Winners and Losers of the Economic Transition in Vietnam

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1. INTRODUCTION

Since the implementation of *Doi Moi*, the economic reform begun in 1986, Vietnam has been one of the fastest growing countries in the world. After the reunification of the North and South in 1975, Vietnam faced continuous food shortages and its economy performed quite poorly. In the early 1980s, the Vietnamese government chose to gradually reform its malfunctioning centrally planned economy. Gradual farm decollectivization, followed by price and market liberalization in the early 1990s, led to significant increases in agricultural yields. As agricultural productivity increased, Vietnam actually became a rice exporter during this period. The increase in farm production yielded significant benefit for the majority of the population in a country where nearly 80% of the people work in the agricultural sector. By the 1990s, reform was wildly successful; during the first half of the decade the average GDP growth rate exceeded 8%.

While economic indicators such as productivity and GDP growth emphasize Vietnam's remarkable macroeconomic performance, social indicators in Vietnam show that growth has not affected all of the population in the same manner. While some of the population has undoubtedly benefited significantly from transition, others have not. The World Bank has reported that as of 2002, 23% of the population still lacks access to clean water and 35% of children under five suffer from malnutrition. Thus, the household-level impact of economic transition has been unequal across different groups within the population (World Bank, 2003).

Economic decisions and their implications on household welfare depend on the conditions of both individual households and their surroundings. Households in

communes with paved roads or public transportation may have experienced faster improvements in living standards than the national-level economic growth because of better access to markets. Rural households with off-farm workers may also grow faster than solely agricultural households because wages are often higher off the farm than on the farm, as found in rural China early in its transition (Cook, 1999). In contrast, households without access to credit may experience smaller welfare improvements as their investment and consumption decisions are financially constrained.

In my thesis, I assess the household welfare improvement in Vietnam during the 1990s and identify household characteristics that help the level of welfare improvements during the economic transition. The data indicate that economic gain, measured by the annual growth rate of household per capita expenditures between 1992 and 1997, was greatest for the poorest quintile in 1992 and that 80% of the households experienced positive expenditure growth during this period. Nevertheless, over 30% of the households still lived below the poverty line calculated by the World Bank in 1997, indicating that some households have been less successful than others in improving their living standards. Identifying specific characteristics that affected household welfare will have important policy implications in pursuing further poverty reduction and elimination.

I have two objectives in this study. First, I will evaluate changes in household poverty and inequality status in Vietnam between surveys done in 1992 and 1997. Second, I will analyze some determinants of household consumption growth including credit access, and migration. If credit access has a significant impact on household welfare, further development of the financial sector and credit institutions could improve the household-level economic performance. If, on the other hand, credit access does not

affect growth but migration does, one might consider policies that would foster migration out of poorer areas to areas with available employment. Furthermore, if some regions are falling behind others, the government may need to coordinate policies with the regional authorities more closely.

In the next section, I will summarize the economic history of Vietnam over the last thirty years and recent studies on Vietnam's economic transition. In section three, I will describe the data used in this study, and in section four I will describe the changes in household poverty and inequality status. Section five provides welfare measures that categorize fast and slow growing households. In section six, I will explain the econometric models used in the rest of the thesis. The impact of credit access, migration, and other economic variables on household welfare improvements are discussed in section seven. The final section provides policy implications and a conclusion.

2. ECONOMIC REFORM IN VIETNAM IN THE 1980s AND 1990s

Reform in the 1980s:

Vietnam's transition from a centrally planned to a market economy began in the agricultural sector in the early 1980s. In 1981 the Vietnamese government implemented a contract system in which individual farmers entered contracts with cooperatives. Under this system, the government allowed farmers to keep excess production for their own consumption as long as they sold the required output at the government price. The collective farming system that existed prior to the 1980s forced all villagers to share their work and output. While this system promotes equitable wealth distribution, it also weakens individuals' incentives to produce. Under the collective farming system, any additional output produced due to an individual's increased effort would be shared among everyone in the village. By allowing individual households to consume their excess production, the contract system created incentives to increase productivity. However, the government maintained price control on agricultural products in order to maintain the affordability of staple foods during the initial stages of transition. As a result, agricultural prices were kept artificially low, and the economic distortion hurt agricultural producers, who made up 80% of the population. In addition, the land tenure security under Communist rule increased uncertainty and created disincentives for farmers to make investments that would enhance agricultural productivity. When farmers are concerned about possible government expropriation of their land, they are typically less likely to make investments (Besley, 1995). The continual poor economic performance in the early 1980s because of these inefficiencies and disincentives led the government to implement a larger-scale structural reform (*Doi Moi*) in 1986.

Vietnam's economic transition has proceeded differently in the North and the South due to recent history. Because the Communist government only took power in the South in 1975, commercial institutions were never fully suppressed there, nor were farmers ever fully collectivized. As a result, in the early 1980s agricultural output and productivity were both much higher in the South than the North. For example, many villages around the Mekong Delta had very weak collectives and depended heavily on individual decision-making, having operated under a system of individual household farming since before the reunification in 1975 (Fforde and de Vylder, 1996). Decollectivization of farming was officially implemented across the country only in 1988. This decision was made to counteract the poor harvest in 1987 due to the poor weather and crop failures (Fforde and de Vylder, 1996). The shift from collective to household farming in 1988 dramatically improved production efficiency across the country; however, even then the South continued to grow faster than the North. Farmers in the North simply lacked the initial knowledge of markets or even proper input levels required to make efficient production decisions. Familiarity with the household farming system was a crucial economic advantage for the South and caused the interregional gap to continually widen throughout the 1980s.

Another area of the early reform program was in the public sector. The Vietnamese government reduced production subsidies, increased the autonomy of state-owned enterprises (SOEs), and expanded credit access to the private sector in order to shrink the public sector and increase efficiency. The economic disturbance from these structural reforms was relatively small in Vietnam compared to other transition countries because of its large agricultural sector and its relatively active private sector, which grew

underground before 1986. These two sectors occupied 85% of the country's labor force and 60% of GDP (Dollar and Litveck, 1998). Since the proportion of the labor force working for the state was so low, when credit became accessible for private enterprises, the resource shift from the public to the private sector improved the efficiency of resource allocation without creating massive unemployment from the public sector. Thus, the reforms in the agricultural and public sectors finally started affecting the economy at the end of the 1980s, contributing to GDP growth rates of 6.8% in 1989 and 8.5% in 1990.

Late Doi Moi reform and economic growth in the 1990s

The collapse of the Soviet Union in 1989 pushed Vietnam towards further economic transition. Throughout the 1980s, the Soviet Union was a major source of financial support for the Vietnamese government. However, it forced Vietnam to invest in heavy industry and sell its products back to the Soviet Union. This inefficient allocation of resources became unnecessary when the Soviet Union collapsed. Furthermore, the collapse of foreign aid forced Vietnam to quickly adjust its macroeconomic policy (Dollar and Litveck, 1998). Along with the gradual development of financial institutions, the opening of the country to foreign investment and the liberalization of prices and markets turned Vietnam into one of the fastest growing countries in the world during the 1990s.

As the Vietnamese markets became increasingly open during the early 1990s, agricultural growth accelerated; Vietnam developed into the second largest rice exporter in the world. This fact is particularly remarkable, as Vietnam was a net importer of food throughout the 1980s and many regions suffered from food shortages. The output growth

of rice and other agricultural products can be attributed to the liberalization of fertilizer markets, which reduced input costs; the liberalization of output markets, which increased prices and exports; and the expansion of the individual household farming system. While output increased across the country, the disparity between the North and the South continued to increase in the 1990s (Benjamin and Brandt, 2001). Although the price of fertilizer fell in both the North and the South, the producer price of rice increased more in the South, encouraging higher production there. Because rice farmers in the South were more efficient than the rice farmers in the North, production in the North shifted from rice to other agricultural products. The diversification of agricultural production became possible because internal trade barriers between the North and the South were completely removed by the early 1990s. Rice could flow from the South to the North, which had not occurred before. As a result, growing agricultural output benefited farmers in both regions (Benjamin and Brandt, 2001).

A further economic reform that improved the performance of the agricultural sector in the 1990s was the enactment of the new Land Law in 1993. Under this law, the land tenure—the land-use right—was extended to twenty years or more, and the government allowed transfers of land-use rights. Although land ownership remained in the hands of the government, the longer lease period provided farmers land security and encouraged them to invest in their land productivity. In theory, the establishment of land-use rights would enable transfers from inefficient to efficient users and encourage inefficient farmers to work off-farm. However, this adjustment was relatively slow in Vietnam; Ravallion and Van der Walle (2003) estimate that only one third of the initial inefficiency has been eliminated through land-use right transfers between 1992 and 1997.

They also find that farmers who had inefficiently low land endowments in 1992 have reduced inefficiency—meaning that they increased their land holdings—at a faster rate than those who had inefficiently high land endowments. In other words, the new law has benefited poor, small land holders more than the richer, large land holders.

Deininger and Jin (2003), however, suggest that the greater access to land for initial small landowners is the result of the rich people selling their land, working off-farm, and increasing their earnings; therefore, even though the new pattern of land distribution might be more efficient, it does not necessarily imply enhanced equity. They recognize two types of land suppliers: those who find off-farm employment—generally wealthier households—and those who experienced an economic shock and were forced to sell their land-use rights. In the latter group of suppliers, the sale of land-use rights is motivated by a desperate need for cash to smooth consumption, which cannot be accomplished through credit markets or transfers. Although Deininger and Jin do not provide clear conclusions on the impact of land distribution on equity, the establishment of the long-term land security played an important role in the welfare improvement in rural households by providing them with valuable assets and collateral.

Economic Growth and Improvement in Health and Education

Several previous studies suggested that health and education can be linked with economic growth. For example, Fujita and Ear (2002) suggest that the mother's education has a positive, statistically significant effect on household expenditures. Besides the obvious impact of schooling on household welfare, in other parts of the world parental education has been found important in explaining variables related to children's

health. A study done in Central Java finds that parental schooling has a positive effect on children's nutrition (Block and Webb, 2003). Skoufias (1999) also found that mother's education is particularly significant in improving children's nutrition status in Indonesia. Strauss and Thomas (1998) summarize recent studies that provide evidence showing that the investment in health yields higher returns for those in low-health status by improving productivity.

Vietnam is no exception; it has demonstrated improvement in education, health status, and nutrition that have coincided with increases in household welfare. These improvements are somewhat surprising, given that many countries going through economic transition have experienced contraction of public social service provision, since government budgets often shrink as part of transition. Before *Doi Moi* was implemented, health and education services were fully financed by the government through cooperative funds and household contributions. After 1986, the government started encouraging the establishment of private institutions, allowing public schools to charge tuition and legalizing the private provision of health care and the charging of user fees in the health sector (Glewwe and Litvack, 2002). Privatization of the education and health sectors is not harmful if the private sector provides services more efficiently and the quality of the services improves or at least stays constant.

In Vietnam, the privatization of these services was also supported by the restructuring of public budget allocations. For example, government spending on education shifted from higher education to primary education: the publicly financed share of primary education rose from 45 to 61% between 1992 and 1997 while that share for post-secondary education decreased from 71 to 46%. As a result, per student public

spending on primary education tripled between 1992 and 1997 (Nguyen, 2002). However, inequality of educational opportunities remained a problem in 1997. Nguyen notes that the enrollment rate in primary schools increased dramatically for the bottom household expenditure quintile, yet the composition of the household expenditure in education indicate that the *quality* of education differs greatly between the richest and the poorest quintiles. While a large portion of education expenditures among poor households consists of parental contributions to commune schools, the spending of richer households is on quality-enhancing items, including private tutoring and transportation. These findings suggest that the inequality of education is not due to the inequality of access to schools but due to the community environment that surrounds the low-expenditure households.

Similarly, the improvements in health status differed by household income level between 1992 and 1997. While self-treatment became more accessible to the poor households, Trivedi (2002) identifies income, insurance status, and age as the three most important determinants of the utilization of public hospitals. The utilization of health care appears to depend heavily on household income level because insurance status itself is correlated with household income, although the author notes that the household income level is probably endogenously determined with the utilization of health care. There is also evidence that commune variables, such as the distance to private pharmacies and the quality of commune health services, predict child malnutrition (Glewwe et al., 2002). Thus, if these authors are correct, improvement in health status and in access to health care is determined both by household income and commune characteristics.

Household welfare improvement during the 1990s is analyzed in detail by Glewwe et al. (2000). According to their study, the economic winners of the transition in the 1990s are households in urban areas, the Red River Delta, and the South East, as well as those in the white-collar occupations and with household heads with formal education. In addition to these individual household characteristics, the study also provides evidence for the significant impact of commune characteristics, particularly the positive impact of paved roads, on the household expenditure levels. The main focus of the paper by Glewwe et al. is on household agricultural variables, including land productivity and variables related to land areas. They find that the change in irrigated land area and diversifying of economic activity (moving out of agriculture) both have a positive and significant impact on household expenditures.

The motivation of my study is to extend this analysis to address the impact of other household characteristics on household welfare. I am interested in household behaviors that might alleviate economic constraints, potentially leading to the diversification of income-generating activities. In particular, I will study the impact of access to credit and seasonal migration, as few studies have analyzed these two household decisions that may significantly affect household's well-being.

3. DATA

The data for this study was obtained from the Vietnam Living Standards Survey (VLSS), conducted in 1992-93 and in 1997-98 by the World Bank in collaboration with the Vietnam State Planning Committee and the General Statistical Office. The VLSS is a comprehensive nationwide survey consisting of two main parts: a household survey and a commune-level survey. The household survey collected information on various aspects of living conditions, including individual-level health, education, off-farm employment, on-farm labor, and migration. The survey also collected detailed information on demographics, housing condition, family expenditures, income sources, and credit access. For this study, the detailed information on expenditures is particularly useful as I follow Deaton's (1997) advice and use household expenditures to measure relative welfare. Total household expenditures are calculated by summing up the consumption expenditures on food, home-produced food, nondurable and nonfood goods, the estimated rental value of durable goods, the estimated rental value of the dwelling, and the value of in-kind transfers from employers. The commune survey provides information on various facilities and activities in the commune, such as health facilities, schools, agricultural practices, and market access. The commune-level information can be helpful in constructing supply-side instruments for household characteristics because some of them are exogenous to the individual household expenditures.

The two surveys in 1992 and 1997 have significantly different sample sizes and geographic compositions. The sample of 4799 households in the 1992 survey is nationally representative. The 6000 households in the 1997 survey include over fifteen hundred households that were added from the 1995 Multi-Purpose Household Survey to

Table 3.1 Comparison of Households by Sample using the number of households and expenditures per capita, Vietnam

Statistic	Panel Households	Households Dropped in 1997 Survey
All Households		
Number of Households	4304	495
Median Exp. Per Capita	1616.8	1783.3
Mean Exp. Per Capita	2002.0	2395.0
Rural Households		
Number of Households	3495	344
Median Exp. Per Capita	1506.5	1510.4
Mean Exp. Per Capita	1732.0	1854.0
Urban Households		
Number of Households	809	151
Median Exp. Per Capita	2589.6	2720.4
Mean Exp. Per Capita	3168.4	3627.4
Top Quintile		
Median Exp. Per Capita	4139.6	4694.5
Bottom Quintile		
Median Exp. Per Capita	875.9	911.0

Notes: Expenditures are expressed in thousands of 1998 Vietnamese dong. US$1 is approximately 13,900 dong in 1998.

replace the households that were not tracked from the 1992 survey. As a result, the 1997 sample is biased toward urban areas, the Central Highlands and the South East. For this study, I construct a panel of 4304 households that were included in both the 1992 and 1997 surveys, because I am interested in the changes of individual household's well-being between the two surveys. Thus, my sample excludes the 495 households in the 1992 survey that were not followed up in 1997, and it excludes the 1697 households that were added to the 1997 survey. Because the sample in the 1992 survey is nationally representative, dropping the 495 households may influence my findings if their household characteristics significantly differ from the characteristics of the 4304 households in my sample. I am particularly concerned with the possibility that the expenditure levels of

495 households are systematically different from those of the 4304 households tracked and that my analysis may be affected.

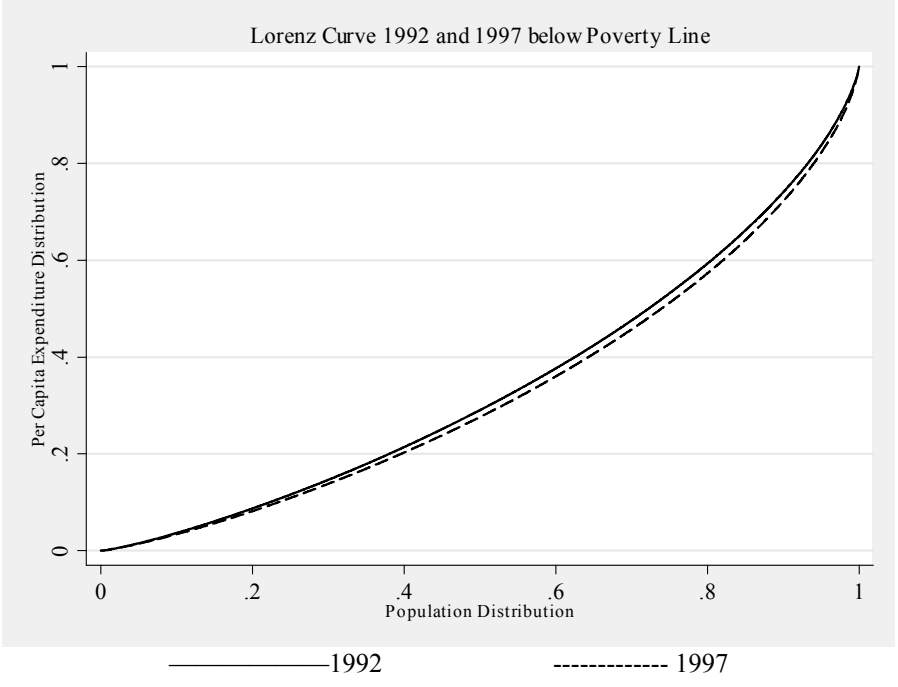
Table 3.1[1] presents statistics comparing the 4304 households in the panel (column 1) and the 495 households that were not tracked in 1997 (column 2). Mean and median household per capita expenditures are both greater in the households which were not re-interviewed in 1997. This pattern is consistent for rural and urban households as well as for the households in the top and the bottom quintiles. The table also shows that a far larger percentage of urban households (15.7%) were not re-interviewed than rural households (9.0%). Two sample-mean-comparison tests suggest that the differences in mean expenditures between the panel households and households dropped are statistically significant (p-value of 0.0001). As a result, one might be concerned that I miss some interesting dynamically growing households in the analysis. However, the significance of the differences between panel households and households dropped becomes much smaller when I test urban and rural areas separately (p-values are 0.085 and 0.097 respectively). Since I will study urban and rural areas separately, the statistical significance on the differences in expenditure levels at the national level little affects my analysis. Furthermore, when comparing median expenditure levels, the differences between the two groups are minimal among households in rural areas and in the bottom quintile. The median may be more reflective of the welfare of typical household because it is not influenced by outliers that are several standard deviations above the mean. Thus, I deduce that the differences in expenditure levels among relatively poor rural households, on which the critical part of my analysis in this paper focuses, will not be significantly affected by the dropped households.

