Is microfinance an important instrument for poverty alleviation?

The impact of microcredit programs on self-employment profits in Vietnam

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Abstract

Based on a sample of rural households retrieved from the Vietnam Household Living Standard Surveys 2004 and 2006, this paper examines the impact of microcredit on household-self employment profits in Vietnam, and compares this with the impact of other (bank) credit. Using several estimation techniques, the empirical analysis reveals that neither access to microcredit nor participation in microcredit programs significantly affect household self-employment profits. In contrast, both credit from commercial banks and access to commercial bank credit have positive effects on household self-employment profits.

Keywords: impact, microcredit, self-employment profits, poverty reduction, Vietnam.

Introduction

In many developing countries microfinance programs have been introduced in the last decade. Well-known examples are the Grameen Bank in Bangladesh, Banco Sol in Bolivia and Bank Rakyat in Indonesia. Between December 1997 and December 2005 the number of people who received credit from microfinance institutions (MFIs) rose from 13.5 million to 113.3 million (84 per cent of them being women). The number of microfinance institutions increased from 618 to 3,133 during the same period (Daley-Harris, 2006). In 2007, even more than 10000 MFIs exist.

Many authors argue that microcredit can help to substantially reduce poverty (Littlefield, Morduch et al. 2003; Dunford 2006). Access to credit can contribute to a long-lasting increase in income by means of a rise in investments in income generating activities and to a possible diversification of sources of income; it can contribute to an accumulation of assets; it can reduce the vulnerability due to illness, drought and crop failures, and it can contribute to a better education, health and housing of the borrower. The potential poverty reducing effect of microfinance is also emphasized by the Norwegian Nobel Committee. This committee rewarded Mohammad Yunus, the founder of the Grameen Bank, with the Nobel Peace prize in 2006. According to the Nobel Committee microfinance can help people to break out of poverty (Norwegian Nobel Committee, 2006). However, several authors doubt that microcredit can contribute to a substantial reduction in poverty. Many critics show that microfinance does not reach the poorest of the poor (Scully, 2004), or that the poorest are deliberately excluded from microfinance programs (Simanowitz and Walter, 2002). Several critics also argue that group loans, which are often used by microfinance institutions, lead to high transaction costs since most microfinance schemes have regular group meetings (Armendáriz de Aghion and Morduch, 2000). In addition, it has been argued that the size of the needed loan often exceeds the maximum amount that can be borrowed from microfinance institutions. This especially hampers

productivity growth of agents who have invested in successful and growing projects (Khawari, 2004; Madajewitcz, 2003).

Theoretically it is thus still unclear whether microfinance really helps to reduce poverty. Empirical studies need to provide more evidence on the impact of microfinance. However, surprisingly, there are only a few solid empirical studies available on the possible effects of microcredit. Most empirical studies suffer from being anecdotal and case study driven. Recently the quality of empirical studies on the impact of microfinance has been improved (see e.g. Aghion and Morduch, 2005, chapter 8). However, the empirical evidence is still far from conclusive. Some authors find that microfinance is essential to promoting poverty reduction (e.g. Khandker, 1998; Khandker and Faruqee, 2003; see Morduch and Haley, 2002 for an extensive review), while other studies conclude that microfinance is not always an effective way out of poverty (e.g. Coleman, 1999). Khandker (2005) argues that it is not unlikely that the impact of microfinance is modest. The reason is that production activities of microcredit beneficiaries often have a low return, so that gains will be limited as credit constraints are removed. In addition, evidence suggests that the impact of microfinance remains sensitive to the choice of income indicator and the poverty line (Chen and Ravallion, 2003), and most importantly the impact evaluation technique adopted. Moreover, almost all studies focus on Bangladesh, India, and Thailand. It is far from clear whether the results for these countries can be generalised to other countries, with e.g. completely different institutions.

It appears to be extremely difficult to analyze the poverty reducing effects of microfinance. A major problem is how to measure the contribution of microcredit, e.g. since it is not clear through which mechanisms microfinance may contribute to poverty reduction. In addition, measuring the impact of microfinance is difficult when dealing with the causal role of microfinance. The problem is that the impact of microfinance on poverty needs to be isolated from the impact of

other observed and unobserved variables that affect poverty. Moreover, one needs to control for variables that drive the participation in microfinance programs and the amount of credit received. Most studies measure the impact of microcredit by comparing recipients of microfinance with a control group that has no access to microcredit. However, it may be the case that changes of the social and/or economic situation of the recipients of microcredit are not the result of microfinance. For instance, it is well-known that relatively rich agents are less risk averse than relatively poor agents. This may induce rich agents to apply for microcredit whereas poor agents do not apply. Another problem is that microfinance organizations may decide to develop their activities in relatively more wealthy regions in order to improve the probability of microfinance being successful. Obviously, this biases any comparison between recipients of microcredit and the control group (Karlan, 2001; Armendáriz de Aghion and Morduch, 2005).

