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# THE IMPACT OF ACCESS TO CREDIT ON HOUSEHOLD WELFARE IN RURAL VIETNAM

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## ABSTRACT

*In this paper, we investigate the determinants of household borrowing from the formal financial sector, the determinants of credit rationing by the formal sector and the impact of credit on household welfare in rural Vietnam. We find that education, savings, the area devoted to farming and the availability of formal credit are important determinants of both household borrowing and credit rationing by the formal sector. We also find that credit has a positive (albeit small) effect on household welfare in rural Vietnam. Our findings have policy implications for land and banking sector reform.*

## 1. INTRODUCTION

A considerable amount of research has been devoted to understanding the functioning of credit markets, credit market imperfections and credit rationing (Amano, 1999; Bester, 1985, 1987; de Meza & Webb, 1987; Hellmann & Stiglitz, 2000; Stiglitz & Weiss, 1981; Swank, 1996). Credit

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1 rationing is broadly regarded as an excess demand for bank loans caused by  
the asymmetry of information on investment projects between banks and  
3 borrowers. Credit rationing occurs if some borrowers have limited access to  
credit. It thus affects the number of borrowers who receive credit. The other  
5 form of rationing occurs when some borrowers are rationed by the amount  
of credit, i.e., receive less than the amount of credit they demanded.

7 There has also been a focus on the analysis of rural credit markets (Meyer  
& Nagarajan, 1992, 2000), which are widely believed to be characterised by  
9 high lending transaction costs and lack of collateral when farmers do not  
own their own land, resulting in high interest rates being charged to bor-  
11 rowers. A combination of the above raises a very interesting research ques-  
tion: How do lenders in rural credit markets select borrowers and how much  
13 do they lend?

A number of recent papers have analysed such questions (Kochar, 1997;  
15 Pham & Izumita, 2002, Ranjula, 2002; Zeller, 1994). Their approaches and  
findings vary and differ, largely due to inadequate data. Zeller (1994) sees  
17 credit rationing as a function of access to the market conditional on the  
demand function of borrowers and finds that both formal and informal  
19 lenders<sup>1</sup> ration loan supply. They look at total household wealth and the  
leverage ratio of households. Pham and Izumita (2002) assume an excess  
21 demand for credit in the rural markets and thus see credit rationing as a  
function of access to the market or external credit rationing. They find that  
23 reputation, the dependence ratio and the amount of credit demanded are  
determinants of credit rationing. Their results imply that poorer households  
25 are more likely to be rationed.

Another question that one may also pose is, What determines the amount  
27 of credit that a household receives? Theoretically, the demand and supply of  
credit determine the amount of credit, and thus the demand and supply  
29 functions need to be separately identified (Pitt & Khandker, 1996; Yadav,  
Otsuka, & David, 1992). The problem of simultaneous functions leaves the  
31 construction of variables a critical issue for the consistent estimate of the  
household credit functions. Various approaches have been proposed to re-  
33 solve this issue. For example, based on household and province attributes,  
Pham and Izumita (2002) construct variables that proxy for both demand  
35 and supply. They find that farming area and the total value of livestock are  
decisive determinants of household borrowing from the formal sector. Oth-  
37 ers, such as Pitt and Khandker (1996), Khandker (2003) and Khandker and  
Faruqee (2003), consider household characteristics (such as age and edu-  
39 cation), village fixed effects (such as prices of selected products) and the  
competition characteristics (such as characteristics of competitor villages) as

1 the factors of household borrowing and find education and land owned are  
2 the core factors.

3 Another voluminous strand of literature on the rural credit market at-  
4 tempts to measure the impact of credit on household welfare.<sup>2</sup> Most of this  
5 research supports the idea that credit contributes positively to household  
6 welfare through improving household production or smoothing consump-  
7 tion over time. The literature also shows that most credit programs do not  
8 serve the poorest households, but when the poorest households are served  
9 they can definitely benefit through increased income and reduced vulner-  
10 ability to “shocks” (Morduch & Haley, 2002).

11 In the context of rural Vietnam, there has been relatively little work  
12 (Pham & Izumita, 2002) on the three issues above: determinants of house-  
13 hold credit access; determinants of household borrowing; and the impact of  
14 credit on household welfare.

15 This paper contributes to the literature by providing an empirical analysis  
16 of the rural credit market in Vietnam. The paper concentrates on formal  
17 credit,<sup>3</sup> as this plays a dominant role in Vietnam (Dao, 2002). The purpose  
18 of this paper is to analyse (i) the determinants of formal credit access in rural  
19 Vietnam; (ii) why and how formal lenders ration credit; and (iii) how access  
20 to credit contributes to household welfare. The rest of this paper is organ-  
21 ised as follows. In the next section, we briefly describe the credit market in  
22 rural Vietnam. Next, we present the econometric model and the hypotheses.  
23 Section 4 discusses the characteristics of the household survey data that has  
24 been used in this paper. The results of the estimation and testing are pre-  
25 sented in Section 5, along with an analysis of the results. The final section  
26 concludes with a summary of the findings and draws a policy conclusion.

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## 29 **2. THE RURAL CREDIT MARKET**

30 The rural credit market in Vietnam has been well described in recent pa-  
31 pers.<sup>4</sup> Briefly, the rural credit market in Vietnam is categorised into three  
32 core sectors: formal, semi-formal and informal. In the formal sector, key  
33 providers of microfinance services are the Vietnam Bank for Agriculture and  
34 Rural development (VBARD), the Vietnam Bank for the Poor (VBP – now  
35 known as Social Policy Bank), the People Credit Funds (PCFs) and the  
36 Rural Shareholding Banks (RSHBs). The semi-formal sector is dominated  
37 by National Programs, Microfinance Programs of Mass Organisations (such  
38 as the Women’s Union or Farmer’s Union), and Savings & Credit Schemes  
39 supported by NGOs and donors. These formal and semi-formal schemes

1 however, were either unable to meet the huge demand for financial services  
or they could not reach the poor. In such cases, the poor have to rely on the  
3 informal credit schemes, which consist mainly of credit extended by families,  
friends, traders, ROSCAs and private moneylenders.

5 Typically, formal and semi-formal financial sectors in Vietnam provide  
credit to rural households for the specific purposes of rural development  
7 and/or poverty reduction at cheaper interest rates. Thus, these sectors ba-  
sically employ their own criteria in selecting and screening borrowers who  
9 are eligible to receive loans from them. For this reason, we include the semi-  
formal sector in the formal sector in our study of credit exclusion.

11 There has been an increasing role of formal credit in the rural credit  
market. At the end of 1998, formal credit accounted for only 49%, but by  
13 the end of 2001, this figure was 70.2% of borrowing households in rural  
areas (Dao, 2002). In the formal sector, VBARD plays an important role. In  
15 1998, it accounted for 68% of borrowing households and 75% of the out-  
standing loans in the formal sector (Dao, 2002). The network of VBARD  
17 branches reaches to village level using the model of village banking and/or  
mobile banking. The monthly interest rate charged in the formal sector is,  
19 on average, relatively low, at 1.26%, compared with the 3.95% charged in  
the informal sector (McCarty, 2001). The average loan size from the formal  
21 sector is higher at VND 3.2 million, compared with VND 1.7 million in the  
formal sector (Dao, 2002; McCarty, 2001). However, VBARD usually  
23 grants approximately 50% of the actual loan amount requested by a low-  
income household, and the most decisive criterion for lending is the list of  
25 assets of the potential borrower. The most commonly accepted form of  
asset/collateral is the Land Use Certificate (LUC).<sup>5</sup> If a household has not  
27 been provided with the LUC, certification by local authorities that the land  
is free from disputes can be used as a loan guarantee (Dao, 2002).