[1] All tables and figures in this paper are constructed from VLSS 92/93 and 97/98 data.

4. INEQUALITY AND POVERTY

Vietnam, which was among the poorest countries in the world in the 1980s, became one of the fastest growing countries in the world in the 1990s. Despite this rapid economic growth, some households gained more during this period than others. In this section, I describe the changes in poverty and inequality in Vietnam between 1992 and 1997. Evaluating changes in inequality provides a picture of how this unequal distribution of economic growth affected social welfare and poverty. The Lorenz curve, which plots wealth distribution against population distribution, is one of the most common ways to illustrate the inequality of wealth distribution. The two Lorenz curves in Figure 4.1 show the changes in the distribution of household per capita expenditures in Vietnam: the 1992 curve is unbroken line and the 1997 curve is dotted. The slight expansion of the curve indicates a small increase in inequality between the two years.

Figure 4.1 Lorenz Curves for Household Expenditure per capita in 1992 and 1997



However, the expansion of concavity is small and concentrated in the middle to high income groups, suggesting that the inequality between the richest and the poorest did not significantly increase.

In order to further measure changes in inequality, I use two inequality measures; the Gini coefficient and the Theil index. Both indices satisfy the three conditions of appropriate inequality measures originally developed by Amartya Sen (Anand, 1997). First, changes in population sizes of the same proportion for all expenditure levels will not affect the index; second, changes in expenditures of the same proportion for all households will not affect the index; and finally, any transfer from richer to poorer households that does not reverse the expenditure ranking will reduce the index. The Gini index measures the deviation of Lorenz curve from the diagonal (equality line): the ratio of the area between the diagonal and the Lorenz curve to the area of the triangle under the equality line. As the curve expands out, implying an increase in the inequality of wealth distribution, the Gini ratio also increases. The second measure, the Theil index, is measured by the divergence of expenditures of each household from the national average expenditure and is defined by:

$$T = \frac{1}{N}\sum_{i=1}^{N}\frac{Y_i}{\sum Y}\ln\left(\frac{Y_i N}{\sum Y}\right), \qquad (4.1)$$

where N is the total number of households, Y_i is per capita expenditure of household i, and ΣY is the sum of expenditures of all households. The term $\sum_{i=1}^{N}\frac{Y_i}{\sum Y}$ reflects the weight of household expenditures, and $\frac{Y_i N}{\sum Y}$ reflects the ratio of household expenditure to the

Table 4.1 Inequality Statistics

	1992 National	Rural	Urban	1997 National	Rural	Urban
Household per capita expenditures						
Median	1616.8	1506.4	2589.6	2212.3	2015.2	3941.9
Mean	2002.2	1732.2	3169.9	2835.5	2359.7	4893.0
Inequality						
Gini	31.5	26.9	33.1	33.9	28.0	34.4
Theil	18.0	12.7	18.5	21.3	14.0	20.1

Note: Per capita expenditures are in thousands of 1998 Vietnamese dong.

average expenditure[2]. One of the advantages of using the Theil index is that the decomposition of inequality by population groups can be easily done by changing N and using average incomes within groups; for example, an urban-rural inequality measure can be easily calculated.

Table 4.1 summarizes inequality status in Vietnam in 1992 and 1997. In the transition from a planned to a market economy, the unequal distribution of benefits tends to favor the initially wealthy because of their various economic advantages, including better access to information and greater resources for investment. For example, the Gini coefficient increased from 21.2 to 25.9 in the Czech Republic and 23.9 to 30 in Poland between 1991 and 1997 (Transitional Report 2000), and 25.7 to 32.7 in Kazakhstan between 1988 and 1995 (Institute for Volkswirtschaftslehre). When compared with inequality increases in these transition countries, the change in Vietnam at the national level are strikingly small. Over the five-year period, the Gini coefficient increased from 31.5 to 33.9 at the national level, 26.9 to 28.0 in rural and 33.1 to 34.4 in urban areas. Both Gini and Theil indices confirm that the increases in inequality are similarly small in rural and urban areas, although the level of inequality is consistently greater in urban

[2] Notice that $\frac{N}{\sum Y}$ is simply the inverse of average per capita expenditures.

Table 4.2 Poverty Statistics

	1992 national	rural	urban	1997 national	rural	urban
Poverty						
head count						
poverty	50.5	57.1	21.9	33.5	39.3	8.5
food poverty	16.8	19.4	5.6	12.4	14.9	1.2
poverty gap	28.7	28.6	23.4	17.7	10.0	7.3

Poverty : if hh per capita expenditure < adjusted per capita expenditures of hh consuming 2100 calories
Food poverty: if hh per capita expenditure < hh per capita expenditure necessary to afford a food basket of 2100 calories

areas. Thus, households in urban areas are less equal but richer on average than those in rural areas. The increase in urban-rural median expenditure ratio from 1.72 to 1.96 suggests an increasing disparity between rural and urban areas. The decomposition of the Theil index also indicates that the urban-rural inequality slightly increased from 3.5 to 5.3 between 1992 and 1997[3].

Although this increase in urban-rural inequality does not seem significant, the trend is worrisome because poverty reduction in rural areas has been also less successful than in urban areas (Table 4.2). To measure poverty, I use three different indices: two headcount poverty ratios and the poverty gap index. The headcount poverty ratio is defined by the proportion of households below a given poverty line. Choosing a poverty line is always controversial because it is somewhat arbitrary. Therefore, here I calculate two poverty lines. First, I calculate a poverty line that is based on the expenditures necessary to be able to afford a food basket of 2100 calories for every household member, and then is adjusted upward to include other needs. The measure of 2100 calories is the standard used by the World Bank to approximate the number of calories needed per day

[3] The Theil index for urban-rural inequality is calculated using the formula:

$$T_{urban-rural} = T_{national} - \frac{\sum Y_{urban}}{\sum Y_{total}} T_{urban} - \frac{\sum Y_{rural}}{\sum Y_{total}} T_{rural}$$

for a human being to have an adequate diet (Glewwe et al., 2000). Since different groups of people have different metabolism rates, however, the standard is admittedly imperfect. Furthermore, depending on household composition, these poverty lines may not capture the true household poverty status: a household with young children and a household with the same number of young adults have significantly different demands for food. Moreover, there is no guarantee that households that are able to purchase 2100 calories a day actually do so. However, given that there is no poverty measure that captures a household condition perfectly, the expenditure levels associated with dietary standards seem to be relatively reflective of household well-being.

To measure a second, more extreme type of poverty, I define households in *food poverty* as those whose actual household per capita expenditure is below the calculated expenditures required to afford 2100 calories per capita per day. These households would not be able to afford the healthy food basket defined above, even if they chose to purchase it. In Vietnamese currency, the regular poverty lines are translated into 1,160,343 dong in 1992 and 1,789,871 dong in 1997 (approximately US$83 and $129 respectively), in adjusted 1998 prices (Glewwe et al., 2000).

Both the poverty line and the food poverty line are poverty headcount measures; in other words, they count the number of people or the proportion of the population who meet the definition of "poor." A downside to using headcount poverty ratios is that they are not capable of measuring the depth of poverty. Consider the following thought experiment. If one poor household transfers resources to another, extremely poor household, the latter may become able to secure adequate nutrition. However, this reallocation does not affect a poverty headcount measure, because both households are

still considered poor. Thus, a headcount poverty ratio changes only when a household moves out of or falls into poverty.

In contrast, the poverty gap is sensitive to all transfers from the poor to the less poor. It is defined by:

$$P = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{z - x_i}{z}\right), (x_i \le z), \tag{4.2}$$

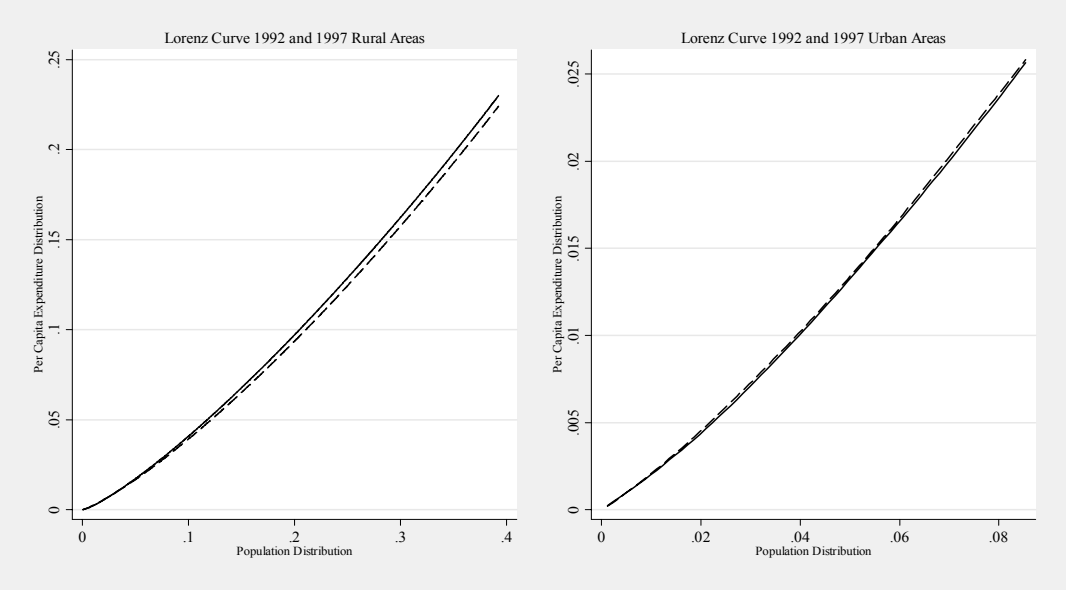
where z is the poverty line, x_i is per capita expenditures of household i, and N is the number of households. The greater the difference between individual households' expenditures and the poverty line, the bigger the poverty gap index becomes.

The changes in poverty measured in Table 4.2 illustrate the dramatic decrease in poverty in Vietnam between 1992 and 1997. Nationally, all three measures fell dramatically. The poverty headcount measure fell from 50.5% of the population to 33.5%, or by 34% (row 1, columns 1 and 4). The food poverty measure did not drop as much, decreasing from 16.8 to 12.4%, or by 25% (row 2). However, food poverty was nearly eradicated entirely in urban areas; by 1997, only 1.2% of urban households were in food poverty. Of the three measures, the poverty gap measure fell the farthest; it dropped from 28.7 to 17.7%, a decrease of 43% (row 3).

The significant decrease in households living in poverty accompanied by the slight increase in inequality suggests that the unequal distribution of benefits from economic transition did not necessarily exacerbate the condition of the poor in Vietnam, consistent with the implications of the Lorenz curves presented at the beginning of this section. However, two factors still seem important. First, poverty reduction was not nearly as successful in rural areas as in urban areas. Secondly, food poverty, the more extreme of the two headcount measures, only decreased by 23% in rural areas, from 19.4

Figure 4.2 Lorenz Curves below Poverty Line

Rural Areas Urban Areas



———— Lorenz Curve in 1992 --------- Lorenz Curve in 1997

to 14.9% (columns 2 and 5). These statistics, along with smaller declines in the poverty headcount and poverty gap measures, indicate that people in rural Vietnam still experience extreme poverty. The difference in poverty reduction between rural and urban areas is also illustrated in Figure 4.2, which shows the Lorenz curves below the poverty headcount line for rural and urban areas; the share of total expenditures among poor households slightly increased in urban areas, while decreasing in rural areas. Although national poverty was dramatically reduced between 1992 and 1997, the rural-urban difference in poverty reduction suggests that households in rural areas that remained poor became relatively worse off. However, I cannot conclude that these households below poverty line in 1992 and 1997 are the same without tracking individual household expenditures, which I will do in following sections.

In this section, I found that inequality increased slightly in Vietnam between 1992 and 1997. This result is not surprising given that inequality seemingly increased in many

formerly planned economies soon after transition. What is surprising, however, is that the increase in inequality in Vietnam remained minimal between 1992 and 1997. I find that inequality is somewhat higher in urban than rural areas, but urban areas are far better off, and have lower levels of poverty. Most importantly, the reduction in poverty was distinctly less successful in rural areas and among the poorest. These observations are consistent with previous studies that found urban households to be more successful during the transition in Vietnam.

Assuming rural residents are not artificially constrained to remain in rural areas, one might expect migration to occur, as rural residents believe that expected wages are higher in urban areas (Harris and Todaro, 1970). However, it is unclear whether migration would mitigate or exacerbate inequality. I will consider the effects of migration on rural areas in section 7.

5. CATEGORIZING HOUSEHOLDS

In the previous section, I showed that the distribution of the benefits from the economic transition is unequal across urban and rural areas. One of the objectives of this paper is to identify the characteristics of households that experienced more or less welfare improvement relative to others. In order to carry out this analysis, I need to consider measures of welfare improvement. While income and expenditure measures are most commonly used in development economics literature, there is no consensus about which welfare measure best reflects the true well-being of a household. Ideally, income and expenditure measures are supplemented by health and education indicators.

Even though expenditures, health, or education measures alone only reflect one aspect of household welfare, household expenditures are considered one of the most significant determinants of health status and education levels of household members. Several researchers have found this true in the VLSS data. For example, Wagstaff and Doorslaer (2001) find that the inequality in children's malnutrition measured by height for age is mainly attributed to household consumption and unobserved commune characteristics. Trivedi's study (2002) also suggests a strong association between health utilization and income levels. With regard to education indicators, I find that household per capita expenditures and expenditures on education per child are positively correlated in both 1992 and 1997 (0.48 and 0.53 respectively). Thus, it is safe to conclude that at least in the VLSS, household per capita expenditures are reasonable measure of household welfare indicator.

Expenditures are preferable to income as a measure of household welfare for several reasons (Deaton, 1997). First, short-term income fluctuations may not affect the

immediate well-being of the household. Households often smooth consumption at the times of economic shocks by using their savings or borrowing. Thus, low income of a particular year due to unexpected shocks might not affect the household's long-term welfare. Second, income can be saved for future consumption. Particularly in Vietnam, roughly 75% of the households in the sample have accumulated savings between 1992 and 1997, which makes household income a less accurate measure of current household welfare. Third, it is often more difficult to collect accurate data on income than to do so for expenditures because of informal earnings, which are hard to recall accurately.

In order to measure the change in well-being of households, I categorized the sample of 4302 households into "winners" and "losers" in three different ways.[4] The first two measures reflect the changes in the well-being of the household relative to the others. While these measures recognize households that benefited the most from transition, the relative level of benefits does not reflect the absolute welfare condition of the household. For example, households that experienced a dramatic improvement in consumption might still live in poverty in 1997. On the other hand, some households whose welfare improvement was small relative to the others may have escaped poverty between 1992 and 1997. In order to capture the absolute level of household welfare, the third categorization uses the poverty line calculated in the previous section.

5.1 Expenditure Growth Rates

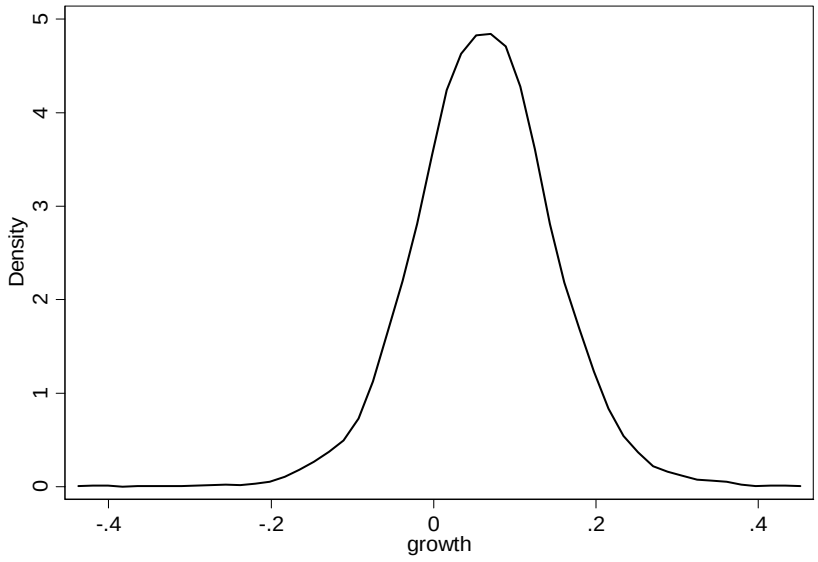
The first measure calculates the average annual growth of expenditures over the study period. The growth rate, *r*, was calculated by:

[4] Although there were 4304 households for which data were available in both 1992 and 1997, I had to drop two households due to missing observations.

$$r = \{ln(\text{per capita expenditure 98}) - ln(\text{per capita expenditure 92})\}/t \quad (8.1)$$ [5]

where t is the time between the two surveys. Growth in real expenditures per capita captures the improvement in household welfare directly. To categorize households as "winners" or "losers" in transition, I first analyzed the distribution of growth rates using a kernel density (Figure 5.1). Had there been obvious break points in the distribution, I could have used them as thresholds for grouping winners and losers. However, the figure shows that the distribution is approximately normal and smooth. Therefore, I used the top and bottom quartiles to group the households into fast-growing (winners) and slow/negative-growing (losers). The 1077 households with growth rates above 11.6 percent per year are grouped as winners, and the 1066 households with growth rates lower than 0.8 percent per year are grouped as losers. Although the thresholds of the 25th

Figure 5.1 Distribution of Annual Growth Rate



[5] The equation for growth rate is obtained by $(pc\exp 92)(1+r)^t = (pc\exp 97)$. This will result in $\ln(1+r) = (\ln(pc\exp 97) - \ln(pc\exp 92))/t$. However, using first order Taylor Series, ln(1+r) will converge to r when r is small.

and 75th percentiles are somewhat arbitrary, they correspond nicely to households with stagnant or declining per capita expenditures and households with extremely rapid growth.