This paper contributes to the empirical literature on the effectiveness of microfinance. More specifically, we examine the impact of microcredit on self-employment profits of households in Vietnam. Over the past decade, Vietnam has achieved remarkable progress in the fight against poverty. The incidence of poverty, according to the international poverty line, declined from 58 percent to 20 percent between 1993 and 2004 (Vietnam Poverty Update Report, 2007). The country's poverty reduction programs cover different dimensions of poverty including health care, education, employment and provision of credit. The true impact of credit on household welfare remains an open question, though. In recent years, Vietnam has introduced several microcredit programs that function largely through the Vietnam Bank for Social Policy (VBSP, henceforth), the Vietnam bank for Agricultural and Rural Development and other non-governmental organizations. The primary objective of these microcredit programs is to ease the credit constraints of poor rural households and to provide them with capital inputs in order to initiate or to expand self-employment activities.

Despite the importance of microcredit in Vietnam, and the introduction of microcredit schemes, there are only a few studies that have examined the impact of microcredit in Vietnam. One of the only published examples is a recent study by Nguyen (2008). This study offers some evidence of a positive impact of the governmental microcredit program initiated by the Vietnam Bank for Social Policy on household income and expenditure. However, this study uses data on microcredit for one year only.

The present paper has several special features. First, this paper focuses on rural self-employment profits. Many papers examine the impact of microfinance on household expenditures, but several authors argue that the poverty impact of microfinance can better be examined by considering the impact on self-employment productivity. The reason is that in many developing countries lack of access to productive capital is one of the main causes of poverty (Coleman, 1999). Very often the poor are involved in subsistence activities and therefore unable to generate sufficient income for savings and future investment. In addition, they are often denied credit by formal institutions. As a consequence, they hardly improve productivity and remain poor. Microcredit programs may provide a way out of this dilemma as micro credit can have an impact on household self-employment profits of households, thereby contributing to household welfare (McKernan, 2002). Since poverty in Vietnam is basically seen as a rural phenomenon and a majority of rural individuals are self-employed in a variety of informal production activities, the impact of credit on self-employment profits, once revealed positive and significant, is believed to considerably contribute to improving household welfare and thus to reducing poverty. Second, using a sample of rural households retrieved from the Vietnam Household Living Standard Surveys 2004 and 2006, we estimate the impact of credit on household profits using different impact evaluation approaches. We first look at the average impact of having access to microcredit by comparing profits of households who are eligible to microcredit, with those who are not eligible for microcredit. We then examine the impact of using credit on profits across households, where the

amount of credit is controlled by a set of instruments. Finally, we apply a fixed effects model with and without instruments to control for unobserved attributes that affect both the amount of credit and household profits. A final distinctive feature of this paper is that we compare the impact of microcredit with the impact of other formal credit.

The paper proceeds as follows. Section 2 derives the empirical equation, and discusses the data and the different impact evaluation techniques that will be used. Section 3 presents the empirical results. Finally, section 4 concludes the paper.

2. Model Derivation, Evaluation Methods, and Data

Model derivation

The empirical equation for self-employment profits we use is based on McKernan (2002). She derives a household profit function in the presence of imperfect markets. Assuming nonseparability between household production decisions and household consumption and labour supply considerations, self-employment profits are shown to be a function of output prices, variable inputs, the quantity of the fixed factors (land, capital assets, human capital) and a series of other exogenous variables in the household's utility function. The nonseparability induces determinants of household consumption and labour supply to become determinants of household profits. McKernan argues that credit may affect profits by providing additional capital assets. Credit helps poor credit-constrained households to initiate or to expand production, and hence enables either to perform self-employment activities, or to promote an existing self-employment activity.

Estimation methods

The aim of our analysis is to estimate the causal impact of microfinance on household self-employment profits. This requires that the impact of microfinance is disentangled from the impact of all observed and unobserved attributes that affect household self-employment profits. Moreover, it needs to be taken into account that the decision to participate in a microfinance programme is endogenous, and that the placement of microfinance programmes may be non-random. In order to measure the microfinance impact as good as possible, we apply a series of evaluation techniques that can be used to (partly) solve for these problems.

In our first estimate, we try to examine whether access to microcredit, independent of the actual borrowing, has a positive effect on profits. This estimate provides evidence on the effect of microfinance access, rather than actual participation. Estimating the average impact of access suffers less from selection bias than estimating the impact of participation. Therefore, estimating access to microfinance is more likely to yield unbiased coefficients than estimating the impact of participation.