29 The rural credit market is segmented. Following government policy, for-  
mal financial institutions offer loans only for the purpose of production  
31 (Dao, 2002). In 1998, loans for production capital accounted for about  
63.7% of all the loans taken from all sources (McCarty, 2001). Borrowers  
33 must present a business proposal when applying for a loan. Furthermore,  
although the government requires no collateral for loans of up to VND 10  
35 million (equivalent to USD 600), households in general are required to  
provide their LUCs as collateral in order to secure a loan (Dao, 2002).  
37 Business plans and LUCs are therefore important criteria for the screening  
of applicants (Mishkin, 2001, chap. 8, pp. 187–198) by formal lenders. The  
39 reasons for borrowing from the informal sector are various, of which  
smoothing consumption (Morduch & Haley, 2002; Rutherford, 1998) is

1 important. A survey in 2001 conducted by the Microfinance Resource Center at the National Economics University revealed that almost 99% of interviewed households took loans from the informal sector at higher interest rates as a result of restricted access to the formal sector (Dao, 2001).<sup>6</sup> Because rural households in Vietnam traditionally dislike being indebted to individuals, informal borrowing can be viewed either as distress borrowing or the second choice. Households may however borrow from relatives or friends at very low interest rates, but they are not normally in the form of contracts and are therefore temporary.

The government policy framework regarding the rural credit market is also a big concern (Dao, 2002). First, although the interest rate has been liberalised gradually, the low basic interest rates have discouraged formal institutions from extending to more rural households due to high transaction costs that create financial repression (McKinnon, 1973; Shaw, 1973). Second, the issuance of LUCs has been slow and has not yet been completed in many provinces. This reduces the probability of access of rural households to formal credit. Furthermore, an effective use of LUCs as collateral requires a market for transferring LUCs, which does not exist. Third, the policy of expanding lending to rural households and the use of the group lending method<sup>7</sup> with support from social organizations (such as the Farmer's Union or the Women's Union) has been causing a danger of delinquency. Households are formed and certified by social organisations in order to get loans, and they may get higher loans in the next cycle if they do not default, i.e., a rotational system of lending. As a result, many households borrow from the informal sector (short-term loans from money lenders, friends and relatives), repay the formal loans and then get higher formal loans to pay back their informal lenders. Thus, a feature of the rural credit market in Vietnam is the dominance of formal credit. This is different from many other developing countries mainly because of the widespread network of VBARD branches and the supporting policy of the government to extend credit to rural households. This, together with low interest rates, explains why formal credit is preferred by rural households in Vietnam and the fact that households borrow from the informal sector simply because they lack access to the formal sector.

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### **3. THE MODEL**

39 Consider three sets of agents in the rural credit market: households (potential borrowers), formal lenders (such as VBARD) and informal lenders

1 (such as money lenders, relatives, friends and ROSCAs). Of the households,  
 2 there are borrowing and non-borrowing households. Households may bor-  
 3 row from formal lenders, informal lenders or both in order to finance their  
 4 economic activities.<sup>8</sup> Households have a demand for credit and apply for  
 5 loans. The demand for credit depends on household attributes and the vil-  
 6 lage characteristics in which homeowners are living. Lenders then screen the  
 7 applications and decide to whom they will offer loans and how much to  
 8 offer (as the interest rate is fixed). As credit rationing is typical in credit  
 9 markets (Stiglitz & Weiss, 1981), especially under financial repression, some  
 10 applicants receive loans, others are rejected and yet others receive smaller  
 11 loans than they desire. There are thus three major questions that need to be  
 12 answered: (i) What are the determinants of the credit supply to households?  
 13 (ii) What are the determinants of credit rationing in the rural credit market?  
 14 (iii) How much does credit contribute to household welfare?

### 17 *3.1. The Determinants of Credit*

19 If we consider only households with loans as those that have a demand for  
 20 credit, it may lead to a sample selection bias because it is possible that  
 21 households without loans may have a demand for credit but be excluded.  
 22 However, we ignore the problem that some households receive less credit  
 23 than they demanded at the pre-set interest rate, i.e., they were also rationed  
 24 but not in the form of exclusion. In other words, to control for sample  
 25 selection bias, we adopt the financial exclusion form of credit rationing.  
 26 Furthermore, the amount of credit supplied to a household that a researcher  
 27 can observe is the result of the interaction between demand and supply. The  
 28 difficulty is that the factors that are likely to affect household demand for  
 29 credit are also likely to affect the supply of credit. For example, ownership  
 30 of farming land may positively affect household demand for credit, while it  
 31 may also positively affect the supply of credit if the lenders regard it to be  
 32 collateral in rural market (e.g., in the case of VBARD). This implies that  
 33 credit supply and demand curves cannot be easily identified. Thus, the de-  
 34 terminants of a credit model, rather than demand and supply separately, are  
 35 estimated as follows using Tobit regression:

$$37 \quad y = y_i^* = \begin{cases} f(x_i, z_i) & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases} \quad (1)$$

39 where  $y_i$  represents the amount of credit that one household receives from

1 source  $i$ , which equals  $f(x_i)$  if a household has loans and 0 otherwise  
( $i$  = source of credit such as formal, informal or total credit);  $x_i$  is a vector of  
3 explanatory variables that reflect household and local market characteris-  
tics; and  $z_i$  is a vector of *additional* explanatory variables proxied for the  
5 supply side of credit. Household characteristics include natural attributes  
(e.g., gender and age) and capital assets (e.g., length of education, land  
7 ownership and savings). Location characteristics represent distance-com-  
parative-effects and consist of socio-economic factors such as prices of se-  
9 lected common goods and services (e.g., rice, pork and sewing), the mean of  
local household characteristics (e.g., average of education years in com- **QA:1**  
11 mune).

The supply of credit depends on the terms of loan contracts, the avail-  
13 ability of credit and the competition for loans among borrowers. Given an  
excess demand for formal credit, as a result of financial repression, and the  
15 lack of liquid collateral, we propose that what could actually determine the  
supply of credit is the availability of credit. We consider the availability of  
17 credit at three levels: province, commune and village. Availability of credit  
from source  $i$  is proxied by the total credit from source  $i$ . How lenders  
19 allocate credit depends on the competition between households at the com-  
mune and village levels (Khandker & Faruqee, 2003). Competition is de-  
21 pendent on household and local characteristics, which are included in  $x_i$   
and the number of potential borrowers (proxied by the number of households in  
23 the commune). Moreover, as various sources of credit are substitutes and  
demand for one source of credit (such as informal credit) may depend on the  
25 supply of another source (such as formal credit), we also include the variable  
proxy for the supply of credit from a substitute source in  $z_i$ . Thus,  $z_i$  includes  
27 variables that proxy for the availability of credit, the number of competitors  
and the supply of credit from a substitute source.