5.2 Expenditure Quintiles

One of the important features of Vietnam's economic transition in the 1990s is high economic mobility across different income groups. In order to measure economic mobility of households relative to others, I first divided the sample into quintiles by household expenditures per capita in 1992 and 1997. Then, I cross-tabulated the households, specifically looking for those that moved from one quintile to another between 1992 and 1997. In this specification, I call any households that moved up by a quintile or more "winners," and similarly I call households that moved down by a quintile or more "losers." Using this specification, winners and losers only reflect whether or not household expenditures per capita increased/decreased relative to other households. This

Table 5.1 Cross-tabulation of Quintiles in 1992 and 1997

	1997 quintiles				
	1	2	3	4	5
1992 quintiles					
1	437	**237**	**121**	**56**	**10**
	(10.8%)	**(5.9%)**	**(3.0%)**	**(1.4%)**	**(0.2%)**
2	*241*	246	**211**	**119**	**43**
	(6.0%)	(6.1%)	**(5.2%)**	**(3.0%)**	**(1.1%)**
3	*121*	*205*	225	**225**	**85**
	(3.0%)	*(5.1%)*	(5.6%)	**(5.6%)**	**(2.1%)**
4	*46*	*135*	*211*	274	**194**
	(1.1%)	*(3.3%)*	*(5.2%)*	(6.8%)	**(4.8%)**
5	*16*	*37*	*93*	*186*	528
	(0.4%)	*(0.9%)*	*(2.3%)*	*(4.6%)*	(13.1%)

Notes: Winners are in **bold**; losers are in *italics*.

categorization reflects neither the degree of welfare improvement nor the final well-being of the households.

Table 5.1 shows the cross-tabulation of quintiles between 1992 and 1997. Other than the richest and poorest quintiles, the relative rankings are remarkably fluid. Of the 42.4% of households that remained in the same quintile in 1997, over 20% are in either the top or the bottom quintiles. On the other hand, more households in the poorest than any other quintile of 1992 experienced an increase in household expenditures relative to the others. Roughly half the households in the bottom quintile in 1992 moved up quintiles. In fact, there is a weak negative correlation of -0.27 between households' expenditure levels in 1992 and their annual growth rates; the lower the initial expenditure level in 1992 was, the faster household expenditures grew in the next five years. This economic mobility between the two surveys demonstrates that the economic gains during the 1990s were greater for poor households than for the rich.

5.3 Poverty Line

Finally, I base my third categorization of winner and losers on the poverty line described in the previous section. I identify the households that moved above the poverty line as "winners." A household is specified as a "loser" in this categorization if it moved below the poverty line between the two surveys. In addition, I grouped households that stayed below the poverty line as an independent specification from "losers" (called "poor" in the table). In the poverty specification, 1440 households (33.5% of the sample) live below poverty line in 1997 as opposed to 2171 households (50.4%) in 1992.

Table 5.2 summarizes the number of households in different categories. Roughly one fourth of households in the sample can be categorized as winners by each definition.

Table 5.2 Descriptive Statistics of Three Household Welfare Measures

	Total	Rural	Urban
Definition1	(Growth rates)		
Winners	1077	801	276
Losers	1066	920	146
Definition2	(Quintiles)		
Winners	1301	1080	221
Losers	1291	1147	144
Definition3	(Poverty line)		
Winners	1004	875	129
Losers	273	252	21
The poor	1167	1119	48
By All Definition			
Winners	573	481	91
Losers	511	482	29

However, they are not always the same households. Only 573 of 4302 (13.3%) households are classified as winners by all three definitions, 83.9 percent of which reside in rural areas. This rural-urban ratio is not significantly different from that of the sample, in which the 81.2 percent of the households live in rural areas; thus, the numbers of overall winners in rural and urban areas are roughly equal.

In contrast, a greater portion of the 511 households classified as losers by any definition (including "poor" in definition 3) live in rural areas (94.3%). This trend is consistent for all definitions; a loser is more likely to be a rural household than urban relative to the sample distribution. Given that the initial household expenditure level in 1992 was nearly twice as high in urban areas as it was in rural areas, the loser ratio implies an increase in urban-rural inequality both in relative and absolute terms. This outcome is consistent with the statistics in the previous section. Although the poor appear to have benefited from the economic transition more than the rich at the national level, rural households in deep poverty struggled to escape from poverty.

In the regression analysis following this section, I will use the first winner/loser categorization defined by growth rate to determine the household characteristics and decisions that improved household welfare. By using the winner/loser specification, I can separate the determinants that accelerated expenditure growth among the fast-growing households and among the slow-growing households.

6. METHODOLOGY

This section describes the econometric models which will be used in the analysis in the next section. In the regression analysis that follows, I have three main objectives. First, I want to understand which household characteristics determine household consumption levels and which factors are correlated in each cross-section with higher and lower levels of consumption. However, as I will explain below, in the cross-section I cannot control for some interesting variables that are endogenously determined with household expenditures. Therefore, I will extend my methodology to study the effects of endogenous household decisions, which leads to my second objective of the study—to analyze the impact of credit and migration, variables with potentially powerful policy implications, on household expenditures. Third, I will focus on the top and the bottom ends of the growth distribution and analyze factors that increased the likelihood of household experiencing exceptionally fast or slow growth during the study period.

First, I consider a hedonic model in which the logarithm of per capita consumption of household *i* at time *t* is determined by a vector of exogenous household characteristics *x*:

$$\ln y_{it} = \beta x_{it} + \varepsilon_{it} . \tag{6.1}$$

This model is useful in directly comparing the magnitude and significance of the impact of each exogenous characteristic on expenditure levels between rural-urban areas and over time. I use commune-fixed and region-fixed effects to test the significance of regional differences. If the coefficients are statistically significant and similar in magnitude between the two fixed models, the results can be generalized as national trends.

If the two fixed models yield different results, there is intra-regional or intra-commune heterogeneity that are not fully explained by one of the two models.

Second, I analyze the impacts of access to credit and participation in migration on changes in household expenditure levels. These two economic variables have potential policy implications. If, for example, credit access had a positive impact on expenditure growth, the Vietnamese government should clearly pursue the expansion of rural credit access. If migration contributed to expenditure growth, the policies to facilitate migration (e.g. investment in infrastructure and deregulation of labor market) could encourage expenditure growth in rural areas. These variables related to household decisions are distinctly different from household characteristics such as household demographics and assets, because the government policy can quickly affect household decision-making. To study migration and credit, there is a distinct advantage of using expenditure growth, as opposed to static expenditure levels. When expenditure growth is used as a dependent variable, the model controls for unobserved household characteristics that do not vary over time. Because the regression tests the impact of a household decision on the change in per capita expenditure of the same household, the model eliminates the effect of inherent heterogeneity between households. In this regression model, the unobserved characteristics that affect household expenditure growth are absorbed by the error term. In other words, the error term is a function of a set of fixed, unobserved characteristics α:

$$\varepsilon_{it} = \alpha_i + u_{it} \tag{6.2}$$

Replacing equation 6.2 in 6.1 yields:

$$\ln y_{it} = \alpha_i + \beta x_{it} + u_{it}\,. \tag{6.3}$$

By taking the difference of the function between 1992 and 1997, I obtain the second model which measures the change in per capita expenditures. Because α_i is a set of unchanging variables by definition, $\Delta\alpha$ is 0; therefore, the regression function can be simplified as:

$$\Delta \ln y_{it} = \beta \Delta x_{it} + \Delta u_{it} \tag{6.4}$$

This model controls for the unobserved characteristics represented in α. Note that if we add a year dummy variable, we could just add the constant back into equation (6.4).

However, the model may still have the problem of reverse causality or omitted variable bias if the explanatory variables are not exogenous. It is not clear if the changes in household decisions, such as obtaining credit or sending migrants, are made because of increased household expenditure level, or vice versa. One way to control for this endogeneity between dependent and explanatory variables is to use a 2SLS model by instrumenting potentially endogenous variables. Consider a model:

$$y_1 = \alpha_1 z_1 + \beta_2 y_2 + u_1 \tag{6.5}$$

$$y_2 = \alpha_2 z_1 + \alpha_{22} z_2 + u_2 , \tag{6.6}$$

where y_1 is the growth rate and y_2 is the endogenous variable such as credit access and migration. Estimating y_2 with an instrumental variable, Z_2, exogenous to y_1, the model controls for the potential reverse causality between y_1 and y_2. However, if I run the two stages sequentially, the standard error in the second stage regression will be biased, so the estimator is inefficient. The equations for sequential 2SLS can be written as:

$$y_1 = \alpha_1 z_1 + \beta_2 \hat{y}_2 + u_1 \tag{6.5'}$$

$$\hat{y}_2 = \hat{\alpha}_2 z_1 + \hat{\alpha}_{22} z_2 . \tag{6.6'}$$

The error term in the first stage disappears in equation 6.6 because the actual u_2 is unobserved and E(u_2) = 0. In order to account for the variance of the first stage regression, I use 2SLS simultaneous regression which runs the two stages simultaneously and adjusts the variance-covariance matrix.

Third, I will estimate probit models that identify which characteristics of households lead some households to be winners and losers in transition. I will use the winner/loser specifications defined by growth rates as dependent variables. Some household decisions may affect only losers, preventing the household from experiencing negative expenditure growth, while other behaviors may have particularly significant impact on the fast-growing group. This last set of regressions allows me to distinguish the effects of household decisions on the top and bottom ends of the growth distribution. The model is similar to the 2SLS simultaneous regression. One important difference is that the dependent variables are dummy variables ($y_{1'} = 1[y_1>0]$). A probit model is estimated by maximizing the likelihood of an event, y, to occur. In equation 6.5, variances in the two stages are both fixed if the model is linear. In a non-linear, probit model this assumption does not hold: the variance changes depending on the probability function, E($P(Y_i=1)$) and E($P(Y_i=0)$). If I use the 2SLS linear model, the standard errors will be biased because of the violation of the assumption of homoscedasticity. In order to avoid this problem, I use a model which adjusts the standard errors of the first stage regression in a probit estimator, originally developed by Maddala (1983). The correct standard error in the second-stage-probit model is calculated with $\hat{u}_2$ and Var($\hat{u}_2$) in equation 6.6' (Wooldridge 2002, 472-477).

Note that this model can be adopted only under the assumption of joint normality of (u_1, u_2). I create instruments for access to credit and migration from commune characteristics; the proportion of migrants in the commune in 1992 is used to instrument the change in the number of migrants between 1992 and 1997 and the availability of certain types of credit institutions is used to instrument the change in loan size between the two years. Neither the proportion of migrants in the commune nor the availability of formal credit should be correlated with household level expenditure growth. The suitability of the error-term-normality assumption depends partially on the strength of instruments to predict the endogenous variables. Results from the first stage regressions show that migration network is a strong predictor of migration, while the presence of credit institutions is not. Thus, I only adopt the assumption of normality in error terms and use the Maddala model to test the impact of migration on whether or not households fall into the "winner" or "loser" categories.

7. RESULTS

This section analyzes determinants of household expenditure levels and growth. Table 7.1 shows descriptive statistics of the sample used in the regression analyses. Social and economic conditions uniformly improved between 1992 and 1997 on average, with lower poverty rates for all regions, increasing education levels and agricultural assets, and extending credit access. In the first subsection, I report regression results on expenditure levels in 1992 and 1997 and compare the significance of exogenous and observable household characteristics in rural areas to urban areas, and also among poor households to non-poor households. The results show that household demographic composition, land assets, the educational attainment of the household head, and the household head's participation in the non-agricultural sector are particularly important in increasing household expenditure levels, although the significance of these factors greatly varies between rural and urban areas. Furthermore, the regional differences in 1992 and 1997 clearly illustrate the disparity between the North and South.

Second, I analyze the importance of access to credit in rural areas. I am particularly interested in the implications of the expanding formal credit market in rural areas; the proportion of households with formal credit almost doubled in rural areas between the two surveys (Table 7.1). While government banks successfully extended loans to the poor between 1992 and 1997, I did not find a strong, causal impact of credit on expenditure growth.

Third, I consider seasonal migrants as a possible, alternative choice for the financially constrained households to improve their welfare. Similar to the expansion of access to credit, the proportion of households with seasonal migrants dramatically

Table7.1 Descriptive Household Characteristics

	1992				1997			
	Rural	(Poor)	Urban	(Poor)	Rural	(Poor)	Urban	(Poor)
Observations	3494	1994	808	177	3396	1360	906	80
Household Expenditures (000 dong)*	1507	1171	2591	1296	1994	1391	3833	1535
Percentage of Poor Household (%)								
Northern Uplands		73.0		36.5		59.7		8.4
Red River Delta		59.3		11.7		35.3		6.8
North Central Coast		69.3		48.4		44.9		10.4
South Central Coast		50.3		26		37.1		11.5
Central Highlands		60.9		--		44.4		--
South East		38.2		11.7		13.6		4.7
Mekong Delta		42.7		20.2		36.9		13.7
Household Characteristics								
Household Size	5.0	5.3	5.0	5.5	4.8	5.4	4.5	5.9
Male Household Head (%)	78.0	79.9	56.8	55.4	77.0	79.7	67.4	68.8
Age of Household Head	45.1	43.3	47.3	45.8	47.7	45.3	59.6	46.1
Education Attainment (yrs) (household head)	5.6	5.4	7.3	5.8	6.1	5.6	7.8	5.8
Ethnicity—Kinh (%)	84.8	79.5	89.5	94.9	84.2	71.4	91.4	96.3
Assets								
Own annual crop land	88.4	90.1	13.9	26.0	82.3	87.7	18.3	31.3
Own perennial crop land (%)	0.1	0.0	0.3	0.0	24.5	21.7	5.82	9.04
Agri. Land Area (m^2)	4577	4132	6217	5576	5770	4964	4568	6399
Motorbike (%)	3.9	1.2	21.3	1.7	9.9	1.7	32.6	1.3
Bicycle (%)	64.4	59.6	72.9	62.7	57.9	54.4	67.8	58.8
Credit and Migration								
Informal Credit (%)	49.3	52.3	36.6	44.6	34.9	37.9	26.8	43.8
Formal Credit (%)	16.4	15.1	8.5	11.3	30.3	31.1	11.9	12.5
Banks for the Poor (%)					6.2	8.5	3.1	6.3
Other Formal Credit (%)					24.4	22.6	9.1	6.3
% of household with savings	43.0	32.0	69.3	45.8	90.1	82.9	94	83.5
Median savings rate†	6.8	5.8	11.2	4.7	7.2	3.2	14.1	5.3
Seasonal Migrants (%)	1.9	2.5	-	-	10.6	10.6	-	-
Employment (household head)								
Agriculture (%)	64.74	68.6	18.7	31.6	61.5	66.5	17.7	31.3
Skilled Labor (%)	2.09	1.4	5.9	5.7	7.8	7	13.5	10
Unskilled Labor (%)	3.61	3.9	5.6	7.3	5.7	7.1	5.2	15
Sales (%)	0.54	0.2	5.9	3.6	4.8	2.9	19.9	11

*Household Expenditures is median household per capita expenditures,
†Median savings rate is measured by the ratio of the stock of savings in 1997 to the household total expenditures.

increased between 1992 and 1997. The regression results show that an extra seasonal migrant in the household has a positive and significant impact on per capita expenditure growth, although it appears that there is a substantial variance across regions and income groups.

7.1 Household per capita Expenditure Levels in 1992 and 1997

Household expenditure levels in Vietnam increased by 32% in rural and 48% in urban areas between 1992 and 1997 (Table7.1, row 2). As the country experiences gradual economic reform and growth, the determinants of household expenditure may change. In this subsection, I focus on exogenous household characteristics and compare the significance of expenditure determinants across population groups and over time. Previous studies of Vietnam have pointed to the significance of commune characteristics, such as infrastructure and facilities, and regional differences in household welfare. By using commune and regional fixed effects, I can capture the significance of regional and communal characteristics[6]. The specifications of the regressions are similar to that of Glewwe et al. (2000). One main difference in my specifications, however, is that separate regressions are run for urban and rural areas. Because household characteristics and activities are significantly different between rural and urban areas, estimating a single model may not capture important urban-rural differences.

The regression results for household demographic composition, human capital and ethnicity, occupation of the head, and land holdings are summarized in Tables 7.2 to 7.5, respectively. In all regressions among rural poor, rural, and urban households, I used

[6] I will use commune fixed effects models in the discussion because they control for more heterogeneity than regional fixed effects models.

Table 7.2 Coefficients on Household Demographic Composition

	1992				1997			
	Commune Fixed		Region Fixed		Commune Fixed		Region Fixed	
Rural								
# of male elderly	0.1168	(0.022)***	0.0942	(0.025)***	0.0631	(0.021)***	0.0797	(0.023)***
# of females elderly	0.1049	(0.017)***	0.1193	(0.019)***	0.0666	(0.017)***	0.0583	(0.018)***
# of females, age 18-55	0.0456	(0.012)***	0.0636	(0.013)***	0.0568	(0.012)***	0.0555	(0.013)***
# of males, age 18-60	0.0722	(0.011)***	0.0847	(0.012)***	0.0752	(0.011)***	0.0808	(0.013)***
# of children, age 6-17	0.0330	(0.007)***	0.0323	(0.008)***	0.0380	(0.007)***	0.0256	(0.008)***
Rural Poor								
# of male elderly	0.0494	(0.022)**	0.0452	(0.023)*	0.0276	(0.021)	0.0327	(0.023)
# of female elderly	0.0541	(0.016)***	0.0659	(0.018)***	0.0401	(0.017)**	0.0538	(0.018)***
# of females, age 18-55	0.0150	(0.011)	0.0266	(0.012)**	0.0319	(0.012)***	0.0280	(0.013)**
# of males, age 18-60	0.0602	(0.011)***	0.0693	(0.012)***	0.0405	(0.011)***	0.0451	(0.012)***
# of children, age 6-17	0.0218	(0.006)***	0.0230	(0.007)***	0.0236	(0.007)***	0.0185	(0.008)**
Urban								
# of male elderly	0.0905	(0.047)*	0.0774	(0.049)	0.0861	(0.045)*	0.0567	(0.047)
# of female elderly	0.1200	(0.044)***	0.1268	(0.046)***	0.0774	(0.038)**	0.0482	(0.040)
# of females, age 18-55	0.0840	(0.024)***	0.0887	(0.024)***	0.0661	(0.025)***	0.0673	(0.027)**
# of males, age 18-60	0.0585	(0.023)**	0.0575	(0.024)**	0.0577	(0.023)**	0.0437	(0.025)*
# of children, age 6-17	0.0298	(0.019)	0.0339	(0.020)*	0.0214	(0.021)	-0.0014	(0.022)

Note: Dependant variable is logarithm of household per capita expenditures.
Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

the same set of explanatory variables so that I can compare changes in significance and magnitude of impact of each variable on household consumption level. Although the model also controls for other factors, such as logarithm of household size and assets, here I present several variables of particular interest.