We use a regression framework to estimate the average impact of microfinance access. More in particular, we estimate the following model:

$$\ln\left(\boldsymbol{Y}_{ij}\right) = \boldsymbol{X}_{ij}\boldsymbol{\alpha} + \boldsymbol{V}_{j}\boldsymbol{\beta} + \boldsymbol{E}_{ij}\boldsymbol{\gamma} + \left(\boldsymbol{T}_{ij}\boldsymbol{E}_{ij}\right)\boldsymbol{\delta} + \boldsymbol{Year}\boldsymbol{\vartheta} + \boldsymbol{\varepsilon}_{ij} \qquad (1)$$

Where Y is household self-employment profits of household *i* in commune *j* in a given year. In line with McKernan (2002), we define self-employment profits in terms of restricted profits, measured as total household gross revenues from self-employment, plus the value of household consumption from production less operating expenses exclusive of the price of the loan. X is a

vector of household characteristics. This vector includes a set of household variables that represent capital assets, human assets, and prices of outputs and variable inputs as previously specified by theory. Capital assets are proxied by household size, land and (farming) labour, which are seen as key factors influencing the agriculture production and thus household profit. Land is measured as the area of total land owned by the household, and the share of farming labour is defined as the ratio of the number of participants in farming activities over the total self-employed individuals of the household. Household human assets are captured by various demographics of the household head such as age, gender, marital status, ethnic group[i] and education. V is a vector of commune characteristics, which can be used as a proxy for prices of outputs and inputs. It includes e.g. access to market, access to public transport, and access to electricity (see Table A1 in the appendix for description of all variables used). E is a dummy variable that reflects whether a household is eligible to borrow and T is a dummy variable that reflects whether a household is in a treatment village. ($T_{ij}E_{ij}$) is a dummy variable that equals one if the household has access to microfinance in year t. Our coefficient of interest is δ. The OLS estimate of the coefficient δ gives the average impact of credit access - after controlling for being eligible, and having specific household and commune characteristics.

This method critically depends on the eligibility rule applied to borrowers and a good indicator for treatment communes. We consider a household to be eligible for microcredit if it is classified as poor by their commune authority. This information is available in our dataset. We assign a commune as a treatment commune if at least one household residing in that commune has participated in a microfinance programme. As will be explained below, we use two definitions of microfinance, and hence use two indicators for treatment villages.

The drawback of an estimate of the average impact of access to microfinance obviously is that it does not yield the impact of participation in the microcredit programme. Therefore, in the second

regression, we aim to explore the impact of participation in a microfinance programme on self-employment profits. By using pooled OLS, we estimate the following equation

$$\ln\left(\boldsymbol{Y}_{ij}\right) = \boldsymbol{X}_{ij}\boldsymbol{\alpha} + \boldsymbol{V}_{j}\boldsymbol{\beta} + \boldsymbol{E}_{ij}\boldsymbol{\gamma} + \boldsymbol{C}_{ij}\boldsymbol{\delta}' + \boldsymbol{Year}\boldsymbol{\vartheta} + \boldsymbol{\varepsilon}_{ij} \qquad (2)$$

where C_{ij} measures the amount of microfinance a household receives, according to the two definitions of microfinance we use (see below). This method disentangles the impact of microfinance from measurable attributes that affect the outcome variable. A drawback of this analysis, however, is that the panel characteristics are not taken into account. Moreover, this method does not control for unmeasurable attributes that affect the variable of interest. Therefore, in our third regression, we estimate a fixed effects model. A fixed-effects analysis has the important advantage that it implicitly controls for relevant unobserved household characteristics that do not change over time. The use of the fixed-effects model also allows *attrition* to be correlated with the unobserved fixed effect.

Our fixed effects model reads as follows:

$$\ln\left(\boldsymbol{Y}_{ijt}\right) = \boldsymbol{X}_{ijt}\boldsymbol{\alpha} + \boldsymbol{E}_{ijt}\boldsymbol{\gamma} + \boldsymbol{C}_{ijt}\boldsymbol{\delta}'' + \boldsymbol{Year}_{t}\boldsymbol{\vartheta} + \boldsymbol{\eta}_{ij} + \boldsymbol{\mu}_{j} + \boldsymbol{\varepsilon}_{ijt} \qquad (3)$$

Where η and μ are unobserved time-invariant attributes at the household and village level, respectively.

Although the fixed-effects model accounts for unobserved time-invariant attributes that affect self-employment profits and the amound of credit received by households, it does not entirely tackle the endogeneity of participation in the microfinance programme as the unmeasured

determinants of credit at both household and commune levels may vary over time (Khandker, 2005). Moreover, fixed effect estimations are confronted with the measurement error of credit, which is more likely to occur given a two-period panel data used, and thereby biasing the credit coefficients toward zero (Khandker, 2005). In order to address this problem, we finally use an instrumental variables method. The main issue with this method is the choice of a correct set of instruments, i.e. variables that are highly correlated with the size of microcredit, but are not correlated with the outcome variable. We follow the procedure by Pitt and Khandker (1998), and introduce a set of instruments that are defined as all household variables interacted with the indicator for credit access ($X_{ijt}T_{ijt}E_{ijt}$). According to Pitt and Khandker (1998), these instruments affect credit demand, while having no direct impact on the outcome variable. It should be noted that Pitt and Khandker (1998) use a Tobit regression in the first stage of the regression to explain credit demand. However, this requires a strict assumption of an identical impact of credit across borrowers in the second stage (Aghion and Morduch, 2005). For this reason, we follow the suggestion by Aghion and Morduch (2005), and use the 2SLS estimation technique. In the first stage, we estimate the stock of credit as specified by (4). In the second stage, we use the fitted credit amount drawn from (4) to estimate self-employment profits equation (3) with the household fixed-effects estimation.