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31

### 3.2. Determinants of Credit Rationing

33 Eq. (1) is used to explain factors that affect the amount of credit supplied to  
a household. It does not specify why some households receive loans while  
35 the others are excluded or receive less than the amount demanded. In other  
words, we may see credit rationing in the rural market, but how do lenders  
37 ration credit? Clearly, borrowing is a function of demand for credit and  
thereby access to the market. What a researcher can observe as the outcome  
39 of this process is the amount of credit supplied and the outcome of appli-  
cations. As the decision to offer loans is conditional on the decision to apply

1 for loans, it is necessary to separate these two stages: first households decide  
 3 whether to apply for loans and then lenders decide whether to offer or reject  
 5 the applications. We employ the Heckman approach ( see Heckman, QA :2  
 7 1974,1976, 1979, 1980), in which the probability of a household receiving a  
 9 loan depends first on it has a demand for credit and then on whether its  
 11 application is accepted by the lender (see similar framework, for example,  
 13 Zeller, 1994). The first-stage model takes the form below:

$$P(y_i) = f(x_i) \quad (2)$$

9 where  $y_i$  equals 1 if a household has demand for credit from source  $i$ , and 0  
 11 otherwise;  $x_i$  is a vector of explanatory variables that are similar to  $x_i$  in Eq.  
 13 (1), and then

$$P(y_i) = f(x_i, z_i, \xi_i) \quad (3)$$

15 where  $y_i$  equals 1 if a household receives loans from source  $i$ ;  $x_i$  and  $z_i$  are  
 17 vectors of explanatory variables.  $\xi_i$  is the Mill's ratio (see Greene, 2003;  
 19 Wooldridge, 2003 for details) computed from Eq. (2), which controls the  
 21 sample selection bias. Vector  $x_i$  in Eq. (3) represents the household and local  
 23 characteristics that the lender may use to screen applicants such as age,  
 25 education, savings and land use. Vector  $z_i$  again represents the supply side of  
 27 credit, which includes proxy variables for the availability of credit and  
 29 competition between communes (e.g., poverty incidence in the commune  
 31 and province and average education standards in the commune).

### 3.3. *The Impact of Credit on Household Welfare*

27 The purpose of this subsection is to estimate the effect of household credit  
 29 (borrowings) on household welfare. Since household welfare (e.g., expend-  
 31 iture) is positively affected by factors that also affect household credit, a  
 33 simple regression of a welfare equation conditional on household credit may  
 35 generate biased results. Pitt and Khandker (1996) outline three possible  
 37 sources of endogeneity of household credit. First, it is possible that credit is  
 39 not randomly allocated. Lenders (especially formal lenders) may allocate  
 credit based on local socio-economic conditions (e.g., poverty incidence).  
 Second, even if the allocation of credit is random, it is possible that un-  
 observable local attributes may well affect both household demand for  
 credit and household welfare. Third, unmeasured household attributes may  
 affect both household demand for credit and household welfare. For ex-  
 ample, households with more effort and dedication may demand more



1 credit and thus create higher quality welfare. Recent studies have proposed  
 2 different techniques but the same approach to this problem (e.g., Khandker  
 3 & Faruqee, 2003; Pham & Izumita, 2002; Pitt & Khandker, 1996). The  
 4 prevalent approach uses instrumental variables to control the endogeneity  
 5 of credit in the first stage and then corrects it for the household welfare  
 6 equation in the second stage. We adopt the econometric framework pro-  
 7 posed in Pitt and Khandker (1996) and Khandker and Faruqee (2003).  
 8 Consider the reduced form of the household welfare equation, as follows:

$$9 \quad y_i = f(C_i, x_i, u_i^Y) \quad (4)$$

11 where the subscript indicates household  $i$ ;  $y_i$  indicates the outcome of inter-  
 12 est (e.g., per capita expenditure);  $C$  is the amount of credit borrowed;  $x_i$  is  
 13 a vector of observable factors affecting household welfare; and  $u^Y$  is a vector  
 14 of unobservable factors of welfare. Vector  $x_i$  includes household and loca-  
 15 tion characteristics (e.g., age, gender, savings and prices of selected goods  
 16 and services). As  $u^Y$  is unobservable, it is possible that household credit may  
 17 serve as an indicator of these unobservable variables, and thus it causes  
 18 biased results in the estimation of Eq. (4).

19 To offer a solution for endogenous credit, we first estimate the determi-  
 20 nants of household credit, which include instrumental variables that will not  
 21 be included in Eq. (4) but can be used to predict the amount of household  
 22 credit that does not depend on household characteristics. Appropriate in-  
 23 strumental variables should not be correlated with household welfare but  
 24 must be closely correlated with the amount of credit borrowed. In Eq. (1),  
 25 there are two sets of variables, of which we can see the availability of credit  
 26 may well serve as instruments. It is safe to assume that the availability of  
 27 credit at the commune and village levels does affect the total household  
 28 borrowing but it does not affect the welfare at the household level. Thus the  
 29 first stage equation is similar to Eq. (1). However, we use the total house-  
 30 hold borrowings as a dependent variable, rather than borrowing from one  
 31 specific source. The reason for using the total credit is that if we use one  
 32 source of credit, it is possible that another source of credit, rather than the  
 33 controlled source, affects the household welfare. The predicted values are  
 34 then used instead of actual values in the second stage (i.e., Eq. (4)) to correct  
 35 for selection bias. The alternative option is to insert both the actual values  
 36 and the predicted residuals computed from first stage into the second stage  
 37 equation. The coefficient of the predicted residual in the second stage equa-  
 38 tion then indicates whether or not the endogeneity of credit is significant.

## 4. DATA AND MEASUREMENT

The data are drawn from the Vietnam Living Standards Survey – VLSS 1997/1998. The survey was conducted in 1997/1998 by the General Statistical Office. The survey was funded by the UNDP and the Swedish International Development Authority (SIDA). The survey is a part of the Living Standards Measurement Study (LSMS) household surveys conducted in a number of developing countries with technical assistance from the World Bank. The survey covers a sample of 5,999 households, 194 communes and 388 villages. The proportion of rural households is 71.2% (4,269 households), and there are 38.9% of rural households borrowing from all sources. However, after adjusting for data omission, we have selected a sample of 4,101 rural households, of which there are 2,108 borrowing households. Of the borrowing households, 1,246 households borrow from formal sources; 1,213 households borrow from informal sources, resulting in a number of 351 households having loans from both sources. The informal sources of credit include money lenders, relatives and friends, ROSCAs and other individuals. If we exclude all households with zero-interest rate loans from informal sources (most of them have loans from friends and relatives), the sample of borrowing households reduces to 1,645 households. Table 1 gives a brief description of the sample, and Table 2 provides a statistical description of the key variables. Further analysis of variables is undertaken in the following sections.

## 5. THE RESULTS

### *5.1. Determinants of Formal Credit*

We conducted two separate tests to estimate the determinants of household formal credit allocation. The first test (Test 1.1) is based on the whole sample of rural households with 4,101 observations, of which 1,246 households have formal loans. The second (Test 1.2), which looks at those who receive formal credit, uses the sample of borrowing households with 2,108 observations. The dependent variable is the log of household formal credit extended by time of interview.<sup>9</sup> The explanatory variables include household and location characteristics, the availability of credit and the variables that proxy for competition at the commune and village levels. We also use the proxy variable for the availability of informal credit at the village level for the reason that this source of credit may affect household demand for

**Table 1.** Summary of Borrowing Households.

	Households	Percentage	Average Loan Size (VND1,000)	Monthly Interest Rate
Borrowing households	2,108			
Formal source	1,246	100%	3,209	1.26%
Private banks and cooperatives		4.4%	2,230	1.59%
Government banks		82.2%	3,512	1.27%
Government programs and others		13.4%	1,547	0.87%
Informal source	1,213	100%	1,752	3.95%
Money lenders		19%	2,141	4.56%
Relatives		48%	1,861	2.63%
ROSCAs and other individuals		33%	1,366	3.69%
Non-borrowing households	1,993			
Total	4,101			

formal credit, as explained in Section 3. Table 3 presents the Tobit regression of the household borrowing equation (Eq. (1)).