Most coefficients for household demographics are significant and positive. Any adult member of the rural household is likely to participate in agricultural labor, leading to higher income and expenditure levels. An additional working-aged man increases household expenditure level more than a working-aged woman does in rural areas (rows 3 and 4). Since agriculture requires physical labor, the male worker may have higher productivity than a female worker in rural areas. The coefficients on the number of female adults are greater in urban areas than in rural areas. Not only are there greater employment opportunities for women in urban areas, but also a greater proportion of

urban household heads, who are generally the primary income earners, are female (Table 7.1, row 11). Thus, female adults contribute more to household income in urban areas than in rural areas. In contrast, the number of children between 6 and 17 has a significant impact on household expenditure levels only among the rural households. In rural areas children generally help on the farm and start working earlier than urban children. The coefficients are even greater in 1997, indicating that children's contribution to household expenditure level slightly increases over time. However, positive coefficients on the number of children may not be reflecting child labor alone. For example households with children between 6 and 17 generally have expenditures on education. The enrollment rate for primary school among the poor has also increased by 10 percentage points for the poorest quintile in the 1990s (Nguyen, 2002). In addition to the enrollment increase, Edmonds and Pavenik (2003) find that an increase in farm income due to the rising price of rice in the 1990s is associated with a significant decline in child labor in Vietnam. Thus, the increasing impact of the number of children between 6 and 17 on expenditure levels is unlikely reflecting the expanding child labor.

The coefficients on the age of household head also differ between rural and urban areas and over time (Table7.3, rows 1, 5, and 9). In rural areas, the age of household head is correlated with his or her experience level in agriculture because most households had been farming for decades, and experience is important in agriculture. Among the rural poor in 1992, age has positive, declining effect on household expenditures. However, in 1997 the coefficients are insignificant which may mean that either agriculture, or the household head's experience level, has become a less important determinant of expenditures. Among all rural households, the coefficient on head's age

Table 7.3 Coefficients on Human Capital and Ethnicity

	1992				1997			
	Commune Fixed		Region Fixed		Commune Fixed		Region Fixed	
Rural								
Head's Age	0.0194	(0.003)**	0.0191	(0.004)***	0.0117	(0.003)***	0.0171	(0.004)***
(Head's Age)Sq	-0.0002	(0.000)***	-0.0002	(0.000)***	-0.0001	(0.000)**	-0.0001	(0.000)***
Head's Schooling	0.0220	(0.002)***	0.0240	(0.002)***	0.0287	(0.002)***	0.0296	(0.002)***
Average Schooling	0.0233	(0.002)***	0.0232	(0.002)***	0.0129	(0.002)***	0.0132	(0.003)***
Chinese	0.0446	(0.100)***	0.1919	(0.110)*	0.0456	(0.105)	0.1314	(0.112)
Minorities	-0.1487	(0.030)***	-0.1589	(0.022)***	-0.1845	(0.029)***	-0.2023	(0.021)***
Rural Poor								
Head's Age	0.0078	(0.003)***	0.0054	(0.003)*	0.0033	(0.004)	0.0047	(0.004)
(Head's Age)Sq	-0.0001	(0.000)**	-0.0001	(0.000)	0.0000	(0.000)	0.0000	(0.000)
Head's Schooling	0.0107	(0.002)***	0.0127	(0.002)***	0.0148	(0.002)***	0.0143	(0.002)***
Average Schooling	0.0095	(0.002)***	0.0099	(0.002)***	0.0073	(0.003)***	0.0086	(0.003)***
Chinese	-0.1452	(0.129)	-0.0540	(0.135)	-0.0879	(0.112)	0.0470	(0.118)
Minorities	-0.1021	(0.028)***	-0.1104	(0.018)***	-0.0390	(0.028)***	-0.0487	(0.018)***
Urban								
Head's Age	0.0099	(0.008)	0.0047	(0.008)	0.0055	(0.008)	0.0098	(0.008)
(Head's Age)Sq	-0.0001	(0.000)	0.0000	(0.000)	-0.0216	(0.033)	-0.0296	(0.035)
Head's Schooling	0.0212	(0.005)***	0.0281	(0.005)***	0.0251	(0.004)***	0.0324	(0.005)***
Average Schooling	0.0306	(0.005)***	0.0294	(0.006)***	0.0181	(0.005)***	0.0163	(0.005)***
Chinese	0.1234	(0.069)**	0.2401	(0.063)***	0.0118	(0.065)	0.0952	(0.062)
Minorities	-0.0328	(0.107)	0.0427	(0.111)	-0.0721	(0.118)	0.0682	(0.124)

Note: Dependant variable is Logarithm of household per capita expenditures.
Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

is still significant in 1997, but the impact of an additional year of the head's experience on expenditures declined from 1.9 to 1.1%. As the non-agricultural sector expands in rural areas, skills may be becoming more important in determining the workers' wages than experience. The results for household head's education attainment support this conjecture—skills beyond agriculture become more important in the 1990s (row 3 and 7). The coefficients on educational attainment by household head increase over time in both rural and urban areas. However, they are slightly lower for rural than urban areas, and are even less important for the rural poor. Thus, while educational attainment is a significant determinant of household expenditure level, the results seem to suggest that

the returns to education in the agricultural sector (or for households less likely to have off-farm work) are not as high as in other sectors.

The worsening gap in consumption levels between ethnic minorities and the Vietnamese Kinh is a worrisome trend (row 6). The negative and significant coefficients on ethnic minorities in rural areas increase over time, although the disparity is closing among the rural poor. More than fifty different ethnic minorities had been socially and economically marginalized in Vietnam due to language barriers and their isolated communities. Although the social environment that surrounds minorities have much improved in the past decades through international attentions and various poverty alleviation projects, historical disadvantage and geographical isolation make it difficult to integrate them into the rapidly growing economy.

Another important difference between rural and urban areas is the primary occupation of household heads. In studying the significance of household head's

Table 7.4 Coefficients on Household Head's Occupation

	1992				1997			
	Commune Fixed		Region Fixed		Commune Fixed		Region Fixed	
Employment (agriculture =0)								
Rural								
Skilled labor	0.1157	(0.043)***	0.1469	(0.048)***	0.0718	(0.024)***	0.0879	(0.025)***
Unskilled labor	-0.0184	(0.034)	-0.0082	(0.037)	-0.0491	(0.027)*	-0.0523	(0.029)*
Sales	0.2183	(0.083)***	0.3244	(0.092)***	0.1771	(0.028)***	0.1720	(0.031)***
Professional work	0.1807	(0.038)***	0.1844	(0.042)***	0.1561	(0.041)***	0.1841	(0.045)***
Rural Poor								
Skilled labor	0.0027	(0.049)	0.0212	(0.052)	0.0553	(0.027)**	0.0699	(0.027)***
Unskilled labor	0.0296	(0.030)	0.0329	(0.032)	0.0078	(0.026)	0.0265	(0.027)
Sales	-0.0679	(0.126)	0.0067	(0.137)	0.1017	(0.037)***	0.0863	(0.040)**
Professional work	0.0759	(0.043)*	0.0435	(0.047)	0.0101	(0.063)	0.0498	(0.069)
Urban								
Skilled labor	0.0868	(0.076)	0.0375	(0.078)	-0.0239	(0.058)	0.0187	(0.062)
Unskilled labor	0.0823	(0.080)	0.0153	(0.081)	-0.1445	(0.075)*	-0.1524	(0.080)*
Sales	0.0363	(0.077)	0.0521	(0.079)	0.0317	(0.056)	0.0407	(0.059)
Professional work	0.2149	(0.059)***	0.1713	(0.061)***	0.0801	(0.067)	0.0833	(0.072)

Note: Dependant variable is Logarithm of household per capita expenditures.
Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

occupation choice on household expenditures, I am concerned that unobserved factors correlated with both household expenditure level and occupation choice may affect the coefficient estimates. In order to limit the problem, I use the occupation held by household heads for more than twelve months. In rural areas, skilled labor, sales, and professional work have significantly positive impacts on household expenditure level in both years (Table 7.4). Particularly, households with their heads in sales industry have nearly 20% higher expenditure level than households in agriculture on average (row 4). Among the poor, skilled labor and sales are positive and significant in 1997 but not in 1992, perhaps because so few household heads held those occupations in 1992: 1.4% of rural poor are in skilled labor and 0.2 % in sales. This change indicates that off-farm opportunities for the poor expanded between 1992 and 1997. Conversely, since a large portion of the poor households are moving into skilled labor and the sales industry, the same coefficients on skilled labor and sales fall among all rural households in 1997. In other words, poor households moving into the non-agricultural sectors are pulling down the coefficients on skilled labor and sales industry by reducing the average expenditure levels of households in that category. These results confirm the increasing advantage of leaving the agricultural sector and moving into more skill-intensive occupations for poor households in Vietnam.

The variables related to agricultural land area have significant but inconsistent coefficients across different specifications (Table 7.5). The significance of land holdings has a particularly important implication in rural areas and for the poor; it is a variable asset for financially constrained households. Land is disaggregated into two categories: annual crop land, on which crops such as rice and other grains are typically grown; and

Table 7.5 Coefficients for Land Holdings

	1992				1997			
	Commune Fixed		Region Fixed		Commune Fixed		Region Fixed	
Rural								
Log(annual crop land)	0.0151	(0.003)***	0.0068	(0.002)***	0.0111	(0.003)***	-0.0004	(0.002)
Log(perennial crop land)	-0.0035	(0.033)	-0.0027	(0.037)	0.0117	(0.002)***	0.0083	(0.002)***
Rural Poor								
Log(annual crop land)	0.0167	(0.003)***	0.0051	(0.002)**	0.0117	(0.003)***	0.0031	(0.003)
Log(perennial crop land)					0.0081	(0.003)***	0.0057	(0.002)**
Urban								
Log(annual crop land)	-0.0057	(0.008)	-0.0063	(0.007)	-0.0096	(0.007)	-0.0217	(0.006)***
Log(perennial crop land)	0.0536	(0.040)	0.0479	(0.042)	0.0054	(0.011)	0.0037	(0.009)

Note: Dependant variable is Logarithm of household per capita expenditures.
Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

perennial land, on which crops such as coffee, rubber, and fruits are grown. The descriptive statistics indicate a large expansion of perennial crop land between 1992 and 1997 (Table 7.1). This is likely due to improvements in land use rights after the enactment of the Land Law in 1993. Although a portion of urban households with agricultural land use rights increased between 1992 and 1997, agriculture was not a thriving economic activity in urban areas; thus, one would expect little impact of agricultural variables on expenditure levels in urban areas. I find that in 1992 land area for annual crop is significantly positive in increasing expenditure levels in rural areas. The importance of annual crop land in rural areas differs between the specifications with commune fixed effects and region fixed effects. For example, in rural areas the positive and significant coefficient disappears in 1997 in the model with region fixed effects, while the coefficient remains significant in the model with commune fixed effects. This implies that there are significant inter-regional differences in annual crop land in 1997. In fact, the median land area in the sample varies from 1000 to 3700m² by region and the mean from 2456 to 6270m². By both measures, the Mekong Delta had the largest land plots on average. Despite these variances, the significance of holding larger plots of

Table 7.6 Coefficients of Regional Variables

1992 Regions	Rural		Rural Poor		Urban	
(0=Northern Uplands)						
Red River Delta	-0.0459	(0.023)**	-0.0198	(0.019)	0.4630	(0.056)***
North Central Coast	-0.0887	(0.025)***	-0.0461	(0.021)**	-0.1193	(0.072)*
South Central Coast	0.1454	(0.028)***	-0.0457	(0.025)*	0.3106	(0.060)***
Central Highlands	0.2334	(0.042)***	0.0176	(0.038)		
South East	0.3010	(0.032)***	0.0345	(0.032)	0.4817	(0.060)***
Mekong Delta	0.3715	(0.025)***	0.1273	(0.024)***	0.4600	(0.057)***

1997 Regions	Rural		Rural Poor		Urban	
(0=Northern Uplands)						
Red River Delta	0.0061	(0.022)	-0.0188	(0.020)	0.1963	(0.053)***
North Central Coast	-0.0253	(0.023)	-0.0009	(0.021)	0.0932	(0.079)
South Central Coast	0.0238	(0.027)	-0.0771	(0.026)***	0.1292	(0.057)**
Central Highlands	0.1629	(0.041)**	-0.0831	(0.039)**		
South East	0.4187	(0.030)***	0.1705	(0.042)***	0.3913	(0.058)***
Mekong Delta	0.2009	(0.024)***	0.1079	(0.023)***	0.2228	(0.056)***

Note: Dependant variable is Logarithm of household per capita expenditures.
Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

annual crop land decreased between 1992 and 1997 in general. On the other hand, the significance of perennial crop land area in increasing household expenditure levels increases over time in rural areas. There are only few households in 1992 that owned the use-rights to perennial crop land; thus, none of the coefficients for perennial crop land in 1992 is significant. In 1997 nearly a quarter of rural households held the use-rights to perennial crops, 49% of which were households below poverty line in 1992. Thus, moving away from annual crops, such as rice and sugar cane, to perennial crops, such as rubber and coffee, appears to be a key to growing successfully in the agricultural sector.

Finally, coefficients on regions are summarized in Table 7.6. These coefficients show a clear disparity between the North and the South. Households in the South East, where Ho Chi Minh City is located, and the Mekong Delta have much higher expenditure levels than those in other regions. In rural areas, expenditures in the South East increase

from 30% higher than the base region (the Northern Uplands) to 42% higher in 1997. This may be a spillover effect from the rapid development of Ho Chi Minh City, which has made larger markets accessible for rural farmers. The coefficients are smaller among the poor, illustrating that the regional gaps are less significant for the lower income group. Over time the regional disparity in expenditure levels seems to widening with the magnitudes of the negative coefficients of regions falling behind (South Central Coast and Central Highlands) and the positive coefficient of the South East increasing. In contrast to the continuing disparity between the North and the South in rural areas, changes in the coefficients in urban areas appear to indicate closing gaps. The advantage of being in the South East, the Red River Delta, and the Mekong Delta over the Northern Uplands, which had the poorest urban areas in 1997, significantly falls[7]. This finding is consistent with the earlier descriptive analysis which showed the increasing inequality in rural areas and decreasing inequality in urban areas.

The regressions in this subsection analyzed the general household characteristics that determine household expenditure levels. The results show that there are significant differences between rural and urban areas. Particularly, the variables related to agricultural production, such as the land areas and the age of household head matter more in rural areas, while educational attainment is an important determinant of household expenditure levels for all groups. In addition, the regional variables confirm that the inequality between the North and the South is increasing, although the advantage of living in the South is mostly due to the growth in Ho Chi Minh City. Despite the improved economic performance in the Northern provinces during the 1990s, the

[7] Major cities in urban areas in each region are: Lao Cai (Northern Uplands), Hanoi and Hai Phong (Red River Delta), Da Nang (South Central Coast), Ho Chi Minh City (South East), and Tien Giang (Mekong Delta). Note that all provinces in the Central Highlands are classified as rural areas.

disparity with the South is still widening in rural areas. Because integration into the world market has been more active in the South, the Vietnamese government may need to continue to favor the North in its policies in order to help the poor regions from falling further behind.

7.2 Access to Credit

I now consider household behaviors that may directly affect household welfare; access to credit and participation in migration. Both analyses are restricted to rural households. Because poverty reduction was significantly less successful in rural areas between 1992 and 1997, as illustrated in section 4, I am particularly interested in the implications of expanding credit access and migration for rural poverty alleviation. There is also a data constraint: the information on commune characteristics, which is used to construct instrumental variables for credit and migration, is collected only from rural villages.

First, I consider access to credit. The lack of adequate financial resources often seriously constrains poor households from expanding their income-generating activities. Commercial banks are generally unwilling to lend to the poor—who do not have sufficient collateral and who reside in remote areas—where transaction costs are high. Furthermore, banks lack the ability to easily monitor rural loans because agriculture is spatially dispersed and monitoring costs are high. Better access to credit provides investment capital for long-term productivity enhancement and security to smooth consumption during times of negative economic shocks.

The reform in the financial sector of Vietnam started in 1987 after *Doi Moi* was officially implemented. Previously, the State Bank of Vietnam (SBV) operated as both a commercial and central bank, but after 1987 the effort to expand financial services to rural households led to the establishment of development banks and representative offices of foreign banks (Dinh, 2000). The most prominent financial institution in rural Vietnam in the 1990s was the Vietnam Bank for Agriculture and Rural Development (VBA). Established in 1988, the VBA specializes in loans for production purposes. Originally, the VBA was expected to operate like a commercial bank for rural farming households (ADB, 1996). However, as a study completed in the early 1990s indicates, poor farm households sought credit from the informal sector rather than from the VBA because of the high transaction costs (Dat, GDRC). Borrowers were forced to make multiple trips to the nearest branch to sign a contract, and small administration fee was required during every trip. In order to make credit more accessible to the poor who heavily depended on the informal credit market, the interest rates of the VBA were set lower than those of commercial banks, and the VBA started lending up to 500,000 Vietnamese dong[8] to rural households without collateral. This amount increased to 10 million dong by the end of the 1990s. Furthermore, the VBA formed joint-liability and joint-borrowing groups with nationwide organizations including the women's union and the farmers' association. Such collaboration reduces the risk of lending to the poor because of better monitoring mechanisms (Duong and Izumida, 2002). In addition, the government established the Vietnamese Bank for the Poor (VBP) in 1996, which specifically targets poor households. As a result, the total number of borrowers from government banks significantly increased in the mid-1990s.

[8] 500,000 dong was roughly $37 in 1992.