$$\boldsymbol{C}_{ijt} = \boldsymbol{X}_{ijt}\boldsymbol{\varsigma} + \boldsymbol{E}_{ijt}\boldsymbol{\tau} + \left(\boldsymbol{X}_{ijt}\boldsymbol{T}_{ijt}\boldsymbol{E}_{ijt}\right)\boldsymbol{\upsilon} + \boldsymbol{Year}_{t}\boldsymbol{\rho} + \boldsymbol{\varepsilon}^{c}_{ijt} \qquad (4)$$

We note that our fixed-effects analyses do not allow the time-invariant variables to be included, thus many household demographics such as gender, age, marital status, education are dropped out from the fixed-effects estimation. Likewise, commune variables are excluded as they vary little over time. Finally, to capture the impact of the year-specific shock on self-employment profit, the year dummy is incorporated into all specifications.

Data

The paper relies on available data retrieved from the two Vietnam Households Living Standard Surveys (VHLSS, henceforth) in 2004 and 2006. At the household level, the surveys provide a wide range of information on household characteristics, including basic demography, employment, education, health, income, expenditure, employment, and production activities. At the commune level, information is available for demography, general economic conditions, and local infrastructure. The full sample of VHLSS 2004 covers 9,189 households with information on expenditure and income, of which 2,868 households borrowed from different sources of credit. Similarly, 2,962 households used credit among 9,189 households surveyed in 2006. We restrict our sample to rural households, and confine our credit data to formal credit only, i.e. credit given by microcredit institutions, by non-governmental credit organizations, and credit from formal financial institutions. Our final sample contains a balanced panel of somewhat less than 3000 households for 2 years. Rural Vietnamese households are involved in farming activities including crop cultivation, livestock, aquaculture and other agriculture-related activities, and/or a non-farm self-employment, notably, small production units or home enterprises. Using information available for all sample households regarding production outcomes, operating expenses and costs of the loan (when applicable), we derive a value of self-employment profits for all households in the sample.

As mentioned above, we use two proxies for microfinance. First, microcredit from the Vietnam bank for Social Policy (VBSP). Mainly subsidised by the government, this specialized bank's mission is to assist the poor in Vietnam with access to credit. The second type of microcredit is an arbitrary bundle of microcredit, which involves credit offered by the VBSP, credit given by the Bank for Agriculture and Rural Development (VBARD, henceforth) with a loan size under 20

million VND[ii] (approximately 1,000 Euro) per loan and credit given by other non-governmental programs.

In addition, we apply the same methodology as explained above for estimating the impact of other formal credit available for rural households in Vietnam. Other formal credit is proxied by non-microcredit loans from VBARD with a loan size above 20 million VND, and loans from formal and semi-formal credit sources, including commercial state-owned and private banks, and credit unions.

It should be noted, that in the regressions presented below, the microfinance data and the data on other formal credit refers to the total amount received by a household. These data do not distinguish between the uses of the different credit categories. However, in alternative regressions, not presented here, we have used data on (micro) credit used for production purposes only. These regressions yield qualitatively the same results.

<insert Table 1 about here>

Table 1 gives some detail on the credit participation by rural households in different credit programs. It appears that neither the VBSP program nor the other formal credit programs serve a substantial share of rural households. The table also shows that the amount of credit received per household has increased between the two years, and varies according to the credit program taken by the household. Credit from commercial banks appears to be substantially larger in size and to grow much faster as compared with microcredit. On average, credit volume per household increased by 28.6 percent for VBSP borrowers, by 19 percent for all microcredit borrowers as a whole while this growth rate is 66 percent for other formal credit. In spite of the rapid rise in the amount of credit received, only a small increase in self-employment profits of households is observed. Households who received credit from microfinance programs even experienced a small

decline in their profits. Measured in terms of production outcome, microcredit recipients considerably underperform relative to recipients from other sources for formal credit; and VBSP recipients appear to be the least successful in both years[iii]. This observation provides a first indication that the effectiveness of microcredit is low as compared to other formal credit.

4. Estimation results

Table 2 presents the estimation results with respect to microfinance provided by VBSP.

