.24%	11.43%	3.73%	1.79%
Poor-quality wood/bamboo	46.34%	21.73%	2.32%	0.22%	0.07%
Others	0.97%	1.19%	0.00%	0.00%	0.00%
Type of roof's material					
Reinforcement concrete	0.22%	2.39%	8.22%	18.67%	40.33%
Tiles (cement, terracotta)	21.64%	38.39%	46.60%	45.18%	29.42%
Slabs (cement, metal)	61.19%	53.25%	44.88%	36.15%	30.25%
Leave/straw/rolled roofing	15.90%	5.68%	0.30%	0.00%	0.00%
Others	0.90%	0.22%	0.00%	0.00%	0.00%
Type of walls' material					
Reinforcement concrete	0.22%	0.45%	2.39%	2.61%	3.96%
Bricks/stones	13.13%	53.10%	86.56%	95.67%	95.37%
Wood/metal	41.49%	25.17%	7.84%	1.34%	0.45%
Calcareous soil/straw	10.22%	4.48%	0.67%	0.07%	0.15%
Bamboo partitions/hardboards	22.09%	5.45%	1.12%	0.07%	0.07%
Others	12.69%	11.28%	1.42%	0.22%	0.00%
Average SES Index (Mean Scores for First Principal Component)	-4.125	-1.238	0.428	1.633	3.305

Appendix E: Proportion of Rural Households by Economic Sectors

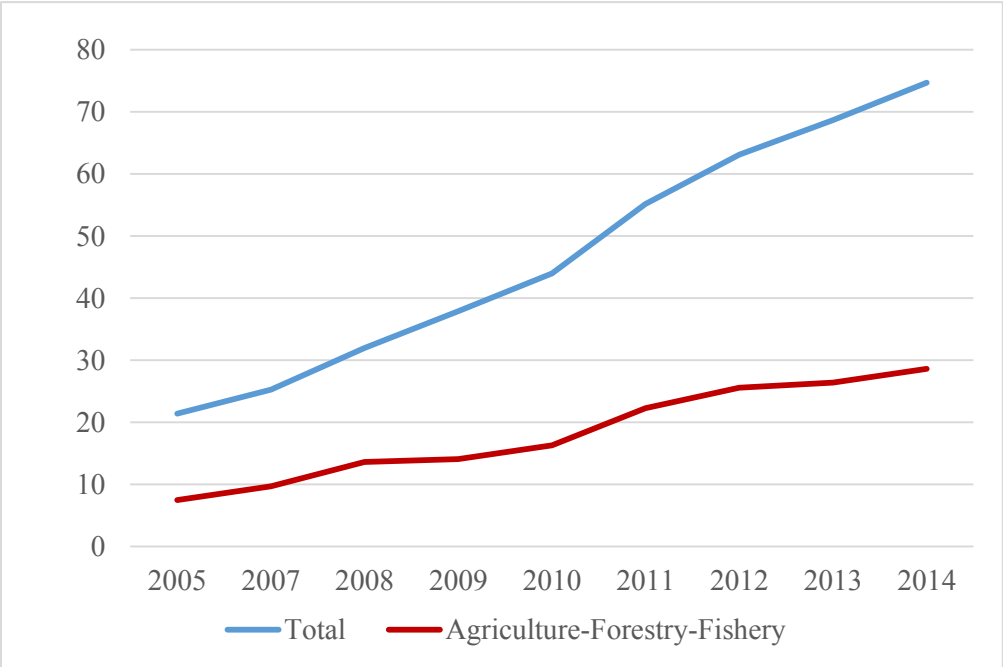
Unit: Household, %

	2001		2006		2011	
	Number	%	Number	%	Number	%
Total	13,065,756	100	1,376,472	100	15,347,921	100
Agriculture-Forestry-Fishery	10,573,756	80.9	9,783,644	71.1	9,515,835	62.1
Industry - Construction	752,204	5.8	1,401,943	10.2	2,260,870	14.7
Services	1,381,121	10.6	2,054,193	14.9	2,828,203	18.4
Others	358,704	2.7	528,692	3.8	742,993	4.8

Source: Summary of 'Rural, Agricultural and Fishery Census 2001, 2006, and 2011'

Appendix F: Social Productivity of Agriculture-Forestry-Fishery Sector

Unit: VND million/person/year



Source: General Statistics Office of Vietnam