In rural Vietnam, the credit market is segmented into formal and informal sectors. This distinction is important because few government banks in the formal sector provide loans for consumption purposes (Duong and Izumida, 2002). Formal credit used for production purposes could increase household consumption levels in the long term by directly affecting income-generating activities. In contrast, informal credit is commonly used for consumption, particularly during times of unexpected economic shocks, and it tends to be in the form of short-term, high-interest loans (Duong and Izumida, 2002). The 1992 survey does not contain information on whether or not loans were obtained for consumption. The loans from formal credit sources, however, were primarily made for agricultural-investment purposes, and the 1997 data confirm that a greater proportion of the informal borrowers used the credit for consumption purposes (Table 7.7). Given this trend, the impact of informal credit on long-term expenditure growth could be indirect. If higher immediate consumption improves the nutritional status of household members, their labor productivity will increase over time, leading to income growth. Alternatively, consumption stipends from informal sources could allow households to maintain their

Table 7.7 Statistics of Credit Borrowers by Sources, Rural Areas

	1992				1997			
	Private Banks	Government Banks	Informal Credit	All Households	VBP	Formal Credit	Informal Credit	All Households
Number of Households	101	488	1463	3492	215	835	1215	3492
% of poor	66%	50%	63%	57%	55%	36%	42%	40%
PC Expenditures	1431	1622	1407	1506	1703	2075	1927	2016
Growth Rates	9.6%	4.4%	5.6%	5.4%	4.6%	5.0%	5.3%	5.2%
HH in Agriculture	86.1%	94.7%	88.1%	64.%	70.2%	64.5%	59.9%	60.9%
Collateralized loan	5.0%	56.4%	2.1%	--	47%	78.8%	10.2%	--
Loan Size	970	1103	1182	--	1829	4452	3710	--
(Std. dev)	(1406)	(2286)	(3116)		(1504)	(6253)	(8527)	
Loan Purpose								
Agricultural inv.	35.6%	80.5%	35.7%	--	62.8%	74.5%	42.9%	--
Non-agri. inv.	17.8%	7.0%	14.1%	--	11.1%	11.7%	13.1%	--
Consumption	--	--	--	--	7.0%	4.3%	24.6%	--

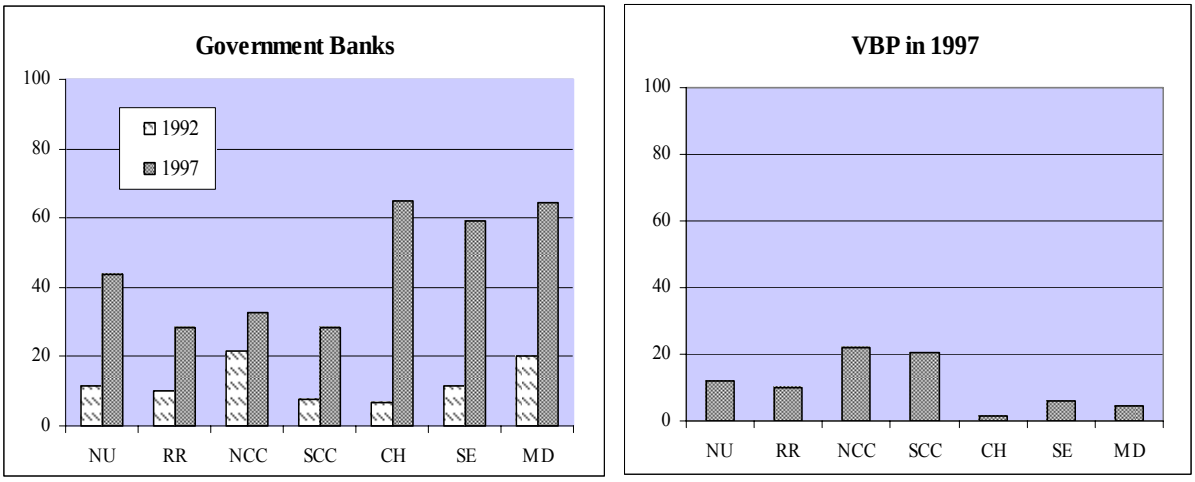
Note: Expenditures and Loan size are in thousands of 1998 Vietnamese dong.
Formal Credit in 1997 includes loans from private banks and from government banks other than VBP.

level of investment for economic activities. Since formal and informal credit affect household decisions differently, I will distinguish between credit sources in evaluating the impact of credit on household expenditure growth.

Before I address the questions of whether the expansion of government banks and the presence of informal credit sources have helped rural households improve their welfare, I first study characteristics of the households obtaining different types of credit. The descriptive statistics in Table 7.7 show a dramatic increase in the number of formal borrowers between 1992 and 1997. In 1992, households with loans from government banks were wealthier than other borrowers, while informal borrowers had significantly lower expenditure levels than the national median. This supports Dat's supposition that poor people borrowed more frequently from informal credit sources in the early 1990s. Surprisingly, a small number of households borrowing from private banks had a lower median expenditure in 1992 than the national median, and the median growth rate is substantially higher. However, it is impossible to track the expansion of commercial loans because very few rural households had credit from private banks in 1997 (0.16 % of all rural households).

Similarly to the pattern in 1992, income levels in 1997 differed significantly across households with credit from different sources. Although the number of borrowers was still limited, loans from the VBP seem to reach the poorer households; the median expenditure level of VBP borrowers was 1,703,000 dong, as opposed to the national median of 2,016,000 dong. The average loan size was small relative to that of other credit sources, and less than half of the loans were collateralized—characteristics commonly found in micro-lending schemes. In contrast, loans from other formal

Figure 7.1 Distribution of Credit by Region



Note: "Government banks" in 1997 excludes three observations that obtained credit from private banks. The y-axis shows the percentage of households that have loans from government banks/VBPs.

institutions (99% of which were government banks) operated more like regular commercial loans, being larger and generally collateralized. Figure 7.1 shows the distribution of government and VBP loans by region. The increase in loans from government banks is concentrated in the South, while the VBP is more accessible in the North. Since the headcount poverty rate is higher and the region is less developed in the North, the VBP's expansion in these regions may be a sign of their successful targeting of the poor.

With regard to the impact of credit on household welfare, simple means do not suggest a positive correlation between gaining access to credit and expenditure growth (Table 7.8). I test the statistical significance of the impact of access to credit by regressing expenditure growth on credit access using both a differenced OLS estimator (equation 6.4) and a 2SLS estimator (equation 6.5'). The household's decision to borrow from certain types of credit institutions depends on financial necessity as well as the availability of credit. Demand-side variables, such as non-farm employment opportunities and the household's farm activities, are also endogenous to household

Table 7.8 Gaining Access to Credit

	Gained access to Formal Credit	Informal Credit	VBP	All Rural
Observations	596	568	215	3492
Poor households	312	304	156	1993
Household expenditures	1559	1572	1268	1506
Growth rates	5.7%	5.2%	4.6%	5.8%

Household expenditure is measured in thousands of Vietnamese dong. Household expenditures and growth rates (annual household expenditure growth rate) are both in median.

expenditures. Thus, I will use a supply-side variable, a dummy variable for the presence of certain credit institutions (VBP, other government banks, and informal sources), to predict whether or not a household has access to credit. Ideally, I would use a lagged version of this variable, because it would have less chance of affecting the growth in household expenditures directly. Unfortunately, the 1992 survey does not have information on credit institutions in communes. As an alternative, I use the presence of credit institutions in 1997 to instrument the changes in loan size between 1992 and 1997. The first stage regressions show that the instruments are insignificant in predicting changes in loan size themselves, but are significant predictors of changes in the ratio of loan size to total household expenditures[9].

The estimated coefficients for the effect of credit on annual household expenditure growth are reported in Table 7.9. All regressions control for the initial household conditions: household demographics, land holdings and other assets, characteristics of household heads, human capital, and regions. Credit variables in model (1) are measured by loan size in 1992 in millions of dongs. Note that the OLS regressions only identify correlation; the causal relation can be determined only in the

[9] See Appendix B2.7 for the first stage results

Table 7.9 Coefficients on Access to Credit

	All households		Poor	
(1) Using 1992 variables				
Private banks	0.0003	(0.005)	0.0179	(0.009)*
Government banks	-0.0013	(0.001)	-0.0013	(0.006)
Informal Credit	-0.0008	(0.001)	0.0034	(0.001)**
(2) Using change between 1992 and 1997 (OLS)				
Formal Credit	0.0012	(0.000)**	0.0043	(0.001)***
VBP	-0.0002	(0.002)	-0.0006	(0.003)
Informal Credit	0.0005	(0.000)*	0.0011	(0.001)***
(3) Using change in the ratio of loan size to HH expenditure between 1992 and 1997				
Formal Credit				
OLS	-0.0197	(0.006)***	-0.0006	(0.008)
2SLS	-0.1750	(0.109)	0.1565	(0.093)*
VBP				
OLS	-0.0423	(0.018)**	-0.0441	(0.019)**
2SLS	0.3324	(0.308)	-0.6880	(0.402)*
Informal Credit				
OLS	-0.0175	(0.004)***	-0.0263	(0.006)***
2SLS	0.0322	(0.049)	0.1641	(0.119)

Note: All loan sizes are in millions of Vietnamese dongs adjusted to 1998 prices. (1) Coefficients for loan sizes from certain types of credit institutions. (2) Coefficients for the change in loan sizes. Formal loan includes credit from private banks and government banks other than VBP. (3) Coefficients for the change in the ratio of loan size to total household expenditures between 1992 and 1997. Dependent variable is annual household per capita expenditure growth for all regression. Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

2SLS estimator. Although the variable for loanw from private banks has a positive, statistically significant coefficient, it does not follow that loans from private banks help households in increasing their consumption levels because those coefficients for private banks could be affected by unobserved heterogeneity. For example, if households with credit from private banks have an intrinsically different attitude toward improving their welfare (i.e. they are more active in searching for the ways to improve their well-being), the coefficients for private banks may be reflecting the significance of the household's positive attitude, rather than the impact of credit itself. Private banks could be also selective in providing loans only to productive households. If these households are not distinguishable from other households in the survey, again, unobserved heterogeneity

would bias the results. Thus, even though there seems to be a positive correlation between credit from private banks and expenditure growth, the direct impact of credit on expenditure growth is unclear from these regression results because the absence of borrowers from private banks in 1997 prevents me from confirming the direction of causality.

Model (2) eliminates the problem of unobserved heterogeneity by using changes in loan size between the two study periods. Instead of comparing households with and without credit, this second set of regressions tests the impact of changes in credit status on changes in expenditures of the same household. The results for these regressions show strong correlation between the change in formal loan size and annual growth rates of household per capita expenditures. However, the magnitude of the impact is small: 1 million dong of formal credit (roughly $75) is associated with 0.12 and 0.43 percentage-point higher annual growth rates among all rural and rural poor households, respectively. Although informal credit also appears to have a positive correlation with expenditure growth, the magnitude of the impact is marginal.

While the regressions in model (2) control for unobserved heterogeneity, the results illustrate only a correlation between credit and expenditure growth and are still subject to potential omitted variable bias and reverse causality. Because the commune-level instruments are not significant predictors of changes in loan sizes, I cannot analyze the true causal relationship with this specific credit variable. In order to eliminate these potential biases, I use another credit variable—the change in the ratio of loan size to total household expenditure. This variable measures how important credit becomes over time relative to household income levels. I report both OLS and 2SLS results in Table 7.8 (3).

The coefficient on formal credit among the poor in the 2SLS model is positive and statistically significant, while the coefficient on informal credit is insignificant. The positive coefficient on formal credit among the poor suggests that poor households that gain better access to credit—measured by the proportion of credit in household expenditures—seem to grow faster than other households. In contrast, the 2SLS coefficient on the VBP is negative and significant, indicating that borrowers from the VBP are poorer than the others. Because the VBP started operating only a year before the second survey was conducted, the coefficients identify the expenditure level of borrowers from VBP credit rather than the impact of VBP credit on household expenditure growth; one year is not a sufficient time period to capture the true impact of improved credit access. The result is a strong indication that the VBP effectively targets the poor—credit is reaching the "losers," whose wellbeing could even exacerbate without VBP credit.

These regression results suggest a strong correlation between gaining formal credit and faster household expenditure growth between 1992 and 1997; however, the direct impact of credit on household expenditure growth is less clear. Although formal credit access, when measured with the ratio of formal loans to household expenditures, has a positive and weakly significant impact on expenditure growth, more analyses—and perhaps better instruments—are needed to confirm a statistically significant impact of

Table 7.10 Starting Business and Staying in Agriculture between 1992 and 1997

	All households		Poor	
Credit status in 1992	Business	Agriculture	Business	Agriculture
No credit	11.6% (5.8)	47.2% (6.0)	8.6% (7.2)	50.4% (7.6)
Any Credit	11.6% (6.3)	47.1% (5.0)	10.0% (10.1)	49.8% (7.3)
Informal Credit	11.6% (6.1)	46.8% (4.8)	9.8% (10.0)	49.7% (7.1)
Formal Credit	11.8% (8.9)	52.6% (10.4)	13.7% (10.1)	52.9% (11.4)

Numbers in parentheses are median growth rates in percentage between 1992 and 1997.

formal credit. If credit helps rural households diversify their economic activities, expanding access to credit may affect household welfare more significantly over a longer span of time. The weak results between 1992 and 1997 do not suggest that the role of formal and informal credit in the post-1997 development was insignificant. The five-year period between the two surveys may simply be not long enough to capture the impact of credit access if the household utilizes the credit for long-term investment. The regressions do not reflect the household decision of how to allocate the credit. Table 7.7 showed that the loans from the formal credit market were dominated by agricultural use. While agricultural investment is the key to enhancing productivity on a farm, and could therefore improve the welfare of rural households, the regressions in section 7.1 also showed that leaving the agricultural sector is associated with a significant increase in expenditure levels. To compare the impact of credit on agricultural and non-agricultural activities, I summarized the relationship between initial credit status in 1992 and changes in occupation in Table 7.10. In comparison to the poor households without credit, a larger proportion of poor households with credit started business between 1992 and 1997. Median growth rates are higher for households with credit in all categories; however, this result may be due to unobserved heterogeneity, as explained earlier. More importantly, among the households with credit, starting a business seems to be associated with higher growth rates than staying in agriculture (row 2). Among the poor, the median annual growth rate is nearly 3 percent higher for households that started business than it is for those that stayed in agriculture (row 2, columns 3 and 4). Thus, the analysis of the impact of credit from different sources leaves open the question of whether or not a

household with credit improves its welfare compared to those that are in the same occupation but lack credit.

One of the most significant constraints that the poor households must overcome to escape poverty is the financial constraint on consumption and investment. The financial sector in Vietnam just started developing in the early 1990s, and the Vietnamese government has successfully expanded financial services in rural areas in the past decade. The establishment of the VBP has improved credit accessibility, particularly among the poor. However, the direct impact of credit on the expenditure levels is difficult to measure. Although there is a correlation between formal credit and expenditure growth between 1992 and 1997, the impact does not seem to be strong and cannot be identified econometrically. While there is a large body of work on changes in household welfare in Vietnam in the 1990s, little has been written about the credit market, particularly about the impact of expanding credit availability. Further research is needed to determine the impact of credit in rural Vietnam. The question of how credit affects household decisions to participate in non-farm economic activities may have important implication for whether or not the government should direct the credit to production uses as it does now.

7.3 Migration

In the regression analysis on the change in loan size, I could only identify a correlation between credit availability and household consumption growth. The expansion of rural credit was not sufficient, at least in 1997, to explain the rapid growth in rural Vietnam. The poor households might succeed in improving their welfare by

investing their limited resources in non-farm economic activities. A study on non-farm employment by Vijverberg (1998) has found a positive impact of family enterprises on the household welfare. However, starting a business generally requires a substantial amount of capital. Migration is another economic activity that can lead to the accumulation of capital by rural households, particularly in the absence of credit markets.

In perhaps the best known model of migration in development, Lewis (1954) hypothesized that an excess labor supply exists in rural areas of developing countries. He therefore believed that out-migration would increase the average product of labor, leading to higher shadow wages as workers were drawn into cities. In support of this hypothesis, one study on the US migration trend in the 1960s found a positive correlation between the rate of farming population loss due to migration and the growth of income for agricultural households in rural areas (Gardner cited by Taylor and Martin, 2001). However, the Lewis model is based on an uncomfortable assumption that marginal product of rural labor on the farm is exactly zero, implying that rural households act rationally—migrating into cities—as there must be activities in which they could receive more utility than in farming. The supposition of excess labor in rural areas of developing countries is debatable, as hired-laborers are generally paid positive wages in rural areas.

Harris and Todaro (1970) suggested that labor mobility is determined by employment rate and wage differentials between cities and villages. In theory, workers keep moving to high-wage and low-unemployment locations until a wage-equilibrium between high and low wage areas is reached, and such an outcome is economically efficient; thus, as transportation costs and information asymmetry diminish in developing countries, a large proportion of the rural population migrates to urban areas. In reality,

however, wage differentials explain only a part of the phenomenon. In fact, rural-urban migration is also driven by economic circumstances that surround specific households. Stark (1991) suggested that migration is an important option for the rural poor to alleviate economic constraints such as the unavailability of credit. The positive impact of migration on the households left behind may not be the increasing marginal product of labor as Lewis had suggested, but the easing financial constraints of rural households due to migrants' earnings, or remittances (Rozelle et al., 2003).

The individual's decision to migrate depends on the expected returns to and the cost of migration; one will migrate only if $p \times w > c$, where p is the probability of finding a job at a destination, w is the wage, and c is the total cost of migration. Because labor markets are segmented for skilled and unskilled workers in most economies, p and w vary across individuals. Furthermore, the probability of finding a job, p, is often a function of several factors that vary at the commune level—p may be higher for villages with a history of migration, while it could be low for villages where few people have left for work. However, the rural poor often do not realize their p because of the information asymmetry. Even though wages for skilled workers in urban areas are high, employment opportunities for unskilled workers are much smaller than for the skilled. While sending a migrant could be costly to the household left behind and the prospects of an unskilled migrant may also be bleak, the rural poor consider migration as a means to escape poverty, or at least relieve the constraints on the household.

In Vietnam, the labor mobility has increased tenfold over the 1990s, and roughly 10.5% of rural households had at least one seasonal migrant in 1997. In analyzing the impact of migrants on rural households in Vietnam, I have two specific questions in

mind: First, do seasonal migrants help rural households in short-term? Second, do seasonal migrants affect the households similarly across different population groups? I define seasonal migrants as household members who were away for part of the year for employment reasons during the twelve months prior to the survey. They may leave their households during the harvest season, when the demand for laborers on large farms increases. Some rural workers find off-farm employment, away from their home villages, between the harvest and the next planting season. These seasonal migrants are quite likely to bring their income home, so their impact on household welfare should be directly reflected in consumption levels. Note that studying only seasonal migrants could yield biased results if there was an association between households with seasonal migrants and permanent migrants[10], because the regressions would omit long-term migrants. However, the correlation between the change in the number of seasonal migrants and whether or not the household sends out at least one long-term migrant between 1992 and 1997 is only -0.04. Thus, I can test for an impact of seasonal migrants on household expenditures independent of the presence of other types of migrants in the households.