<insert Table 2 about here>

Equation (1) in the table suggests that having access to microcredit from the VBSP has no impact on household profits, since the coefficient on credit access is insignificant. So, households with access to credit from the VBSP tend not to perform better than those who do not have access, after controlling for being poor (eligible to microcredit), living in a village with certain characteristics and having specific household characteristics. Equation (2) suggests that participation in a microcredit programme positively affects household profits at the 10% significance level. However, as explained above, the OLS estimates may provide biased results. The fixed effects estimate, provided by Equation (3a), probably gives a cleaner estimate of the impact of microcredit. This regression indicates that microcredit does not significantly affect self-employment profits. Finally, equation (3b) presents the regression results for the fixed effects model with instruments. Again it appears that microcredit does not affect self-employment profits. Note that, despite the fact that the Sargan-Hansen J test statistic indicates that the instruments are valid, the endogeneity test suggests that credit is exogenous. This would make the instrumental variable technique redundant[iv]. The exogeneity of credit is also suggested by Khandker (2005) in his fixed-effect estimates with instruments.

<Insert Table 3 about here>

Table 3 reports the result for our second microcredit category. We use the same eligibility rule for the borrower and the same classification for treatment communes. The results are similar to the results for our first microcredit category (credit from VBSP): microcredit only has a positive significant effect in the pooled OLS estimate (equation (2)). In the fixed effects estimates, the result disappears. Note that with respect to the instrumental variable approach with fixed effects, the estimates now suggest that credit is endogenous.

<Insert table 4 about here>

Our next concern is the impact of other credit on household profits. Table 4 presents the regression results. We use a similar estimation procedure, except for one modification regarding the indicator of treatment communes. Given the fact that at least one formal credit provider of any types (commercial banks, other credit organizations) is present across all communes in the sample, the indicator for treatment commune is no longer required. The indicator for eligibility is now classified as non-poor households, and thereby reflecting household's access to credit.

Interestingly, access to other formal credit is found significant and positively affects household profits. It also appears that using other credit has a significant positive effect on profits. This result seems to be robust across alternative estimations methods, except for the fixed-effect model with instrumental variables. The endogeneity test, however, once again suggests that credit is exogenous, so that probably the outcome with the fixed-effects model without instruments is the most reliable.

Tables 2- 4 also report the effect of control variables on household profits. The year dummy is significant in most fixed-effects estimates, implying a *ceteris paribus* decline of household profits between the two years, as also marked in our descriptive analysis. The results indicate that poor households, denoted by being eligible for microcredit, perform worse than wealthier households. Noticeably, land and labour, either captured by household size or the share of farming labours, appear to be important drivers of household profits. Households who own more land, larger sized households and households with a lower share of farming labour tend to have higher profits. Female-headed households and households with a household head from an ethnic group are found to be less successful relative to their peers. Apparently, age and its squared term describe an expected inverted-U shaped relationship between household profits and age of the household head. At the commune level, communes with a better infrastructure, which is captured by access to road, seem to positively influence household profits.

5. Conclusions

This paper examines the impact of microcredit on household-self employment profits in Vietnam, and compares this with the impact of other (bank) formal credit. Using several estimation techniques, our empirical analysis suggests that credit from commercial banks has a positive effect on household self-employment profits. However, access to microcredit and participation in microcredit programs do not significantly affect household self-employment profits. This result seems contradictory with the conclusion by Nguyen (2008), who examines the impact of the VBSP program on per capita income and expenditure (not household profits) and only uses credit information for one year in his fixed-effect regression. He simply assumes credit to be zero in the year credit information was not available. Obviously, the use of an alternative indicator for household outcome can offer some explanation for the difference in findings. However, probably

the difference in results is mainly due to the fact that we use data on microfinance programs for two years, which allows us to come up with a better estimate of the impact of microfinance.

While the result seems striking in first instance, the explanation may be clear. Borrowers who have access to normal bank credit are non-poor, tend to possess more profitable investment opportunities, and thus are more likely to benefit from credit. On the contrary, microcredit recipients are engaged in informal activities that often have a low return and a low market demand and therefore may find it difficult to use credit effectively (Khandker, 2005). In addition, loan size and timing of credit may matter as microcredit loans are often limited in size and time of delivery, hindering the returns of borrowing to profits (Khawari, 2004). Concerning the loan size, it should be noted that average households wealth in Vietnam, even for the poor households, has increased substantially the last decade, and is relatively high as compared to countries like Bangladesh. The loan size of a typical microcredit loan in Vietnam may then be too small as compared to poor households' wealth in Vietnam to make a notable impact on profits (see Coleman, 1999 for a similar reasoning concerning microcredit in Thailand).

Our result, of course, should not be interpreted as if microcredit is useless. Microcredit programs very often are beneficial due to several reasons, other than the credit as such, such as the training programs that are provided, the possible positive effect on gender issues etc. These issues are not explicitly taken into account in our analysis. Therefore, based on our analysis, we cannot deny that microfinance may play an important role in improving the welfare of the poor. However, the results at the least suggest that microfinance is not a panacea for poverty reduction, and that one should not have overly optimistic expectations about the poverty reducing effects of microfinance in Vietnam.