At the 95% confidence level, we find that the age of the head of the household (AGE98) is positively and significantly related to the amount of formal credit supplied to households. The significance of the squared age indicates that middle-aged households receive the largest amount of formal credit. The amount of credit is therefore a nonlinear function of the age of the head of household. Education of households (EDUCYR98) is significant, implying that more educated households receive more formal credit. Farm households (FARM98) are seen to receive more credit, indicating that in rural Vietnam, farm households are the preferred clients. Formal credit extension is also dependent on the size of the household (HHSIZE), possibly implying that households with more members either demand more credit or formal lenders provide more credit to them because of their high earning capacity.

The total farming area of households (LGLAND980) is seen as an indicator of both collateral and the size of farm production and is positively

**Table 2.** Statistics of Key Variables.

Variables	Explanation of Variables	Non-Borrowing HHs		All HHs		Borrowing HHs		Formal Borrowing	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
AGE98	Age group of household head	4.543402	1.504427	4.284565	1.412567	4.039848	1.272664	4.084270	1.217065
AGE98*AGE98	Age squared	22.90467	14.51875	20.35235	13.19449	17.93928	11.29129	18.16132	10.80074
EDUCYR98	Education years of household head	6.150861	4.228838	6.492725	4.050438	6.815939	3.847384	6.857945	3.794083
FARM98	Dummy: Farm households = 1	0.753638	0.431000	0.588339	0.427840	0.763757	0.424874	0.795345	0.403611
GENDER98	Dummy: Male = 1	0.746613	0.435060	0.782004	0.412935	0.815465	0.388012	0.826645	0.378706
HHSIZE	Households size	4.511791	2.025933	4.849549	1.937950	5.168880	1.793819	5.344302	1.835241
LGLAND980	Log of farming area owned	6.435767	3.261838	6.683171	3.157325	6.917079	3.037519	7.064593	3.059102
LGFISA980	Log of financial savings (saving books, deposits etc)	5.083349	2.323899	4.820754	2.385538	4.572486	2.416824	4.718702	2.456173
LGNFSA980	Log of non-financial savings (savings in kinds)	3.981200	3.834011	3.432162	3.758125	2.913075	3.609820	3.192871	3.668047
LGDETE98	Log of price of detergent in commune (VND 1,000/kg)	1.939069	0.328720	1.940150	0.327640	1.941172	0.326690	1.938566	0.327976
LGFSOU98	Log of price of fish source in commune (VND 1,000/bo)	1.542432	0.395370	1.509139	0.407122	1.477662	0.415575	1.444695	0.432034
LGNOO98	Log of price of noodle in commune (VND1,000/pack)	0.105278	0.119876	0.109959	0.125294	0.114385	0.130083	0.115257	0.137191
LGPORK98	Log of price of pork in commune (VND1,000/kg)	2.998697	0.167860	3.003199	0.168737	3.007455	0.169491	3.026338	0.171293
LGRI98	Log of price of rice in commune (VND 1,000/kg)	1.235146	0.128080	1.234837	0.127256	1.234545	0.126501	1.233832	0.129430
LGSEW98	Log of price of sewing (VND 1,000/trouser)	2.675130	0.330479	2.694550	0.343081	2.712911	0.353682	2.759295	0.338541
EDUYR98C	Mean of education year in commune	6.442730	2.042569	6.493202	1.951857	6.540920	1.861263	6.412705	1.844661
LGLAN98C	Mean of log of farming area in commune	8.038560	0.583207	8.080288	0.598650	8.119739	0.610412	8.170626	0.608952
RCPIGS98	Price index by region	0.977015	0.045514	0.979988	0.046528	0.982798	0.047306	0.988350	0.045113
LGVIH980	Log of total informal credit in village	8.218244	2.804840	8.556792	2.597069	8.876870	2.340075	8.414376	2.840987
NOHHS98	Number of households in commune	667.3593	427.3440	654.3011	424.3382	641.9554	421.2058	596.4518	393.1924
LGPRFO980	Log of total formal credit at province level	14.605318	1.758388	14.80475	1.664795	14.99344	1.547901	15.22616	0.959694
LOGFCO980	Log of total formal credit at commune level	9.414417	2.432611	9.728391	2.208659	10.02524	1.927795	10.56044	0.906908
LGVIFO980	Log of total formal credit at village level	8.258445	2.986495	8.756093	2.640434	9.226593	2.162982	9.907602	0.983726
Observations	Number of households	1,993		4,101		2,108		9,076	1,246

**Table 3.** Results from Tobit Regression: Determinants of Formal Credit..

	Test 1.1		Test 1.2	
	Coefficient	z-Statistic	Coefficient	z-Statistic
AGE98	3.758498	4.829326*	2.196420	3.872094*
AGE98*AGE98	-0.456323	-5.265458*	-0.214564	-3.333159*
EDUCYR98	0.185905	3.453552*	0.148874	3.690984*
FARM98	0.730163	1.612231	0.714636	2.130596*
GENDER98	0.476951	1.058321	0.314248	0.930317
HHSIZE	0.616284	6.420827*	0.222580	3.107933*
LGLAND980	0.465386	7.175849*	0.241026	5.013996*
LGFISA980	-0.165587	-2.211143*	0.135384	2.503009*
LGNFSA980	-0.261559	-5.118806*	0.042807	1.115107
LGDETE98	0.508889	0.954907	0.382457	0.969152
LGFSOU98	-1.488011	-3.492921*	-0.351738	-1.137395
LGNOO98	2.226429	1.672403**	0.622205	0.636572
LGPORK98	-0.996639	-0.658557	0.754390	0.667149
LGRICE98	-3.169625	-2.175630*	-2.563133	-2.367508*
LGSEW98	1.991168	2.920890*	0.618908	1.263769
EDUYR98C	-0.192808	-1.480780	-0.166986	-1.731353**
LGLAN98C	-0.747076	-2.058645*	-0.706285	-2.671740*
RCPIGS98	-2.380690	-0.505146	-5.937609	-1.725125**
LGVIIN980	-0.111652	-1.697568**	-0.420104	-8.006437*
NOHHS98	-0.000263	-0.552376	-0.000449	-1.278521
LGPRFO980	-0.052588	-0.231004	-0.388116	-2.359462*
LOGCFO980	0.728956	1.867763*	0.571618	1.984287*
LGVIFO980	2.872957	9.253923*	1.964455	8.633500*
C	-37.16056	-5.882620*	-10.25352	-2.220564*
Log likelihood		-5598.107		-4424.520
Adjusted R-squared		0.196636		0.270345
Total observations		4,101		2,108
Positive observations		1,246		1,246

\*Significant at 5% level

\*\*Significant at 10% level.

and significantly related to the formal credit extended. This indicates that households owning more farm land demand more credit and formal lenders in fact offer more credit to those households.

Household financial and non-financial savings (LGFISA980 and LGNFSA980) are significantly related to formal credit, but with negative signs in the first test and positive signs in the second test. It is possible that

1 households with high savings demand less credit and thus they receive less.  
2 But it is also possible that (in the second test) when we use as control only  
3 those households who are clearly revealed to be demanding credit, the positive  
4 signs of financial savings indicate that households with more financial  
5 savings are seen to be more creditworthy by formal lenders and thus receive  
6 more credit.

7 We find that the availability of formal credit at the commune level  
8 (LOGCFO980) and at the village level (LGVIFO980) is positively and significantly  
9 related to the formal credit extended to households. However, at the province  
10 level (LGPRFO980), the availability of credit is found to be  
11 negatively and significantly related in the second test. This implies that the  
12 availability of formal credit is an important determinant of the amount of  
13 formal credit that one household may receive, but either there is an inequality  
14 in allocation of formal credit between communes or there are too  
15 many communes within a province. Specifically, some communes may receive  
16 less credit than the others in the same province, and thus households  
17 living in these communes may receive less credit compared with other  
18 households living in other provinces. The availability of informal credit at  
19 the village level (LGVIIN980) is negatively and significantly related to  
20 household formal credit at the 90% confidence level in the first test and at  
21 the 95% level in the second test, implying that where there is an excess  
22 demand for formal credit, i.e., the formal sector does not meet the demand  
23 of credit by households, there exists a market for informal credit.