The number of seasonal migrants has significantly increased between 1992 and 1997 (Table 7.11). Households that sent out migrants had a slightly lower expenditure level than the national median. More importantly, there was a large variance in the number of households with migrants between geographic characteristics. A large portion

[10] A household member is defined as a permanent migrant if he/she was present in the 1992 survey but was absent in the 1997 survey for employment reasons. In this study I only consider seasonal migrants because of the difficulty of identifying long-term migrants. Long-term migrants generally affect the welfare of rural households by sending remittances. However, the information on long-term migrants does not match well with the information on remittances in my sample; only 22% of the households which reported that at least one of the household members was absent due to employment reasons receive remittances.

of households with migrants were concentrated in the geographies that tend to be richer and have better access to transportation. Over 20% of households in coastal areas and hills/midlands had at least one seasonal migrant in 1997 (rows 4 and 6). In contrast, high mountainous areas had few migrants (2.4 % of rural households). The lack of mobility in high mountainous areas is likely due to the underdeveloped transportation and limited off-farm employment opportunities. Turning now to the migrant's destinations, the two most popular places for seasonal migrants to work were the two largest cities in Vietnam, which have been the engine of the nation's rapid economic growth; over one third of seasonal migrants go to either Ho Chi Minh City (20%) or to Hanoi (13.5%). Households with migrants who go to these two cities are poorer, but are concentrated again in coastal areas, inland deltas, and midlands. Furthermore, households with migrants to Hanoi and Ho Chi Minh City seem to do better (row 3, columns 5 and 6). Thus, the average household with migrants can be characterized as a relatively poor household that reside in more developed areas. Geographic location and destinations seem to be an important determinant of migration contribution to household welfare.

In testing the statistical significance of the impact of migration on expenditure

Table 7.11 Characteristics of Households with Migrants in 1992 and 1997

	Rural Median		HH with migrants		HH with migrants to	
	pcexp 92	Growth	1992	1997	Hanoi	Ho Chi Minh City
Number of observations			65	369	66	73
Median household pcexp	1506	--	1264	1437	1400	1311.5
Median Growth Rates (%)	--	5.8	7.3	5.9	7.2	8.5
Commune Geography (%)						
Coastal	1412	6.3	5.3	21.3	0.0	33.9
Inland Delta	1635	5.8	2.1	11.2	16.8	16.4
Hills/Midlands	1531	7.9	0.5	24.2	50.0	12.5
Low Mountains	1313	5.3	1.3	5.6	11.8	11.8
High Mountains	1291	4.4	0.2	2.4	0.0	9.1

Note: Pcexp is household per capita expenditures in thousands of 1998 dong. Rows (3) and (4) show proportions of rural households with seasonal migrants, and rows (4) and (5) show the proportion of migrants going to Hanoi and Ho Chi Minh City in each geographic category.

growth, I particularly focus on the differences in geographical characteristics and income levels. As discussed in the previous section, however, household's decision to send out a migrant may be affected by its expenditure level. To prevent potential endogeneity from affecting the outcome, I predict the change in the number of migrants between 1992 and 1997 using commune characteristics. If the household has commune acquaintances already working in other villages, it would be easier for a member of that household to find a similar job than those who have no connection because of the support and better information obtained from the acquaintances. Based on this idea, I construct an instrument, a "migration network" variable, by taking the proportion of the working-age population that works in other communes in 1992 to predict the change in the number of migrants in the household between the two surveys. This variable has commonly been used in the migration literature (Taylor and Martin, 2001), and the instrument turns out to be strongly significant in determining the number of migrants.[11]

Using migration network as an instrument, I test the significance of seasonal migration on expenditure growth with the 2SLS simultaneous and sequential models (equation 6.5 and 6.5', respectively), as well as the OLS estimator. The coefficients on the number of changes in migrants are summarized in Table 7.12. The models (1), (2),

Table 7.12 Coefficients for the Changes in the Number of Migrants

Change in # of migrants	All Households		Poor		Non-poor	
(1) OLS	0.0015	(0.003)	0.0000	(0.003)	0.0002	(0.005)
(2) 2SLS (simultaneous)	0.0483	(0.022)**	0.0371	(0.027)	0.0929	(0.032)***
(3) 2SLS (sequential)	0.1601	(0.059)***	0.0343	(0.072)	0.2046	(0.089)**
(4) 2SLS (sequential)	0.0301	(0.022)	0.0062	(0.028)	0.1015	(0.032)***
Ho Chi Minh City	0.0964	(0.043)**	0.0618	(0.048)	0.0635	(0.072)
Hanoi	0.0602	(0.027)**	0.1005	(0.033)***	0.0021	(0.039)

Notes: Dependent variables for (1), (2), and (4) are household per capita expenditures. Dependent variable for (3) 2SLS* is the difference in the logarithm of household per capita expenditures between 1992 and 1997. (4) The second stage is run, using additional explanatory variables: interaction terms for migrants going to Ho Chi Minh City and Hanoi. Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

[11] See Appendix B3.1 for the first stage regression and complete results of other regressions.

and (4) use household characteristics in 1992 as explanatory variables, including demographic composition, land assets, schooling, regions, and primary occupations. These variables control for the initial socio-economic condition of the household. The model (3) is the pure form of a panel data regression, $\Delta \ln y_{it} = \beta \Delta x_{it} + \Delta u_{it}$ (equation 6.4). It only controls for the changes in exogenous variables between the two years, including the changes in commune characteristics and household demographic composition. Note that the dependent variable for this model is the difference in logarithm of household per capita expenditures, rather than the annual growth rate used in other models. In order to compare the coefficients across different models, I need to divide the coefficients by the number of years between the two surveys. Thus, given that the average interval between the two surveys was five years, the impact of migration on the annual expenditure growth rates for the model (3) become *0.1601/5 = 0.0320* among all rural households, and *0.2046/5 = 0.0408* among non-poor households—an extra migrant sent out between 1992 and 1997 increases household annual expenditure growth rate by 3.2 percentage points among all rural and 4.1 percentage points among rural poor households (row 3).

The coefficients for the change in the number of migrants are significant in all 2SLS models. The two models (2) and (3) are consistent in showing the significant impacts of the increase in migrants for non-poor households as well (column 3). On average, having an extra seasonal migrant from the household seems to increase the annual expenditure growth rate by 3 to 5% in rural areas. The impact is greater among the non-poor than among all rural households, and the significance disappears for the poor households. These results suggest that seasonal migration improves household welfare for higher socioeconomic groups. This leads me to compare the characteristics of

Table 7.13 Characteristics of Migrants in 1997

Migrants	Male migrants	Age	Education (yrs) 1992*	Education (yrs) 1997*	Household Size*	Formal Credit	Informal Credit
Non-poor migrants	70.0%	29.4	7.1	7.5	4.9	39.8%	42.1%
Poor migrants	71.1%	30.1	5.9	6.3	5.7	36.9%	41.5%
Total	70.7%	29.9	6.3	6.7	5.4	37.9%	41.7%

* Difference in the means is significant at 1 %.

migrants and households left behind between non-poor households and poor households (Table 7.13). The only noticeable differences are in household size and education level. Not surprisingly, the average years of education attainment for the poor migrants is lower than for non-poor migrants. Thus, the difference in the effect of migration between poor and non-poor households is partly explained by the skill-effects of migrants.

In descriptive statistics, I also identified the concentration of migrants in Hanoi and Ho Chi Minh City. Regression (4) includes the interaction terms for these two locations. The interaction terms for Hanoi and Ho Chi Minh City capture the difference in the impact of migration by destination. In order to add these interaction terms in the second stage regression, I use sequential 2SLS instead of the simultaneous 2SLS model. The change in the number of migrants is first predicted, using the same specification as regression (2). Then the interaction terms are created with this predicted variable. I recognize that this procedure increases the standard errors in the final regressions, and that the significance level may not be as strong as the results indicate. However, the positive coefficients for all specification confirm an association between household expenditure growth and households with migrants who go to Ho Chi Minh City and Hanoi. There is again an interesting difference between poor and non-poor households. While the coefficient of the change in the number of migrants dominates the destination coefficients among non-poor households, the opposite is true for the poor. Particularly,

Table 7.14 Regional Differences in Significance of Migration

	Coeff.		Median expenditures 1992	% of hh with migrants in 97
Regions				
Northern Uplands	0.0827	(0.205)	1288	5.2
Red River Delta	0.1052	(0.042)**	1493	11.4
North Central Coast	0.1020	(0.056)*	1369	16.0
South Central Coast	0.0178	(0.048)	1620	11.0
Central Highlands	-2.8532	(2.020)	1381	1.7
South East	0.1811	(0.105)*	1852	5.1
Mekong Delta	0.1106	(0.066)*	1769	10.9
Geographic characteristics				
Coastal	0.1504	(0.075)**	1412	21.3
Inland delta	0.1101	(0.060)*	1635	11.2
Hill/midlands	0.0508	(0.025)*	1531	24.2
Low mountains	0.0154	(0.096)	1313	5.6
High mountains	-0.6936	(0.155)***	1291	2.4

Regressions for North Central Coast, South Central Coast, Southeast, Mekong Delta, Coastal, Inland delta, and Hill/midlands use simultaneous 2SLS. Other regressions use sequential 2SLS because the instrument was not strong enough to run simultaneous 2SLS in those regions. Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

the interaction term for the migrant in Ho Chi Minh City has a significantly higher coefficient than that of the change in the number of migrants among the poor. Given that the coefficient for migration among the poor was insignificant in simultaneous 2SLS, the results on the interaction terms suggest that for poor households the destination of the migrants affect their prospects more.

Finally, Table 7.14 summarizes the coefficients for each region and for each geographical location separately. Among the regions where the impact of migration is statistically significant, the magnitude of the impact is higher among southern provinces, in the South East and the Mekong Delta. The effect of migration also differs greatly by commune geographic characteristics, as suggested in the earlier descriptive statistics. In coastal areas, inland delta, and hills/midlands, where a large proportion of households with migrants are concentrated, the migration contributes to the increase in household consumption levels. On the contrary, the effect of seasonal migrants in the two less

accessible areas, low mountainous and high mountainous areas, is small or negative. Thus, investing in sending out seasonal migrants appears to result in the improvement of household welfare only in the relatively developed regions of the country.

The analysis in this section established the positive causal impact of seasonal migrants on household per capita expenditure growth. However, the impact of migration is concentrated in richer, better-developed regions and among non-poor households. In richer regions, not only are there more wage-jobs in general, but also a greater number of households hire on-farm laborers, increasing the seasonal employment opportunities for migrants. In addition, wealthier regions have better infrastructure; the more developed the local infrastructure is, the lower the transportation costs for migrants. Most importantly, when controlling for regional and geographic characteristics, the seasonal migration improves the welfare for the non-poor households rather than for the poor. This result may be partly explained by the lower education level, indicating a lack of skills among the poor migrants. Alternatively, the regional and geographic coefficients suggest that migrants from poor households in poor regions such as the Northern Uplands and the Central Highlands are unsuccessful due to geographical constraints. Human mobility in Vietnam increased during the 1990s, and a household's decision to send out migrants came to have important implications for the household's future welfare. However, the benefits from sending out migrants are unequally distributed across the country.

7.4 Who are winners and losers?

So far, I have analyzed the impact of household decisions and characteristics on average growth rate. Now, I will focus on households at the top and the bottom ends of the growth distribution. In section 5, I showed that household per capita growth rates are approximately normally distributed. Using the 25th and 75th percentile of the growth rate distribution at the national-level (including urban areas), I grouped particularly fast-growing and slow/negative-growing households as winners and losers. In this section, I will attempt to explain which household characteristics and decisions lead households to be winners or losers, experiencing either fast or stagnant growth. The significance and magnitude of the impact may be different from the regression results on household per capita expenditures, because the dummy variables for winners and losers only capture the impacts on the top and bottom ends of the growth distribution. I am particularly interested in whether or not seasonal migration—a significant and positive determinant on household expenditure growth on average—also increases the likelihood of becoming a winner.

Table 7.15 shows the descriptive statistics of the winners and losers. There are

Table 7.15 *Winners* and *Losers*, Rural Areas

	All households		Poor households	
	Winners	Losers	Winners	Losers
Proportion of households	22.9	26.3	30.0	15.8
Northern Uplands	17.1	26.5	18.0	21.6
Red River Delta	27.6	19.9	35.9	11.8
North Central Coast	23.8	22.2	28.4	16.0
South Central Coast	20.9	30.5	30.9	20.7
Central Highlands	28.7	24.4	40.0	12.9
South East	38.9	18.2	58.4	1.8
Mekong Delta	14.8	38.7	24.9	16.9
with Migrants	26.6	23.2	33.6	11.7
Median Expenditures, 1992	1213.174	1927.967	1079.405	1299.371

Note: Median Expenditures are in thousands of 1998 dong.

fewer winners and more losers in rural areas than in urban areas when compared to the rural-urban population ratio. However, among the poor, a greater number of rural poor households are categorized as winners than in urban poor. It is important to note that the proportion of winners is higher among poor households than that of the national average. The median expenditure level shows that the winners were significantly poorer than the losers in 1992. This trend is consistent in most of regions except the Northern Uplands, the only area where there are more losers than winners among the poor. In addition to its geographic isolation, the Northern Uplands is also home to nearly 50% of the ethnic minorities in the data set. Earlier regressions showed that ethnic minorities have significantly lower expenditure levels. In contrast to the small number of winners in the Northern Uplands, it is striking that more than half of the poor households in the South East have experienced an annual growth rate above 11.6% between 1992 and 1997. Even in one of the poorest and most remote regions of the country, the Central Highlands, 40% of the poor households have experienced fast-growth. Thus, despite the continuing disparity between regions, the poor households appear to have benefited greatly from economic transition in the 1990s.

Using the Maddala model, a likelihood second-stage estimator, I analyze how significant these regional effects and impacts of other household characteristics were in accelerating or slowing down the household expenditure levels between 1992 and 1997. Tables 7.16 and 7.17 show the summaries of the regression results on winners (fast-growing households) and losers (slow/negative-growing households). First and foremost, the impact of the number of migrants tells an interesting story; sending an extra migrant prevents the household from falling into stagnant growth, although it does not increase

Table 7.16 Selected Coefficients from Probit Regression Results on *winners*, Rural Areas

"Winner"	All households		Poor		Non-poor	
Migration						
Change in # of migrants	0.3119	(0.379)	0.5378	(0.524)	0.305	(0.594)
Had credit in 1992 from						
Private banks	0.3271	(0.141)**	0.4318	(0.174)**	0.013	(0.337)
Government banks	-0.3014	(0.082)***	-0.3492	(0.110)***	0.002	(0.139)
Informal lenders	-0.0422	(0.057)	-0.0765	(0.071)	0.278	(0.116)
Commune characteristic						
New secondary school	0.1625	(0.055)***	0.1543	(0.075)**	0.1401	(0.109)
New agricultural infra.	0.1149	(0.059)**	0.1624	(0.074)**	-0.0471	(0.115)
Factory after 1989	0.0393	(0.065)	0.0939	(0.087)	0.282	(0.116)
Changes in household demographics						
Number of male elderly	0.1251	(0.091)	0.1264	(0.125)	0.313	(0.163)
Number of female elderly	0.1086	(0.075)	0.2315	(0.101)**	0.021	(0.134)
# of females, age 18-55	-0.0151	(0.044)	-0.0341	(0.059)	0.567	(0.082)
# of males, age 18-60	0.1522	(0.047)***	0.1416	(0.066)**	0.031	(0.079)
# of children, age 6-17	0.0227	(0.026)	0.0140	(0.032)	0.666	(0.056)
Gender of the head	-0.0624	(0.070)	0.0011	(0.092)	0.991	(0.128)**
Schooling						
Head's schooling	0.0062	(0.009)	0.0174	(0.012)	0.145	(0.016)**
Other members' schooling	0.0113	(0.009)	0.0037	(0.012)	0.761	(0.017)***
Regions (0=NU)						
Red River Delta	0.2200	(0.099)**	0.3024	(0.129)**	0.019	(0.199)
North Central Coast	0.2467	(0.107)**	0.3159	(0.138)**	0.022	(0.222)
South Central Coast	0.0189	(0.113)	0.2558	(0.148)*	0.084	(0.219)
Central Highlands	0.2361	(0.179)	0.3775	(0.226)*	0.095	(0.395)
South East	0.6665	(0.129)***	0.9741	(0.183)***	0.606	(0.230)***
Mekong Delta	-0.1657	(0.113)	-0.0556	(0.150)	0.280	(0.212)

Note: Regressions control for changes in commune characteristics, household characteristics, pre-1992 occupation of the household head, ethnicity, and land and material assets in 1992. Dependent variable "winner" = 1 if the household annual per capita expenditure is greater than 11.6%, 0 = otherwise, "loser" = 1 if the household annual per capita expenditure is less than 0.8 %, 0 = otherwise. Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

the household's likelihood of being a winner (row 1). However, the impact is insignificant among the poor. This result implies that seasonal migration is a strategy for relatively less poor households to overcome some economic hardship, rather than a strategy to help household growth take off. In the regressions, I included the credit status in 1992 as a control variable. Because of the probable endogeneity between the credit status and unobservable characteristics, I cannot determine the causality with the expenditure growth. However, consistent with the results in section 7.2, there seems to

Table 7.17 Selected Coefficients from Probit Regression Results on *losers*, Rural Areas

"Loser"	All households		Poor		Non-poor	
Migration						
Change in # of migrants	-1.2709	(0.461)***	-1.1332	(0.772)	-1.9073	(0.597)***
Had credit in 1992 from						
Private banks	-0.0713	(0.168)	-0.5688	(0.316)*	0.3766	(0.273)
Government banks	0.1482	(0.079)*	0.0603	(0.128)	0.1078	(0.117)
Informal lenders	-0.0011	(0.059)	-0.0100	(0.085)	0.0792	(0.100)
Commune characteristic						
New secondary school	-0.0223	(0.058)	0.0102	(0.096)	-0.0269	(0.094)
New agricultural infra.	0.0572	(0.062)	-0.0329	(0.092)	0.2106	(0.101)**
Factory after 1989	-0.1267	(0.068)*	-0.0329	(0.114)	-0.1563	(0.102)
Changes in household demographics						
Number of male elderly	-0.0826	(0.097)	-0.0956	(0.162)	0.0362	(0.146)
Number of female elderly	-0.0287	(0.082)	-0.1292	(0.128)	0.1521	(0.125)
# of females, age 18-55	-0.0664	(0.047)	-0.1008	(0.076)	0.0432	(0.074)
# of males, age 18-60	-0.2129	(0.051)***	-0.2039	(0.088)**	-0.1170	(0.072)
# of children, age 6-17	-0.1192	(0.028)***	-0.1234	(0.038)***	-0.0371	(0.050)
Gender of the head	0.0427	(0.074)	0.0044	(0.112)	0.1522	(0.117)
Schooling						
Head's schooling	-0.0100	(0.009)	-0.0161	(0.015)	-0.0363	(0.015)**
Other members' schooling	0.0081	(0.009)	-0.0149	(0.015)	0.0037	(0.015)
Regions (0=NU)						
Red River Delta	-0.0392	(0.104)	-0.0638	(0.150)	0.0146	(0.190)
North Central Coast	0.0588	(0.112)	0.1774	(0.155)	0.1261	(0.208)
South Central Coast	0.3203	(0.117)***	0.1763	(0.173)	0.2380	(0.205)
Central Highlands	-0.2219	(0.189)	-0.6098	(0.281)**	-0.2692	(0.331)
South East	-0.2066	(0.145)	-1.0548	(0.343)***	-0.3298	(0.224)
Mekong Delta	0.5844	(0.113)***	0.2747	(0.174)	0.5829	(0.192)***

Note: Standard deviations are in parentheses. Significance levels; *at 10%, **at 5%, and *** at 1%.

be a positive correlation between households that took out loans from private banks in 1992 and fast growth in the following five years, assuming that the bias is not significant.