Further research on the impact of microcredit on poverty reduction in Vietnam seems to be important. There are several issues that need more attention. First, it may be interesting to compare the impact of microcredit with that of informal finance. Second, some improvements on the methodology part seem important. In particular, if data availability allows this, the use and selection of better instruments to correct for endogeneity of credit seems to be relevant.

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Table 1. Household self-employment profits and credit participation

Participation in credit program	Number of participants (households)	Amount of credit per household (1,000 VND)	Self-employment profits before loan interests per household (1,000 VND)
2004	3254	-	16,836.94
All credit	1123	9,516.41	20,794.60
VBSP program	195	4,517.03	13,339.21
All microcredit programs	1021	7,262.49	17,999.43
Other formal credit	102	31,144.71	49,269.23
2006	3267	-	17,180.84
All credit	1145	13,972.02	20,941.86
VBSP program	313	5,808.70	13,707.30
All microcredit programs	1009	8,645.11	17,085.03
Other formal credit	136	51,849.26	50,543.04

Source: calculated by authors from VHLSSs 2004 and 2006.

Table 2. The impact of microcredit from the VBSP on household self-employment profits.

	Having access to credit program	Amount of credit received		
	OLS estimation pooled sample	OLS estimation pooled sample	Fixed-effect estimation	IV (2SLS) within fixed-effect estimation
	(1)	(2a)	(3a)	(3b)
eligibility[1]	-0.508756***	-0.513071***	-0.013369	-0.017607
	[0.035331]	[0.031168]	[0.036969]	[0.037768]
access to VBSP credit[2]	-0.006579			
	[0.055879]			
VBSP credit		0.000006*	-0.000001	0.000014
		[0.000003]	[0.000002]	[0.000022]
year 2006	-0.026204	-0.028013	-0.033683**	-0.038371**
	[0.022312]	[0.022282]	[0.013648]	[0.015055]
Household characteristics				
household size	0.161676***	0.161453***	0.110223***	0.109962***
	[0.007909]	[0.007893]	[0.013821]	[0.013558]
land	0.000013***	0.000013***	0.000004***	0.000004***
	[0.000002]	[0.000002]	[0.000001]	[0.000001]
share of farming labour	-0.823312***	-0.823388***	-0.832297***	-0.838443***
	[0.044318]	[0.044298]	[0.098260]	[0.097040]
Household head characteristics				
age	0.048024***	0.047994***		
	[0.006273]	[0.006272]		
the square of age	-0.000507***	-0.000507***		
	[0.000061]	[0.000061]		
female	-0.302797***	-0.302913***		
	[0.044782]	[0.044790]		
marital status	-0.026149	-0.026227		
	[0.049066]	[0.049069]		
literacy	0.057282	0.055387		
	[0.044084]	[0.044107]		
ethnic minority	-0.143936***	-0.145322***		
	[0.032528]	[0.032357]		
Commune characteristics				
access to road	0.271692***	0.272125***		
	[0.069613]	[0.069707]		
access to public transport	0.019869	0.019998		
	[0.022579]	[0.022579]		
access to electricity	-0.001072	-0.002043		
	[0.074869]	[0.074604]		
access to post office	-0.005841	-0.005674		
	[0.030629]	[0.030635]		
access to market	0.009117	0.009085		
	[0.024152]	[0.024151]		
Constant	7.960488***	7.963754***	9.487374***	
	[0.194574]	[0.194255]	[0.102133]	

	Having access to credit program	Amount of credit received		
		OLS estimation pooled sample	Fixed-effect estimation	IV (2SLS) within fixed-effect estimation
	(1)	(2a)	(3a)	(3b)
Observations	5905	5905	6101	5694
R-squared	0.296	0.296	0.093	0.089
Number of id			3185	2847
Sargan-Hansen J test –Pval[3]				0.9495
Endogeneity test –Pval[4]				0.2233

Notes:

OLS regression with White's correction for heteroschedasticity for pooled samples and robust standard errors adjusted for clustering effects on households in the fixed-effect estimation;
***, **, and * denote significance at 1%, 5% and 10%, respectively; Robust standard errors are in brackets.

1. *eligibility* defined as a household classified as poor by commune authority
2. *access to VBSP credit* defined as household being eligible for credit and commune with VBSP present
3. This statistic tests the null hypothesis that there is no correlation between the instruments selected and the error terms of the profit equation.
4. The "difference-in-Sargan" test the null hypothesis that the specified endogenous regressors can actually be treated as exogenous.