24 Of the proxy variables for location (fixed) effects, we find that the mean of  
25 education in the commune (EDUYR98C), the mean of farming area in the  
26 commune (LGLAN98C) and the price index of the province (RCPIGS98)  
27 are negatively and significantly related to household formal credit, especially  
28 in the second test. A possible explanation of this result is that because  
29 households in “better” communes often demand more credit, the amount of  
30 formal credit that any one household receives is less (but the number of  
31 households receiving credit might be higher). This may imply the fact that  
32 there is rationing in the amount of credit as well as financial exclusion.

33 In short, we have found that total farming area, financial and non-financial  
34 savings and availability of formal credit are significant determinants of  
35 household formal credit. Households owning more farming land demand  
36 more credit, and formal lenders are more likely to offer larger amounts of  
37 credit since LUCs can be used as collateral in rural Vietnam. Households  
38 with higher savings may demand less credit. However, if they have more  
39 savings and do have a need for credit, they may receive more generous  
40 formal credit allocation. The availability of formal credit at the village and

1 commune levels is important to the amount of formal credit that one  
2 household receives. The results also show that there is an inequality in  
3 allocation of credit within a province or across communes within a province.

5

### 6 *5.2. Determinants of Credit Rationing by the Formal Sector*

7

8 In this section, we test two forms of credit rationing: credit exclusion and  
9 rationing of amounts of credit. In the first stage of testing, we use Eq. (2)  
10 and conduct tests on whether households demand formal credit. We use the  
11 sample of 4,101 households, of which 2,108 households request both formal  
12 and informal loans. Given that formal credit is a cheaper source and that it  
13 dominates the rural credit market in rural Vietnam as discussed above, we  
14 assume that if households request loans, they first seek formal loans and  
15 thus the dependent variable equals 1 for those who have either formal or  
16 informal loans. However, for a more reasonable assumption, households  
17 with zero-interest informal loans are excluded in the second test for the  
18 reason that non-zero interest borrowers are most likely to demand loans  
19 from the cheaper (rather than interest charging informal lenders) formal  
20 sector. There are 1,645 households with non-zero interest loans. Thus, the  
21 two alternative tests are presented in Table 4a, namely (2.1) and (2.2), re-  
22 spectively.

23 In the second stage, we use Eq. (3) and conduct the tests on how formal  
24 lenders decide to offer loans. The sample we use for these tests is those  
25 households who have loans, i.e., 2,108 and 1,645 households, respectively.  
26 There are two possibilities: (i) credit exclusion if a household does not re-  
27 ceive any formal loans and (ii) rationing in the amount of credit if a house-  
28 hold has both formal and informal loans.

29 For the test of credit exclusion, if households have formal loans (1,246  
30 households), the dependent variable takes a value of 1, and otherwise 0. The  
31 inverse Mill's ratios, which are computed from the first stage, are included  
32 as explanatory variables in the second stage. Table 4b represents the second  
33 stage tests, Test 3.1 and Test 3.2. The significance of the Mill's ratios and  
34 high percentages of correct prediction (71.96% and 78.12%) indicate that  
35 the two-stage regressions are more appropriate.

36 For the test of rationing in amounts of credit, two types of tests were  
37 conducted: (i) If households have informal loans (1,213 and 750 households  
38 for the first and second samples, respectively), the dependent variable takes  
39 the value of 1, otherwise 0. The purpose of these tests is to see why house-  
40 holds are being rationed either being excluded or rationed in amount of

1 **Table 4a.** Results from Probit Regression: Probability of Applying for  
 2 Formal Credit.

3 Variable	Test 2.1		Test 2.2	
5	Coefficient	z-Statistic	Coefficient	z-Statistic
7 AGE98	0.166910	1.847101**	0.404057	4.265932*
AGE98*AGE98	-0.031483	-3.183275*	-0.054266	-5.170551*
EDUCYR98	0.010287	1.553428	0.010036	1.491136
9 FARM98	-0.061831	-1.130932	0.067442	1.202834
GENDER98	0.035150	0.649202	0.020321	0.364873
11 HHSIZE	0.096402	8.065885*	0.091849	7.588738*
LGLAND980	0.024723	3.170051*	0.014459	1.818839**
LGFISA980	-0.049451	-5.241171*	-0.032069	-3.388112*
13 LGNFA980	-0.052710	-8.623011*	-0.048846	-7.782064*
LGDETE98	0.056098	0.882392	0.037159	0.573068
15 LGFSOU98	-0.279683	-5.383893*	-0.312052	-5.939800*
LGNOO98	0.467778	2.768203*	0.308479	1.820298**
17 LGPORK98	0.241978	1.389808	0.503740	2.853129**
LGRICE98	-0.392533	-2.223284*	-0.750968	-4.203524*
LGSEW98	0.462954	5.742108*	0.526625	6.459547*
19 EDUYR98C	0.050313	3.379183*	0.051269	3.390795*
LGLAN98C	0.113579	2.501985*	0.194549	4.240019*
21 RCPIGS98	-0.075613	-0.133571	1.203721	2.119201*
C	-2.701407	-3.646798*	-5.985611	-7.964278*
23 Log likelihood	-2609.430		-2526.231	
R-squared	0.081505		0.085321	
25 LR statistic	463.1079		471.2892	
Probability(LR stat)	0.000000		0.000000	
Total observations	4,101		4,101	
27 Dependent variable = 1	2,108		1,645	
Percentage correct prediction	63.35		64.81	

29 \*Significant at 5% level

\*\*Significant at 10% level.

31

33 credit. Table 5a presents the test results (Test 3.3 and Test 3.4 for samples 1  
 35 and 2, respectively), and the significance of the Mill's ratios indicates that  
 37 the two-stage regressions are appropriate. (ii) If households have both formal  
 39 and informal loans (351 households for both samples), the dependent  
 variable takes the value of 1, otherwise 0. The purpose of this test is to see  
 why households are being rationed in amount of credit. Table 5b shows the  
 results (Test 3.5 and Test 3.6). The Mill's ratios are not significant in this  
 test, and thus, the two-stage regression is not necessary.



1 **Table 4b.** Results from Probit Regression: Probability of Being Granted  
 Credit.

3 Variable	Test 3.1		Test 3.2		
	Coefficient	z-Statistic	Coefficient	z-Statistic	
5					
7	AGE98	0.407103	2.809102*	0.106084	3.322559*
	AGE98*AGE98	-0.032640	-1.914274**		
	EDUCYR98	0.030897	3.025259*	0.041918	3.416101*
9	FARM98	0.259537	3.145633*	0.144148	1.476160
	GENDER98	0.005030	0.060198	0.032832	0.339170
11	LGFISA980	0.046000	3.105118*	0.029831	1.808339**
	LGNFSA980	0.029256	2.663487*	0.050780	4.029634*
	EDUYR98C	-0.052447	-2.231807*	-0.045546	-1.641288
13	LGLAN98C	-0.234607	-3.469965*	-0.393176	-4.731628*
	PORU98	-0.000670	-0.267192	-0.000686	-0.233648
15	NOHHS98	-0.000263	-3.230685*	-0.000290	-3.033580*
	NOFPOR98	-0.000159	-1.073828	-0.000515	-2.950293*
	LGPRO980	0.055014	4.108307*	0.057827	3.756366*
17	LGPRFO980	-0.128837	-3.329671*	-0.180923	-3.506067*
	LOGCFO980	0.160149	2.407301*	0.007671	0.095329
19	LGVIFO980	0.371513	6.937432*	0.347980	5.416588*
	MILLS (1 and 2)	-0.822340	-3.867150*	-0.735897	-3.894671*
21	C	-1.958554	-2.049839*	3.075123	2.701524*
	Log likelihood	-1155.080		-792.9777	
23	R-squared	0.189976		0.129876	
	LR statistic	541.8052		236.7214	
25	Probability (LR stat)	0.000000		0.000000	
	Total observations	2,108		1,645	
	Dependent variable = 1	1,246		1,246	
27	Percentage correct prediction	71.96		78.12	

29 \*Significant at 5% level.