Coefficients on household demographic composition variables show that the number of working-aged males is significant both in increasing the probability of winning and in decreasing that of losing (row 11), which is also consistent with its impact on household expenditure levels (Table 7.2). The number of children between 6 and 17 is another significant variable which reduces the probability of experiencing stagnant expenditure growth. The coefficients are significant only for the bottom quartile because fast-growing households may keep their children in school longer, while households with

little expenditure growth, particularly among the poor, would be desperate for additional earnings that children could make. The significance of demographic composition disappears among the non-poor households. Because a smaller proportion of non-poor households (50.5%) were involved in agricultural production in 1997, the demographic composition may be becoming less important for them.

Among non-poor households, education attainment, rather than demographic composition, is a strong and significant factor in accelerating growth rate (rows 14 and 15). Educational attainment was less important among the poor than among those of median income in the earlier regressions (section 7.1), and I suggested that the level of schooling matters less in the agricultural sector. Although years of schooling were still significant in determining expenditure levels both in 1992 and 1997, they did not significantly contribute to pushing the initially poor households up to the top quintile of the growth distribution in five years, as the coefficients for all rural households are insignificant.

In addition to household characteristics, commune environment also seems to affect household economic performance. Commune investment in secondary schools and agricultural infrastructure significantly increase the probability that the households will be categorized as winners. Investment in agriculture may have positive impact on expenditure growth by increasing the agricultural productivity. When investment occurs at the commune level resources are generally larger and there is more knowledge about enhancing agricultural productivity than when poor, less informed individuals make decisions by themselves. Thus, the commune investment in agriculture may be more efficient in enhancing productivity, particularly for the poor communes. The last

commune variable is the presence of factories in the commune (row 7). In the regression on losers, I find that the presence of factories built after 1989 prevents households from falling into the stagnant growth rate category. This variable reflects the off-farm employment opportunities within the commune. Since rural farming households are often exposed to the risk of various economic shocks, such as natural disasters and crop failure, the expansion of off-farm employment could offer some security, particularly for the poor households.

Finally, the regional coefficients confirm the advantage of living in the South East. For all population groups, households in the South East have a much greater probability of winning, or experiencing annual growth rates above 11.6%. Among the poor, all the regions, except the Mekong Delta, have significantly higher probabilities of winning than those in the Northern Uplands. The Mekong Delta has positive and significant coefficients in increasing the likelihood of losing. These results on the Mekong Delta are hard to generalize as a trend over five years because they were likely affected by the severe typhoon of 1997 in this region (Benjamin and Brandt, 2001).

Analyzing the likelihood of experiencing exceptionally high or low growth rates is useful because some determinants of household expenditure growth may have a particularly strong impact on either accelerating household expenditure growth or preventing a slow down of growth. I find that commune investment in agriculture and secondary schools significantly increases the likelihood of households in the commune growing rapidly especially among the poor households. I also find that the impact of seasonal migrants among the non-poor households only prevents households from falling behind, rather than accelerating expenditure growth to the top 25th percentile. In other

words, the household's decision to send out seasonal migrants is made when households are facing some economic or financial difficulty in improving household welfare. Temporary employment opportunities available for seasonal migrants are generally high-paid or skilled jobs. Thus, migration may work as an effective means to overcome the economic hardship for the non-poor households when they need immediate income.

8. CONCLUSION

Vietnam's economic transition since the mid-1980s has dramatically improved household welfare. Between 1992 and 1997, the median household per capita expenditures increased by 36%, and the annual household growth rate in the country remained above 5% in the late 1990s. Using the two sets of VLSS data, this study has investigated changes in poverty and inequality and the distribution of the benefits of economic transition, particularly focusing on the impact of credit extension and seasonal migration in rural areas. A summary of the findings is as follows:

- Between 1992 and 1997, headcount poverty dramatically decreased. However, poverty reduction was much more successful in urban than rural areas. Particularly, food poverty, or extreme poverty, is over ten times more prevalent in rural than urban areas.
- Inequality measured by Gini coefficients has slightly increased at the national level, as well as at the rural-urban and inter-regional levels. Rural areas in the South East have grown particularly fast, while the Northern Uplands are falling behind.
- Leaving the agricultural sector increases the average household welfare in rural areas; poor households whose heads are in a high-skilled job or sales industry have an increasing advantage in achieving higher consumption levels over other poor households.
- The expansion of the VBA and the VBP has made credit more accessible to poor households. However, credit from government banks flowing into the agricultural sector does not have a significant impact on expenditure growth

during the study period. On the other hand, commune-level agricultural investment improves the welfare of poor households.

- Finally, and most significantly, seasonal migration has a positive, causal impact on expenditure growth. Particularly, it prevents households from experiencing stagnant growth. The impact, however, is not significant among poor households and in poor regions.

This study leaves an important question about credit access for future research. I could not identify a strong, direct impact of government loans on expenditure growth, at least between 1992 and 1997. Credit availability is in the arena of direct intervention for the government—restricting, directing, or liberalizing financial flows. The Vietnamese government set up the VBP in 1996 to improve the financial flow to the rural poor, whose credit constraints may have hindered them from benefiting fully from the nation's rapid economic development. Measuring the impact of VBP credit may require more time, since the VBP had just started its operation at the time of the second survey.

On the other hand, the VBA has established the lending mechanism for rural households in collaboration with mass credit organizations in the early 1990s, however, no significant impact was found. If this is the case, there needs to be other complementary policies to induce the efficient allocation of credit. Recent innovation in microfinance offers one potential solution: health education, insurance, and business training packaged with credit. Poor or uninformed households often lack the ability to make efficient investment; financial resources effectively enhance the productivity only if the credit is invested in efficient ways. Thus, programs for education and job training may help rural households make efficient investment decisions.

The regression analysis identified the important role of seasonal migration in rural Vietnam. While there is an increasing volume of literature on household welfare during Vietnam's economic transition, there are few studies that analyze the impacts of domestic migration. My findings suggest that sending out seasonal migrants is an effective way to fend off a deterioration of household welfare. However, high transportation costs and few employment opportunities in poor regions presently confine the potential benefits of migration. Furthermore, migration networks are a strongly significant predictor of migration, which indicates that the networks lower the costs of participating in migration. Then, it is essential for the local and national government to encourage public investment in infrastructure to establish more accessible transportation and better communication in underdeveloped areas.

The distribution of expenditure growth has illustrated a remarkable feature of Vietnam's economic transition: relatively poor households benefited the most. While such an observation reflects the general trend of economic development in Vietnam, a more careful analysis shows that regional disparities and rural-urban inequality have increased during this time. Particularly, the disadvantages in the Northern Uplands due to its geographical characteristics appear to hurt the poor severely. Credit access and migration could potentially encourage economic growth among poor households. However, the integration of remote areas into the economic system of rapidly developing areas through providing better access to information, education, and transportation is indispensable for poor households to make efficient decisions in regard to credit access, migration and other economic behaviors. Thus, in order to achieve further economic,

shared growth, the Vietnamese government should focus its attention on remote areas to prevent further regional divergence.

APPENDIX A: Variable descriptions

Variable names	Variable Description
Changes in household	
# of migrants	Change in the number of seasonal migrants between the two surveys
Change in loan size	Change in the household loan size in millions of dong.
Ratio of loan to exp	Change in the ratio of loan size to the total household expenditure.
HH member's death	1= if at least one household member died between the two surveys
Dlog(hhsize)	Change in the logarithm of household size between the two surveys
Credit	
(1992)	
Private Banks	1=if the household had borrowed from private banks in 1992
Government Banks	1=if the household had borrowed from government banks in 1992
Informal Credit	1=if the household had credit from other sources in 1992
Loan size	Loan size in 1992 in millions of dongs.
(1997)	
Formal Credit	1=if the household had borrowed from government banks or private banks in 1997
VBP	1=if the household had borrowed from VBP in 1997
Informal Credit	1=if the household had credit from other sources in 1997
Commune characteristics	
New sec. school	1=if the commune opened a secondary school between the two surveys
New Agr. Infra.	1=if the commune acquired new agricultural assets between the two surveys
New roads	1=if the commune built new roads between the two surveys
Crop failure	1=if the commune had at least one crop failure that reduced the output by more than 10% between the two surveys
Factory after 1989	1=if the commune had factory which was built after 1989 and employs commune residents
Mig Network	Number of people who left the commune for work/Commune population
Commune Geography	
Coast	1=if the commune is located in coastal areas
Inland delta	1=if the commune is located in inland deltas
Hill/midlands	1=if the commune is located in hills or midlands
Low mountains	1=if the commune is located in low mountainous areas
High mountains	1=if the commune is located in high mountainous areas
Demographic characteristics	
# of male elderly	Number of male elderly above 60 in the household
# of female elderly	Number of female elderly above 55 in the household
# of female, age 18-55	Number of female adults between 18 and 60 in the household
# of male, age 18-60	Number of male adults between 18 and 60 in the household
# of children, 6-17yrs	Number of children between 6 and 17 in the household
HH Age	The age of the household head
(HH Age)Sq	(The age of the household head) squared
Gender	1= if the household head is male
Log(saving)	Logarithm of the stock of savings in 1992
Save	1= if the household had savings in 1992

Variable names	Variable Description
Land and Other Assets	
Log(annual crop land)	Logarithm of the area of annual crop land (m)
Log(perennial crop land)	Logarithm of the area of perennial crop land (m)
Water	1= if the household owns use-rights of water surface
Forest	1=if the household owns forest land
Motorbike	1=if the household owns motorbike
Bicycle	1=if the household owns bicycle
Ethnicity	
(0=Vietnamese Kinh)	
Chinese	1=if the household head is ethnically Chinese
Minorities	1=if the household head is ethnic minority
Employment	
(0=agriculture)	
Skilled labor	1=if the household head's (hh's) primary occupation in the last 12 months is skilled labor
Unskilled labor	1=if the hh's primary occupation in the last 12 months is unskilled labor
Sales	1=if the hh's primary occupation in the last 12 months is in sales
Government jobs	1=if the hh's primary occupation in the last 12 months is in the public sector
Professional work	1=if the hh's primary occupation in the last 12 months is professional work
Other work	1=if the hh's primary occupation in the last 12 months is none of the above
Regions	
(0=Northern Uplands)	
Red River Delta	1=if the household resides in Red River Delta
North Central Coast	1=if the household resides in North Central Coast
South Central Coast	1=if the household resides in South Central Coast
Central Highlands	1=if the household resides in Central Highlands
South East	1=if the household resides in South East
Mekong Delta	1=if the household resides in Mekong Delta

APPENDIX B: Complete Regression Results

Note: Numbers in parentheses are standard deviation. Significance level at ***1%, **5%, *10%.

1. *Section 7.1*

B1.1 Household per capita Expenditures, Rural Areas

	1992	(n=3492)			1997	(n=3389)		
	(1)		(2)		(3)		(4)	
Demographic Composition								
# of male elderly	0.1284	(0.021)***	0.1139	(0.023)***	-0.0006	(0.020)	0.0277	(0.022)
# of female elderly	0.1181	(0.017)***	0.1308	(0.019)***	0.0399	(0.018)**	0.0508	(0.019)***
# of female, age 18-55	0.0703	(0.011)***	0.0871	(0.013)***	0.0039	(0.012)	0.0225	(0.013)*
# of male, age 18-60	0.0891	(0.011)***	0.1042	(0.012)***	0.0205	(0.011)*	0.0429	(0.012)***
# of children, 6-17yrs	0.0026	(0.007)	0.0014	(0.008)	0.0080	(0.008)	0.0109	(0.009)
Log(hh size)	-0.5517	(0.028)***	-0.5241	(0.030)***	-0.0072	(0.001)***	-0.0077	(0.001)***
HH Age	0.0141	(0.003)***	0.0135	(0.003)***	0.0179	(0.003)***	0.0207	(0.004)***
(HH Age)Sq	-0.0001	(0.000)***	-0.0001	(0.000)***	-0.0001	(0.000)***	-0.0001	(0.000)***
Land and Other Assets								
Land area (annual)	0.0144	(0.002)***	0.0063	(0.002)***	0.0022	(0.003)	-0.0058	(0.002)**
Land area (perennial)	0.0036	(0.033)	0.0058	(0.037)	0.0122	(0.003)***	0.0077	(0.002)***
Water	0.0966	(0.017)***	0.0398	(0.017)**	0.0982	(0.043)**	0.0636	(0.045)
Forest	0.0805	(0.024)***	0.0539	(0.022)**	0.0628	(0.032)**	0.0390	(0.031)
Car	0.6112	(0.349)*	0.6535	(0.390)*	0.8475	(0.199)***	0.8994	(0.216)***
Motorbike	0.3747	(0.033)***	0.3645	(0.036)***	0.3637	(0.022)***	0.3879	(0.024)***
Bicycle	0.1045	(0.014)***	0.0973	(0.015)***	0.0639	(0.016)***	0.0557	(0.015)***
Schooling								
HH Schooling	0.0216	(0.002)***	0.0234	(0.002)***	0.0274	(0.002)***	0.0277	(0.002)***
Average Schooling	0.0163	(0.001)***	0.0170	(0.001)***	0.0124	(0.002)***	0.0126	(0.002)***
Ethnicity								
(0=Vietnamese Kinh)								
Chinese	0.0746	(0.100)	0.2133	(0.109)*	0.0450	(0.108)	0.1201	(0.114)
Minorities	-0.1466	(0.030)***	-0.1458	(0.022)***	-0.1631	(0.030)***	-0.2071	(0.022)***
Employment								
(0=agriculture)								
Skilled labor	0.1184	(0.043)***	0.1469	(0.047)***	0.0512	(0.024)**	0.0709	(0.025)***
Unskilled labor	-0.0237	(0.033)	-0.0091	(0.036)	-0.0783	(0.028)***	-0.0711	(0.029)**
Sales	0.2150	(0.082)***	0.3147	(0.091)***	0.1595	(0.029)***	0.1621	(0.031)***
Government jobs	0.1674	(0.156)	0.2199	(0.175)	0.0880	(0.052)*	0.1028	(0.056)*
Professional work	0.1756	(0.037)***	0.1760	(0.041)***	0.1460	(0.043)***	0.1726	(0.046)***
Other work	0.0246	(0.015)*	0.0369	(0.016)**	-0.0190	(0.018)	-0.0137	(0.020)
		R-sq=0.19		R-sq=0.33		R-sq=0.21		R-sq=0.40

(1) and (3) are commune fixed effects, (2) and (4) are region fixed effects.

B1.2 Household per capita Expenditures, Rural Poor

	1992	(n=1992)			1997	(n=1360)		
Fixed Effects	(1)		(2)		(3)		(4)	
Demographic Composition								
# of male elderly	0.0610	(0.021)***	0.0587	(0.022)***	0.0235	(0.020)	0.0322	(0.021)
# of female elderly	0.0639	(0.016)***	0.0721	(0.017)***	0.0598	(0.018)***	0.0817	(0.019)***
# of female, age 18-55	0.0247	(0.011)**	0.0347	(0.012)***	0.0334	(0.013)***	0.0427	(0.013)***
# of male, age 18-60	0.0687	(0.011)***	0.0783	(0.011)***	0.0384	(0.011)***	0.0524	(0.012)***
# of children, 6-17yrs	0.0079	(0.006)	0.0095	(0.007)	0.0286	(0.008)***	0.0329	(0.008)***
Log(hh size)	-0.2877	(0.026)***	-0.2466	(0.028)***	-0.0048	(0.001)***	-0.0048	(0.001)***
HH Age	0.0050	(0.003)*	0.0025	(0.003)	0.0024	(0.004)	0.0024	(0.004)
(HH Age)Sq	-0.0001	(0.000)*	0.0000	(0.000)	0.0000	(0.000)	0.0000	(0.000)
Land and Other Assets								
Land Area (annual)	0.0162	(0.003)***	0.0047	(0.002)**	0.0058	(0.003)*	0.0005	(0.003)
Land Area (perennial)	--		--		0.0088	(0.003)***	0.0056	(0.002)**
Water	0.0353	(0.016)**	0.0079	(0.016)	0.0476	(0.048)	0.0686	(0.049)
Forest	0.0451	(0.021)**	0.0486	(0.019)**	0.0387	(0.026)	0.0285	(0.026)
Car	--		--		--		--	
Motorbike	0.1267	(0.052)**	0.1193	(0.057)**	0.2048	(0.048)***	0.2286	(0.052)***
Bicycle	0.0741	(0.013)***	0.0891	(0.013)***	0.0743	(0.015)***	0.0633	(0.014)***
Schooling								
HH Schooling	0.0106	(0.002)***	0.0124	(0.002)***	0.0141	(0.002)***	0.0131	(0.002)***
Average Schooling	0.0090	(0.001)***	0.0087	(0.001)***	0.0079	(0.003)***	0.0089	(0.002)***
Ethnicity								
(0=Vietnamese Kinh)								
Chinese	-0.1072	(0.128)	-0.0184	(0.134)	-0.0820	(0.113)	0.0381	(0.117)
Minorities	-0.0988	(0.027)***	-0.0999	(0.018)***	-0.0298	(0.028)	-0.0558	(0.018)***
Employment								
(0=agriculture)								
Skilled labor	0.0045	(0.048)	0.0261	(0.052)	0.0464	(0.027)*	0.0636	(0.026)**
Unskilled labor	0.0215	(0.030)	0.0292	(0.032)	-0.0119	(0.026)	0.0120	(0.027)
Sales	-0.0545	(0.125)	0.0131	(0.136)	0.0829	(0.037)**	0.0708	(0.039)*
Government jobs	0.3001	(0.242)	0.3515	(0.268)	0.0480	(0.097)	0.0650	(0.105)
Professional work	0.0548	(0.043)	0.0247	(0.047)	-0.0050	(0.064)	0.0382	(0.069)
Other work	0.0044	(0.014)	0.0161	(0.015)	-0.0306	(0.019)	-0.0056	(0.020)
		R-sq=0.13		R-sq=0.18		R-sq=0.17		R-sq=0.22

(1) and (3) are commune fixed effects, (2) and (4) are region fixed effects.