Table 3 The impact of microcredit on household self-employment profits

	Having access to credit program	Amount of credit received		
	OLS estimation pooled sample	OLS estimation pooled sample	Fixed-effect estimation	IV (2SLS) within fixed-effect estimation
	(1)	(2)	(3a)	(3b)
eligibility[1]	-0.509966***	-0.502006***	-0.01396	-0.009476
	[0.041481]	[0.031061]	[0.037042]	[0.037577]
access to microcredit[2]	-0.001176			
	[0.050824]			
microcredit		0.000017***	0.000002	-0.000031
		[0.000002]	[0.000002]	[0.000020]
year 2006	-0.026319	-0.033361	-0.034988**	-0.019798
	[0.022277]	[0.022176]	[0.013633]	[0.016854]
Household characteristics				
household size	0.161655***	0.157082***	0.109986***	0.113965***
	[0.007907]	[0.007788]	[0.013814]	[0.014470]
land	0.000013***	0.000013***	0.000004***	0.000005***
	[0.000002]	[0.000002]	[0.000001]	[0.000002]
share of farming labour	-0.823316***	-0.822794***	-0.830280***	-0.864809***
	[0.044322]	[0.043837]	[0.098307]	[0.102457]
Household head characteristics				
age	0.048023***	0.047221***		
	[0.006277]	[0.006250]		
the square of age	-0.000507***	-0.000499***		
	[0.000061]	[0.000061]		
female	-0.302845***	-0.301898***		
	[0.044781]	[0.044023]		
marital status	-0.026168	-0.024592		
	[0.049067]	[0.048232]		
literacy	0.057201	0.051753		
	[0.044028]	[0.043905]		
ethnic minority	-0.144071***	-0.127791***		
	[0.032524]	[0.032478]		
Commune characteristics				
access to road	0.271655***	0.250547***		
	[0.069626]	[0.068950]		
access to public transport	0.019864	0.01702		
	[0.022579]	[0.022446]		
access to electricity	-0.001123	-0.017722		
	[0.075707]	[0.071882]		
access to post office	-0.005816	-0.007981		
	[0.030644]	[0.031757]		
access to market	0.009055	0.008569		
	[0.024156]	[0.023964]		
Constant	7.960860***	8.004419***	9.481471***	
	[0.195472]	[0.192463]	[0.102416]	

	Having access to credit program	Amount of credit received		
		OLS estimation pooled sample	Fixed-effect estimation	IV (2SLS) within fixed-effect estimation
	(1)	(2)	(3a)	(3b)
Observations	5905	5905	6101	5694
R-squared	0.296	0.306	0.094	0.021
Number of id			3185	2847
Sargan-Hansen J test –Pval[3]				0.9731
Endogeneity test –Pval[4]				0.0603

Notes:

OLS regression with White's correction for heteroschedasticity for pooled samples and robust standard errors adjusted for clustering effects on households in the fixed-effect estimation;
***, **, and * denote significance at 1%, 5% and 10%, respectively; Robust standard errors are in brackets.

1. *eligibility* defined as a household classified as poor by commune authority
2. *access to microcredit* defined as household being eligible for credit and commune with at least one microcredit lender present.
3. This statistic tests the null hypothesis that there is no correlation between the instruments selected and the error terms of the profit equation.
4. The "difference-in-Sargan" test the null hypothesis that the specified endogenous regressors can actually be treated as exogenous.

Table 4. The impact of other types of credit on household self-employment profits

	Having access to credit program	Amount of credit received		
	OLS estimation pooled sample	OLS estimation pooled sample	Fixed-effect estimation	IV (2SLS) within fixed-effect estimation
	(1)	(2)	(3a)	(3b)
eligibility for other credit types[1]	0.511***	0.506***	0.01291	0.013073
	[0.0311]	[0.0309]	[0.036900]	[0.036929]
other types of credit		5.48e-06***	0.000003***	0.000006
		[1.99e-06]	[0.000000]	[0.000017]
year 2006	-0.0263	-0.0335	-0.038053***	-0.043088
	[0.0223]	[0.0221]	[0.013517]	[0.027534]
Household characteristics				
household size	0.162***	0.160***	0.108620***	0.106494***
	[0.00791]	[0.00783]	[0.013787]	[0.016824]
land	1.34e-05***	1.31e-05***	0.000004***	0.000004***
	[2.19e-06]	[2.15e-06]	[0.000001]	[0.000001]
share of farming labour	-0.823***	-0.820***	-0.831894***	-0.835433***
	[0.0443]	[0.0439]	[0.098034]	[0.097048]
Household head characteristics				
age	0.0480***	0.0481***		
	[0.00627]	[0.00626]		
the square of age	-0.000507***	-0.000507***		
	[6.09e-05]	[6.08e-05]		
female	-0.303***	-0.300***		
	[0.0448]	[0.0447]		
marital status	-0.0262	-0.0263		
	[0.0491]	[0.0489]		
literacy	0.0572	0.0561		
	[0.0441]	[0.0440]		
ethnic minority	-0.144***	-0.132***		
	[0.0325]	[0.0324]		
Commune characteristics				
access to road	0.272***	0.269***		
	[0.0696]	[0.0690]		
access to public transport	0.0199	0.0146		
	[0.0226]	[0.0224]		
access to electricity	-0.00124	-0.00259		
	[0.0749]	[0.0742]		
access to post office	-0.00582	-0.00628		
	[0.0306]	[0.0305]		
access to market	0.00904	0.0083		
	[0.0242]	[0.0239]		
Constant	7.450***	7.456***	9.478019***	
	[0.196]	[0.195]	[0.107616]	