\*\*Significant at 10% level

### 31 5.3. Who Receives Formal Credit or Who Is Excluded?

33 As shown in Table 4b, of the household attributes, we find that the age of  
 35 the head of the household (AGE98) is positively and significantly related to  
 37 the probability of applying for formal loans and the probability of being  
 39 offered them. Education (EDUYR98) is not significantly related to the  
 probability of applying but is significantly related to the probability of being  
 offered credit, implying that formal lenders screen applications by using  
 education levels. More interestingly, household savings (LGFISA980,

**Table 5a.** Probability of Being Excluded from the Formal Sector.

Variable	Test 3.3		Test 3.4	
	Coefficient	z-Statistic	Coefficient	z-Statistic
AGE98	-0.172633	-1.217220	-0.047822	-1.654851***
AGE98*AGE98	0.010842	0.651303		
EDUCYR98	-0.025805	-2.627402*	-0.025915	-2.392328**
FARM98	-0.223021	-2.764176*	-0.132880	-1.493275
GENDER98	0.011265	0.138057	-0.018445	-0.209019
LGFISA980	-0.066026	-4.600638*	-0.059837	-4.065854*
LGNFSA980	-0.036795	-3.501435*	-0.051019	-4.566935
EDUYR98C	0.022214	1.010183	0.010843	0.447920
LGLAN98C	0.136742	2.134553**	0.199247	2.720781*
PORU98	0.003735	1.582073	0.004931	1.909509***
NOHHS98	0.000436	5.354588*	0.000493	5.462981*
NOFPOR98	0.000135	0.938981	0.000374	2.364500**
LGPRO980	-0.033255	-2.593995*	-0.024726	-1.781610***
LGPRFO980	0.211338	5.691731*	0.301982	6.379988*
LOGCFO980	-0.228339	-3.597153*	-0.149362	-2.041934**
LGVIFO980	-0.219530	-4.569855*	-0.137358	-2.508216**
MILLS (1 and 2)	0.653818	3.248622*	0.554439	3.278574*
C	0.700191	0.816742	-3.538992	-3.387448*
Log likelihood	-1251.282		-1034.956	
R-squared	0.129286		0.087202	
LR statistic	371.5890		197.7450	
Probability (LR stat)	0.000000		0.000000	
Total observations	2,108		1,645	
Dependent variable = 1	1,246		750	

\*Significant at 1% level.  
 \*\*Significant at 5% level.  
 \*\*\*Significant at 10% level.

LGNFSA980) reduce the probability of applying for credit but increase the probability of being offered it. This indicates that if households have savings, they are less likely to demand loans, but if they apply, they are more likely to be successful. In other words, banks are most willing to lend to those that least need to borrow. The productivity of farming land (LGPRO980), which is a proxy for the value of collateral, is also found to be positively and significantly related to the probability of being offered a loan.

As a proxy for competition among households within one location, the number of households in a commune (NOHHS98) reduces the probability

**Table 5b.** Probability of Being Rationed in Amount of Credit.

Variable	Test 3.5		Test 3.6	
	Coefficient	z-Statistic	Coefficient	z-Statistic
AGE98	0.381049	2.386669**	0.049810	1.589881
AGE98*AGE98	-0.037446	-2.080031**		
EDUCYR98	0.007475	0.666501	0.009271	0.789857
FARM98	0.004259	0.046046	-0.026075	-0.266399
GENDER98	0.025261	0.277560	0.005615	0.058386
LGFISA980	-0.043559	-2.987450*	-0.051701	-3.337208*
LGNFSA980	-0.020256	-1.882536***	-0.017048	-1.492603
EDUYR98C	-0.006331	-0.249587	-0.014025	-0.528158
LGLAN98C	-0.076753	-1.116748	-0.129386	-1.801081**
PORU98	0.004244	1.567901	0.004838	1.712917
NOHHS98	0.000264	2.940412*	0.000332	3.457073*
NOFPOR98	9.84E-05	0.584729	-8.28E-07	-0.004688
LGPRO980	0.034881	2.372414**	0.033052	2.161167**
LGPRFO980	0.136843	3.011024*	0.181051	3.590752*
LOGCFO980	-0.088627	-1.179738	-0.197566	-2.461886**
LGVIFO980	0.254907	3.913084*	0.241596	3.472660*
C	-5.175718	-5.462623*	-3.274568	-3.466064*
Log likelihood	-894.8133		-822.5585	
R-squared	0.057343		0.035411	
LR statistic	108.8660		60.39470	
Probability (LR stat)	7.77E-16		2.16E-07	
Total observations	2,108		1,645	
Dependent variable = 1	351		351	

\*Significant at 1% level.  
 \*\*Significant at 5% level.  
 \*\*\*Significant at 10% level.

of receiving formal loans. This may be because there are more applicants for loans from large communes and thus the probability of success for each applicant is less. Similarly, the number of poor households in a commune (NOFPOR98) is negatively significant in the second sample (Test 3.2). This implies either that more applicants reduce the probability of success or that formal lenders may be discouraged from offering loans where there are more poor households. The mean of productivity of the farming area in a commune (LGPRO98C) reduces the probability of being offered credit. The possible reason is that in communes with high productivity, there are more households applying for loans and thus the probability of success for each

1 household is low. This might imply a quota system of credit allocation by  
the formal lenders.

3 Availability of credit at the province, commune and village levels is found  
to be significantly related to the probability that one household is offered a  
5 loan. At the province level (LGPR980) it is found to be negatively signifi-  
cant, but at the commune level (LOGCFO980) and the village level  
7 (LGVIFO980) it is positively related. The different signs at different levels  
are not surprising as they imply inequalities in the distribution of formal  
9 credit between communes and villages within a province. However, the im-  
plication is that if formal credit is more available at the village and com-  
11 mune levels, an applicant household has a greater probability of receiving  
loans.

13 The results thus show that the age of the household head, education,  
savings, availability of credit and competition among households are the  
15 determinants of credit rationing in the rural credit market. Household sav-  
ings may increase the probability of being offered loans as savings are seen  
17 either as collateral or as an indicator of household wealth. The availability  
of credit at the village and commune levels also increases the probability of  
19 being offered it as the gap narrows between demand and supply. However,  
the number of households and the number of poor households in the com-  
21 mune are variables that reduce the probability of being offered loans from  
formal lenders.

23

#### 25 *5.4. Who Faces Credit Rationing?*

27 The above results have shown why some households receive loans from the  
formal sector while others do not. As an attribute of the Probit model, the  
29 results also indicate (with adverse signs of the coefficients) that households  
that do not receive any formal loans are those that are completely excluded  
31 from the formal sector. Looking further at those that are excluded from the  
formal sector, we conducted further tests to see why they are excluded and  
33 determine the difference, if any, between completely excluded and partly  
excluded households.

35 As shown in Table 5a, most of the key coefficients are with the adverse  
signs, compared with those resulting from the tests of households that have  
37 loans from the formal sector. This strengthens the above findings and once  
again indicates that the level of household education, the level of household  
39 savings and the availability of formal credit at the commune and village  
levels reduces the probability of being excluded.

1     However, when we look at those who are being rationed in amount of  
3     credit, i.e., those who receive loans from both formal and informal sectors,  
5     the results are interesting. As seen in Table 5b, clear evidence is not found of  
7     the effect of age and education levels of the household head on the prob-  
9     ability of being rationed in amount of credit. The number of households in a  
11    commune increases the probability of being rationed in amount of credit  
13    from the formal sector at the 1% level of significance in both samples,  
15    indicating that there may be a quota system of credit allocation.

17    The level of financial savings is found to be negatively and significantly  
19    related to the probability of being rationed in amount of credit at the 99%  
21    level of confidence, again indicating that household savings reduce the  
23    probability of being excluded and being rationed in the amount of credit.  
25    The level of non-financial savings is negatively and significantly related to  
27    the probability of being partly excluded at the 95% level of confidence and  
29    for the second sample only.

31    Surprisingly, at the 99% level of confidence, the availability of formal  
33    credit at the province and village levels is positively and significantly related  
35    to the probability of being rationed in the amount of credit from formal  
37    credit for both samples, while the availability of formal credit at the com-  
39    mune level is negative and significantly related to the probability of being  
41    partly excluded at 5% significance for the second sample. The positive effect  
43    of the availability of credit at the village level indicates that demanding  
45    households may have a high probability of getting formal loans in the vil-  
47    lage where formal credit is available, but the amount of the loan is insuffi-  
49    cient, and thus they have to borrow from the informal sector. This seems to  
51    prove the case of VBARD, which usually grants 50% of the loan amount  
53    requested and meets only 14% of the effective demand<sup>10</sup> for loans from the  
55    low income households in rural Vietnam (Dao, 2002).

57    The result thus suggests that the key reason why households are being  
59    rationed in the amount of credit is the quota system of credit allocation by  
61    formal lenders (mainly VBARD). It also indicates that savings are impor-  
63    tant factors influencing the amount of credit being granted in rural Vietnam.

### 65                    5.5. *The Impact of Credit on the Welfare of Households*

67    The first stage regression uses Eq. (1). We use the sample of 4,101 house-  
69    holds, of which 2,108 households have loans. The dependent variable is the  
71    log of total household borrowings, including formal and informal loans.

1 **Table 6a.** Results from Tobit Regression: Determinants of Household  
 Borrowings.

3	Variable	Coefficient	z-Statistic
5	AGE98	1.349238	2.743424*
	AGE98*AGE98	-0.222313	-4.091714*
7	EDUCYR98	0.074426	2.079463*
	FARM98	-0.218607	-0.737600
	GENDER98	0.308263	1.041345
9	HHSIZE	0.523353	8.092091*
	LGLAND980	0.231562	5.406392*
11	LGFISA980	-0.216638	-4.325020*
	LGNFSA980	-0.313294	-9.322477*
	LGDETE98	-0.110967	-0.319148
13	LGFSOU98	-1.196459	-4.213158*
	LGNOO98	2.887991	3.191280*
15	LGPORK98	0.798256	0.815365
	LGRICE98	-1.209699	-1.243912
17	LGSEW98	2.166007	4.950512*
	EDUYR98C	0.017579	0.209168
	LGLAN98C	-0.248341	-1.000495
19	RCPIGS98	5.121724	1.625574
	LGVIIN980	0.391335	8.247937*
21	NOHHS98	0.000433	1.435173
	LGPRFO980	0.292953	3.189332*
23	LOGCFO980	-0.231167	-2.201784*
	LGVIFO980	0.667861	7.758944*
	C	-22.05987	-5.381328*
25	Log likelihood	-8284.762	
	Adjusted R-squared	0.140771	
27	Total observations	4,101	
	Positive observations	2,108	

29 \*\*Significant at 10% level.

31 \*Significant at 5% level.

QA :8

33 Explanatory variables include all variables that have been used in Section  
 35 3.1. The test results are presented in Table 6a.

37 Basically, there are no differences in the effects of household and location  
 39 attributes on total borrowings, as compared with borrowing from formal  
 sources of credit (see Tables 6a and 3). However, for the variables reflecting  
 the availability of formal credit, there are some points to note: (i) availability  
 of formal credit at the province level is found to be positively and

1 significantly related to household borrowings, while it is found to be neg-  
2 atively and significantly related to formal credit and (ii) availability of formal  
3 credit at the commune level is found to be negatively and significantly  
4 related to household borrowings but positively and significantly related to  
5 formal credit. This possibly implies that where formal credit supply is re-  
6 stricted, households may borrow more from informal lenders.

7 In the second stage, Eq. (4) is employed. We use the sample of 4,109  
8 households with three dependent variables in logarithmic form as proxies  
9 for household welfare: per capita expenditure, per capita food expenditure  
10 and per capita non-food expenditure. The explanatory variables, among  
11 others, include the log of total household borrowings and the predicted  
12 residuals computed from the first stage. The results are presented in Ta-  
13 ble 6b. The significance of predicted residuals to dependent variables indi-  
14 cates that the two-stage regressions are more appropriate.

15 The results show that household borrowing is indeed statistically and  
16 significantly related to household welfare. At the 95% confidence level, a  
17 10% increase in total borrowings results in a 0.5% increase in per capita  
18 expenditure, 0.3% in per capita food expenditure and 1.1% in per capita  
19 non-food expenditure. This result confirms the hypothesis that access to  
20 credit increases household welfare and reconfirms findings from recent  
21 studies (Khandker, 2003; Khandker & Faruquee, 2003; Pitt & Khandker,  
22 1996). However, the effect is found to be small, and it may raise the issue of  
23 cost-effectiveness in providing financial services to rural areas.

25

27

## 6. CONCLUSION

29 In this paper, an analysis of the rural credit market in Vietnam and its  
30 impact on household welfare has been attempted. Unlike many other coun-  
31 tries, the formal sector has dominated the rural credit market in Vietnam,  
32 and so the results may potentially differ in the case of Vietnam. The market  
33 share of the formal sector has actually increased from 49% in 1998 to more  
34 than 70% in mid-2001. A study by Dao (2001) indicates that if households  
35 demand credit, they first apply for loans from the formal sector (e.g., gov-  
36 ernment banks), largely because interest rates are subsidised and thus lower  
37 than in the informal sector. However, for many reasons, households choose  
38 to borrow from the informal sector at much higher interest rates. They are  
39 either those who are completely excluded from the formal sector or those  
40 being rationed in the amount of credit. A number of households borrow