	Having access to credit program	Amount of credit received		
		OLS estimation pooled sample	Fixed-effect estimation	IV (2SLS) within fixed-effect estimation
	(1)	(2)	(3a)	(3b)
Observations	5905	5905	6101	5694
R-squared	0.296	0.307	0.104	0.09
Number of id			3185	2847
Sargan-Hansen J test -Pval				0.7455
Endogeneity test -Pval				0.8567

Notes:

OLS regression with White's correction for heteroschedasticity for pooled samples and robust standard errors adjusted for clustering effects on households in the fixed-effect estimation;
***, **, and * denote significance at 1%, 5% and 10%, respectively; Robust standard errors are in brackets.

1. *eligibility* defined as a household classified as non-poor by commune authority. *Eligibility* also reflects access to non-microcredit.
2. This statistic tests the null hypothesis that there is no correlation between the instruments selected and the error terms of the profit equation.
3. The "difference-in-Sargan" test the null hypothesis that the specified endogenous regressors can actually be treated as exogenous.

APPENDIX

Table A1. Summary statistics of variables

Variable	Pooled sample Obs	Pooled sample Mean	2004 Obs	2004 Mean	2006 Obs	2006 Mean
household profits (before loan interests) (1,000 VND)	6521	17,009.230 [28,352.460]	3254	16,836.940 [29,430.590]	3267	17,180.840 [27,239.660]
eligibility (1 for eligible for microcredit and VBSP credit)	6521	0.1422	3254	0.1438	3267	0.1405
commune with VBSP presence	6521	0.1908	3254	0.1503	3267	0.2311
commune with microcredit lenders presence	6521	0.6021	3254	0.6017	3267	0.6024
access to VBSP credit (1 for access)	6521	0.0423	3254	0.0329	3267	0.0517
access to microcredit (1 for access)	6521	0.0903	3254	0.0879	3267	0.0927
VBSP credit (1,000 VND)	508	5,312.882 [7,430.848]	195	4,517.026 [4,306.549]	313	5,808.703 [8,806.470]
microcredit from all sources (1,000 VND)	2030	7,949.714 [8,072.386]	1021	7,262.494 [7,184.869]	1009	8,645.108 [8,829.945]
other types of credit (1,000 VND)	238	42,975.880 [90,570.380]	102	31,144.710 [22,515.490]	136	51,549.260 [11,7628.500]
Household characteristics						
household size (persons)	6451	4.3844 [1.7246]	3184	4.4359 [1.7270]	3267	4.3343 [1.7211]
land (areas in hectare)	6521	8,026.827 [17,596.310]	3254	7,688.650 [16,158.610]	3267	8363.658 [18,916.490]
share of farming labour (percentages)	6107	0.8046 [0.2964]	3036	0.8113 [0.2861]	3071	0.7980 [0.3061]
age household head (years)	6451	48.883 [13.807]	3184	48.357 [14.017]	3267	49.395 [13.581]
Household head characteristics						
female (1 for female)	6451	0.2023	3184	0.1985	3267	0.2060
marital status (1 for married)	6451	0.8231	3184	0.8235	3267	0.8228
literacy (1 for literate)	6350	0.8983	3124	0.8988	3226	0.8977
ethnic (1 for minority ethnic groups)*	6451	0.1897	3184	0.1888	3267	0.1907
Commune characteristics						
access to road (1 for access)	6370	1.0394	3128	1.0406	3242	1.0382
access to public transport (1 for access)	6370	0.4885	3128	0.4904	3242	0.4867
access to electricity (1 for access)	6370	0.9871	3128	0.9802	3242	0.9938
access to post office (1 for access)	6370	0.8562	3128	0.8389	3242	0.8729
access to market (1 for access)	6370	0.6184	3128	0.6045	3242	0.6317

Notes:

1. Means of the credit volume are calculated only from households that borrowed.
2. Standard deviation of continuous variables in brackets.

[i] Vietnam has over fifty distinct ethnic groups. The largest group (86 percent of the population) is Kinh (Viet), and other ethnic groups are considered as minority groups. Relative to the Kinh, the minority groups perform much poorer, both from an economic and social perspective.

[ii] At approximation: 1Euro = 20,000 VND

[iii] When measured in terms of net profits, i.e. profits after loan interests, net profits for 2006 turn out to be higher than net profits for 2004. It is likely that loan interests are substantially lower in 2006 as compared to 2004, thereby boosting the net profits for 2006. Profits used in our analysis are before loan interests deduction.

[iv] The Sargan-Hansen J statistic tests the null hypothesis that there is no correlation between the instruments selected and the error terms of the profit equation. We test for endogeneity of credit by using the "difference-in-Sargan" statistic. This statistic tests the null hypothesis that the specified endogenous regressors can actually be treated as exogenous.