**Table 6b.** Results from Second Stage Least Squares: Impacts of Credit on Household Welfare..

Variable	Per-Capita Expenditure		Per-Capita Food Expenditure		Per-Capita Non-Food Expenditure	
	Coefficient	<i>t</i> -Statistic	Coefficient	<i>t</i> -Statistic	Coefficient	<i>t</i> -Statistic
AGE98	0.177633	7.306821*	0.141211	6.645651*	0.236982	6.203212*
AGE98* AGE98	-0.011968	-4.495937*	-0.010793	-4.638587*	-0.013962	-3.337507*
EDUCYR98	0.021521	11.73443*	0.011561	7.211788*	0.035329	12.25802*
FARM98	-0.023968	-1.597689	-0.024622	-1.877764**	-0.021334	-0.904948
GENDER98	0.001698	0.114598	0.042384	3.272195*	-0.057059	-2.450155*
HHSIZE	-0.102083	-27.05984*	-0.095099	-28.84122*	-0.115973	-19.56257*
LGLAND980	-0.011821	-5.475450*	-0.005308	-2.813256*	-0.019447	-5.732373*
LGFISA980	0.058729	22.25537*	0.041436	17.96455*	0.086300	20.81076*
LGNFSA980	0.045339	23.76919*	0.025533	15.31461*	0.077134	25.73254*
LGDETE98	0.005053	0.288457	0.025555	1.668933**	-0.032365	-1.175645
LGFSOU98	0.063933	4.294735*	0.048672	3.740697*	0.093392	3.992248*
LGNOO98	0.081608	1.738382**	0.101111	2.464200*	-0.042754	-0.579544
LGPORK98	0.406621	8.407764*	0.296651	7.017768*	0.520518	6.848926*
LGRICE98	0.210225	4.321962*	0.247643	5.824863*	0.204924	2.680927*
LGSEW98	0.070426	2.987775*	0.007520	0.365022	0.162953	4.399208*
EDUYR98C	0.011397	2.747349*	0.010979	3.027804*	0.020441	3.135507*
LGLAN98C	0.058936	4.704746*	0.065031	5.939285*	0.063567	3.229086*
RCPG98	-1.925638	-12.36355*	-1.486674	-10.92062*	-2.830734	-11.56548*
WTTOCREDIT	0.058897	10.76278*	0.031550	6.596244*	0.114528	13.29480*
RESIDTOBITI	-0.051599	-9.149071*	-0.029587	-6.002171*	-0.098780	-11.14564*
C	6.471063	31.34931*	6.224408	34.49953*	5.165934	15.92564*
<i>F</i> -statistic	184.2145		128.1238		162.6414	
Prob( <i>F</i> -statistic)	0.000000		0.000000		0.000000	
Adjusted <i>R</i> -squared	0.471941		0.382760		0.440870	
Total observations	4,101		4,101		4,101	

\*Significant at 5% level.

\*\*Significant at 10% level.



1 from their relatives and friends at zero-interest rates, but these households  
2 have been excluded from the analysis of credit rationing by formal lenders.

3 For those who receive loans from formal sources, the amount of credit  
4 that they may receive is affected by various factors, of which education,  
5 household savings, the availability of credit and the area devoted to farming  
6 are important. Apart from the availability of credit, education, household  
7 savings and farming area all represent the wealth of households. The results  
8 thus indicate that formal lenders tend to provide more credit to households  
9 that are better off. Similarly, we found that households with higher edu-  
10 cational standards, higher savings and higher productivity of land are more  
11 likely to receive loans. This again strengthens the hypothesis that formal  
12 credit is for wealthier rural households and that formal lenders are most  
13 willing to grant loans to those who are better off. Interestingly, we have  
14 found that for households who are being rationed in the amount of credit,  
15 the quota system in credit allocation is the key factor and this seems to  
16 prove the case of VBARD.

17 This analysis has also demonstrated that credit has a positive effect on  
18 household welfare as represented by per capita expenditure (food/non-  
19 food). Although the effect is small, it does contribute to the notion that  
20 access to credit may be an essential tool for poverty reduction in rural areas. QA :5  
21 It also raises the issue of the cost-effectiveness of this approach to poverty  
22 reduction. It may be that a policy better aimed at the poor is required.

23 Since the government of Vietnam is committed to providing credit to  
24 rural households as a key component of its strategy for rural development  
25 and poverty reduction (Dao, 2002), the policy implications drawn from the  
26 findings in this paper are as follows: First, given the effect of farming area  
27 and its productivity on household formal credit, land reforms should be  
28 accelerated. Many provinces have not yet finished the issuance of LUCs  
29 (Dao, 2002) and thus rural households may find it hard to gain access to  
30 formal credit as LUCs can be used as collateral. Second, the importance of  
31 the availability of credit at the village and commune levels indicates that the  
32 government should encourage the expansion of bank branch networks. Al-  
33 though interest rates in the banking sector are gradually being liberalised,  
34 the requirement to charge centrally determined interest rates plus a small  
35 margin (0.3% and 0.5% per month for short-term and medium-/long-term  
36 loans, respectively (Dao, 2002)), remains a constraint on banks' ability to  
37 cover lending costs and to develop lending at risk-premium based rates.  
38 Thus, a further liberalisation of interest rates could create more incentives  
39 for banks (VBARD, VBP) and induce more efficient lending. Third, better-  
off households seem to benefit more from formal credit. In order to ensure

1 that poorer households gain access to formal credit, the applicant-screening  
 2 process should not be based on criteria representing a household's wealth.  
 3 More emphasis should, for example, be placed on business plans, pre- and  
 4 post-loan training and group borrowing. Last but not least, using local  
 5 information obtained from NGOs and other social organisations could be a  
 6 good policy, but it may raise the danger of delinquency because the rotating  
 7 system of lending employed by these organisations may hide the nature of  
 8 repayment.  
 9

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 14 Kathleen (1999); Pitt & Khandker (1998); Quach (2002); Remenyi & Quin-  
 15 ones (2000).

## 17 NOTES

19  
 20 1. According to the CGAP, formal providers are sometimes defined as those that  
 21 are subject not only to general laws but also to specific banking regulation and  
 22 supervision (development banks, savings and postal banks, commercial banks, and  
 23 non-bank financial intermediaries). Formal providers may also be any registered  
 24 legal organisations offering any kind of financial services. Semi-formal providers are  
 25 registered entities subject to general and commercial laws but are not usually under  
 26 bank regulation and supervision (financial NGOs, credit unions and cooperatives).  
 27 Informal providers are non-registered groups such as rotating savings and credit  
 28 associations (ROSCAs) and self-help groups.

29 2. See for examples Khandker (1998), Panjaitan-Drioadisuryo (1999), Remenyi  
 30 (2000), Wright (2000), Khandker (2001), Coleman (2002), Pham and Izumita (2002),  
 31 Khandker and Faruquee (2003), Quach, Mullineux, and Murinde (2003), etc. QA :4

32 3. We include the semi-formal sector in formal sector, and thus the formal sector  
 33 includes banks, credit and savings institutions, microfinance programs by NGOs,  
 34 national programs, etc. The informal sector includes loans from relatives, friends,  
 35 revolving credit associations, etc.

36 4. See for examples McCarty (2001), Quach (2001), Dao (2002), Pham and QA :5  
 37 Izumita (2002), and Quach et al. (2003).

38 5. An LUC allows households to manage and use their farming land for farm  
 39 production and it can be transferred. It is not a certificate of possession.

40 6. M. H. Quach participated in this survey as a team leader, conducting household  
 41 interviews and processing data in 15 selected provinces across the country from May  
 42 to July 2001.

43 7. It is described as a small group of people, each of whom borrows money from a  
 44 bank. The bank does not require collateral because the borrowers are relatively poor

1 and do not own much property. Instead, the bank requires group members to be  
jointly liable for each other's loans – that is, if a member defaults on a loan, the rest  
3 of the group is liable for the remainder of the loan. If the group does not honour this  
joint obligation, then the entire group is cut off from future access to credit.

5 8. We imply both production and consumption. However, we assume that formal  
credit is mainly for the purpose of small business and farm production.

9 9. Including outstanding loans and loans already paid within 12 months.

7 10. Calculated as the ratio of (total low-income households receiving loans ×  
amount of loan granted) over (total low income households × amount of loan  
9 requested) (Dao, 2002).

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