B1.3 Household per capita Expenditures, Urban Areas

	1992	(n=808)			1997	(n=901)		
Fixed Effects	(1)		(2)		(3)		(4)	
Demographic Composition								
# of male elderly	0.0879	(0.021)*	0.0685	(0.048)	-0.0876	(0.042)**	-0.1064	(0.044)**
# of female elderly	0.1112	(0.044)**	0.1288	(0.046)***	-0.0279	(0.040)	-0.0556	(0.041)
# of female, age 18-55	0.1024	(0.024)***	0.1136	(0.025)***	-0.0571	(0.025)**	-0.0536	(0.026)**
# of male, age 18-60	0.0696	(0.023)***	0.0664	(0.024)***	-0.0562	(0.024)**	-0.0673	(0.025)***
# of children, 6-17yrs	-0.0072	(0.019)	-0.0042	(0.019)	-0.0871	(0.020)***	-0.1062	(0.021)***
Log(hh size)	-0.6472	(0.072)***	-0.6787	(0.075)***	-0.0018	(0.001)	-0.0012	(0.001)
HH Age	0.0045	(0.008)	-0.0007	(0.008)	0.0137	(0.008)*	0.0174	(0.009)**
(HH Age)Sq	0.0000	(0.000)	0.0000	(0.000)	-0.0001	(0.000)	-0.0001	(0.000)
Land and Other Assets								
Land Area (annual)	-0.0062	(0.008)	-0.0063	(0.007)	-0.0161	(0.007)**	-0.0253	(0.007)***
Land Area (perennial)	0.0515	(0.040)	0.0461	(0.042)	0.0089	(0.011)	0.0067	(0.010)
Water	0.2245	(0.082)***	0.2767	(0.086)***	-0.0268	(0.194)	-0.1798	(0.203)
Forest	0.0830	(0.164)	-0.0261	(0.168)	0.0964	(0.303)	0.1063	(0.317)
Car	0.9188	(0.298)***	0.8341	(0.312)***	0.6410	(0.244)***	0.7133	(0.258)***
Motorbike	0.3780	(0.041)***	0.3956	(0.043)***	0.3969	(0.035)***	0.4594	(0.037)***
Bicycle	0.0943	(0.035)***	0.0610	(0.036)*	0.0162	(0.034)	-0.0242	(0.034)
Schooling								
HH Schooling	0.0243	(0.004)***	0.0300	(0.004)***	0.0245	(0.004)***	0.0314	(0.005)***
Average Schooling	0.0143	(0.003)***	0.0152	(0.003)***	0.0156	(0.005)***	0.0144	(0.005)***
Ethnicity								
(0=Vietnamese Kihn)								
Chinese	0.0997	(0.068)	0.2057	(0.062)***	0.0300	(0.068)	0.1227	(0.064)*
Minorities	-0.0586	(0.107)	0.0159	(0.110)	-0.0586	(0.123)	0.0864	(0.127)
Employment								
(0=agriculture)								
Skilled labor	0.0861	(0.076)	0.0392	(0.077)	-0.0321	(0.061)	0.0009	(0.063)
Unskilled labor	0.0588	(0.080)	-0.0144	(0.080)	-0.1902	(0.078)**	-0.2041	(0.082)**
Sales	0.0198	(0.077)	0.0419	(0.078)	0.0307	(0.058)	0.0378	(0.060)
Government jobs	-0.0755	(0.244)	-0.1622	(0.256)	0.0758	(0.098)	0.0700	(0.103)
Professional work	0.2102	(0.059)***	0.1728	(0.061)***	0.0722	(0.070)	0.0760	(0.074)
Other work	0.0442	(0.049)	0.0335	(0.049)	-0.0363	(0.054)	-0.0338	(0.057)
		R-sq=0.36		R-sq=0.46		R-sq=0.40		R-sq=0.45

(1) and (3) are commune fixed effects, (2) and (4) are region fixed effects.

2. *Section 7.2*

B2.1 Model (1) OLS results on growth rate:
Using credit variables in 1992, all rural (N=3396)

	Private Banks		Government Banks		Informal credit	
Credit in 1992						
Loan size	0.0003	(0.005)	-0.0013	(0.001)	-0.0008	(0.001)
Commune characteristics						
New sec. school	0.0058	(0.003)**	0.0059	(0.003)**	0.0058	(0.003)**
New infrastructure	0.0083	(0.005)	0.0083	(0.005)	0.0084	(0.005)
Crop failure	-0.0175	(0.005)***	-0.0174	(0.005)***	-0.0173	(0.005)***
Factory after 1989	0.0080	(0.003)**	0.0080	(0.003)**	0.0081	(0.003)***
Household Characteristics						
HH Age	-0.0019	(0.001)***	-0.0019	(0.001)***	-0.0019	(0.001)***
(HH Age)Sq	0.0000	(0.000)**	0.0000	(0.000)**	0.0000	(0.000)**
Gender	-0.0026	(0.004)	-0.0026	(0.004)	-0.0026	(0.004)
Log(saving)	-0.0022	(0.000)***	-0.0022	(0.000)***	-0.0022	(0.000)***
Dlog(hhsize)	-0.0851	(0.004)***	-0.0850	(0.004)***	-0.0849	(0.004)***
# of male elderly	-0.0089	(0.005)*	-0.0087	(0.005)*	-0.0086	(0.005)*
# of female elderly	-0.0083	(0.004)**	-0.0082	(0.004)**	-0.0083	(0.004)**
# of female, age 18-55	-0.0025	(0.002)	-0.0025	(0.002)	-0.0024	(0.002)
# of male, age 18-60	-0.0085	(0.002)***	-0.0083	(0.002)***	-0.0083	(0.002)***
# of children, 6-17yrs	0.0036	(0.001)***	0.0037	(0.001)***	0.0038	(0.001)***
Land and Other Assets						
Log(annual crop land)	-0.0014	(0.001)***	-0.0014	(0.001)***	-0.0015	(0.001)***
Water	-0.0037	(0.003)	-0.0038	(0.003)	-0.0039	(0.003)
Motorbike	0.0097	(0.007)	0.0097	(0.007)	0.0098	(0.007)
Bicycle	0.0079	(0.003)***	0.0079	(0.003)***	0.0079	(0.003)***
Schooling						
HH Schooling	0.0009	(0.000)*	0.0009	(0.000)*	0.0009	(0.000)**
Average Schooling	-0.0002	(0.000)	-0.0001	(0.000)	-0.0001	(0.000)
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0062	(0.021)	-0.0063	(0.021)	-0.0061	(0.021)
Minorities	-0.0070	(0.004)*	-0.0070	(0.004)*	-0.0072	(0.004)*
Employment (0=agriculture)						
Skilled labor	-0.0167	(0.009)*	-0.0169	(0.009)*	-0.0160	(0.009)*
Unskilled labor	0.0065	(0.007)	0.0064	(0.007)	0.0066	(0.007)
Sales	-0.0114	(0.018)	-0.0115	(0.018)	-0.0121	(0.018)
Government jobs	0.0026	(0.034)	0.0022	(0.034)	0.0028	(0.034)
Professional work	-0.0102	(0.008)	-0.0100	(0.008)	-0.0101	(0.008)
Other work	0.0010	(0.003)	0.0010	(0.003)	0.0010	(0.003)
Regions (0=Northern Uplands)						
Red River Delta	0.0134	(0.005)***	0.0134	(0.005)***	0.0134	(0.005)***
North Central Coast	0.0085	(0.005)*	0.0086	(0.005)	0.0085	(0.005)*
South Central Coast	-0.0071	(0.006)	-0.0071	(0.006)	-0.0072	(0.006)
Central Highlands	0.0115	(0.008)	0.0116	(0.008)	0.0118	(0.008)
South East	0.0312	(0.006)***	0.0317	(0.006)***	0.0312	(0.006)***
Mekong Delta	-0.0224	(0.005)***	-0.0221	(0.005)***	-0.0219	(0.005)***
Constant	0.1209	(0.018)***	0.1203	(0.018)***	0.1207	(0.018)***
	R^2=0.18		R^2=0.18		R^2=0.18	

Note: 98 households that did not live in the communes surveyed are dropped.

B2.2 Model (1) OLS results on growth rate:
Using credit variables in 1992, rural poor (N=1956)

	Private Banks		Government Banks		Informal credit	
Credit in 1992						
Loan size	0.0179	(0.009)*	-0.0013	(0.006)	0.0034	(0.001)**
Commune characteristics						
New secondary school	0.0049	(0.007)	0.0048	(0.007)	0.0047	(0.007)
New infrastructure	-0.0213	(0.007)***	-0.0213	(0.007)***	-0.0225	(0.007)***
Crop failure	0.0063	(0.003)*	0.0060	(0.003)*	0.0058	(0.003)*
Factory after 1989	0.0071	(0.004)*	0.0075	(0.004)*	0.0070	(0.004)*
Household Characteristics						
HH Age	-0.0002	(0.001)	-0.0001	(0.001)	-0.0001	(0.001)
(HH Age)Sq	0.0000	(0.000)	0.0000	(0.000)	0.0000	(0.000)
Gender	-0.0015	(0.005)	-0.0013	(0.005)	-0.0016	(0.005)
Log(saving)	0.0004	(0.001)	0.0003	(0.001)	0.0003	(0.001)
Dlog(hhsize)	-0.0797	(0.005)***	-0.0796	(0.005)***	-0.0797	(0.005)***
# of male elderly	-0.0051	(0.006)	-0.0051	(0.006)	-0.0052	(0.006)
# of female elderly	-0.0076	(0.004)*	-0.0072	(0.004)	-0.0072	(0.004)
# of female, age 18-55	-0.0043	(0.003)	-0.0041	(0.003)	-0.0041	(0.003)
# of male, age 18-60	-0.0116	(0.003)***	-0.0116	(0.003)***	-0.0121	(0.003)***
# of children, 6-17yrs	-0.0015	(0.001)	-0.0015	(0.001)	-0.0018	(0.001)
Land and Other Assets						
Log(annual crop land)	-0.0016	(0.001)**	-0.0016	(0.001)**	-0.0016	(0.001)**
Water	0.0004	(0.004)	0.0003	(0.004)	0.0005	(0.004)
Motorbike	0.0297	(0.015)**	0.0339	(0.015)**	0.0332	(0.015)**
Bicycle	0.0059	(0.003)*	0.0059	(0.003)*	0.0062	(0.003)*
Schooling						
HH Schooling	0.0009	(0.001)	0.0009	(0.001)	0.0009	(0.001)
Average Schooling	0.0005	(0.001)	0.0006	(0.001)	0.0005	(0.001)
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0182	(0.035)	-0.0188	(0.035)	-0.0169	(0.035)
Minorities	-0.0119	(0.005)**	-0.0122	(0.005)***	-0.0112	(0.005)**
Employment (0=agriculture)						
Skilled labor	-0.0264	(0.013)**	-0.0257	(0.013)*	-0.0258	(0.013)*
Unskilled labor	0.0003	(0.008)	-0.0002	(0.008)	-0.0005	(0.008)
Sales	-0.0179	(0.035)	-0.0182	(0.035)	-0.0172	(0.035)
Government jobs	-0.0248	(0.069)	-0.0258	(0.069)	-0.0286	(0.069)
Professional work	0.0034	(0.012)	0.0054	(0.012)	0.0051	(0.012)
Other work	0.0001	(0.004)	-0.0001	(0.004)	-0.0002	(0.004)
Regions (0=Northern Uplands)						
Red River Delta	0.0168	(0.005)***	0.0172	(0.005)***	0.0169	(0.005)***
North Central Coast	0.0085	(0.005)	0.0085	(0.005)	0.0087	(0.005)
South Central Coast	0.0116	(0.007)*	0.0119	(0.007)*	0.0121	(0.007)*
Central Highlands	0.0350	(0.010)***	0.0351	(0.010)***	0.0323	(0.010)***
South East	0.0540	(0.008)***	0.0537	(0.009)***	0.0540	(0.008)***
Mekong Delta	0.0090	(0.006)	0.0094	(0.006)	0.0084	(0.006)
Constant	0.1009	(0.022)***	0.1002	(0.022)***	0.1013	(0.021)***
	R^2=0.18		R^2=0.18		R^2=0.18	

B2.3 Model (2) OLS Regression on expenditure growth, All rural households (N=3396)

	Formal Credit		VBP		Informal Credit	
Change in loan size	0.0012	(0.000)***	-0.0002	(0.002)	0.0005	(0.000)*
Commune characteristics						
New secondary school	0.0059	(0.003)**	0.0058	(0.003)**	0.0057	(0.003)**
New infrastructure	0.0087	(0.005)	0.0083	(0.005)	0.0087	(0.005)
Crop failure	-0.0182	(0.005)***	-0.0175	(0.005)***	-0.0179	(0.005)***
Factory after 1989	0.0078	(0.003)**	0.0080	(0.003)**	0.0081	(0.003)***
Household Characteristics						
HH Age	-0.0019	(0.001)***	-0.0019	(0.001)***	-0.0019	(0.001)***
(HH Age)Sq	0.0000	(0.000)**	0.0000	(0.000)**	0.0000	(0.000)**
Gender	-0.0029	(0.004)	-0.0026	(0.004)	-0.0026	(0.004)
Log(saving)	-0.0022	(0.000)***	-0.0022	(0.000)***	-0.0022	(0.000)***
Dlog(hhsize)	-0.0857	(0.004)***	-0.0851	(0.004)***	-0.0854	(0.004)***
# of male elderly	-0.0089	(0.005)*	-0.0089	(0.005)*	-0.0087	(0.005)*
# of female elderly	-0.0084	(0.004)**	-0.0083	(0.004)**	-0.0083	(0.004)**
# of female, age 18-55	-0.0025	(0.002)	-0.0025	(0.002)	-0.0024	(0.002)
# of male, age 18-60	-0.0086	(0.002)***	-0.0085	(0.002)***	-0.0085	(0.002)***
# of children, 6-17yrs	0.0035	(0.001)***	0.0036	(0.001)***	0.0036	(0.001)***
Land and Other Assets						
Log(annual crop land)	-0.0014	(0.001)***	-0.0014	(0.001)***	-0.0015	(0.001)***
Water	-0.0040	(0.003)	-0.0037	(0.003)	-0.0038	(0.003)
Motorbike	0.0093	(0.007)	0.0097	(0.007)	0.0096	(0.007)
Bicycle	0.0079	(0.003)***	0.0079	(0.003)***	0.0078	(0.003)***
Schooling						
HH Schooling	0.0008	(0.000)*	0.0009	(0.000)*	0.0009	(0.000)*
Average Schooling	-0.0001	(0.000)	-0.0002	(0.000)	-0.0001	(0.000)
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0066	(0.021)	-0.0062	(0.021)	-0.0068	(0.021)
Minorities	-0.0068	(0.004)	-0.0070	(0.004)	-0.0067	(0.004)
Employment (0=agriculture)						
Skilled labor	-0.0168	(0.009)*	-0.0167	(0.009)*	-0.0165	(0.009)*
Unskilled labor	0.0065	(0.007)	0.0065	(0.007)	0.0068	(0.007)
Sales	-0.0103	(0.018)	-0.0114	(0.018)	-0.0120	(0.018)
Government jobs	-0.0024	(0.034)	0.0025	(0.034)	0.0032	(0.034)
Professional work	-0.0110	(0.008)	-0.0101	(0.008)	-0.0102	(0.008)
Other work	0.0008	(0.003)	0.0010	(0.003)	0.0010	(0.003)
Regions (0=Northern Uplands)						
Red River Delta	0.0137	(0.005)***	0.0134	(0.005)***	0.0133	(0.005)***
North Central Coast	0.0088	(0.005)*	0.0085	(0.005)*	0.0083	(0.005)*
South Central Coast	-0.0070	(0.006)	-0.0071	(0.006)	-0.0073	(0.006)
Central Highlands	0.0069	(0.009)	0.0114	(0.008)	0.0095	(0.008)
South East	0.0294	(0.006)***	0.0312	(0.006)***	0.0307	(0.006)***
Mekong Delta	-0.0233	(0.005)***	-0.0224	(0.005)***	-0.0223	(0.005)***
Constant	0.1213	(0.018)***	0.1209	(0.018)***	0.1208	(0.018)***
	R^2=0.18		R^2=0.18		R^2=0.18	

B2.4 Model (2) OLS Regression on expenditure growth, rural poor (N=1956)

	Formal Credit		VBP		Informal Credit	
Change in loan size	0.0043	(0.001)***	-0.0006	(0.002)	0.0011	(0.001)*
Commune characteristics						
New secondary school	0.0062	(0.003) **	0.0059	(0.003)*	0.0059	(0.003)*
New infrastructure	0.0060	(0.006)	0.0047	(0.007)	0.0046	(0.007)
Crop failure	-0.0241	(0.007) ***	-0.0214	(0.007)***	-0.0217	(0.007)***
Factory after 1989	0.0066	(0.004) *	0.0075	(0.004)*	0.0076	(0.004)*
Household Characteristics						
HH Age	0.0000	(0.001)	-0.0001	(0.001)	-0.0001	(0.001)
(HH Age)Sq	0.0000	(0.000)	0.0000	(0.000)	0.0000	(0.000)
Gender	-0.0015	(0.005)	-0.0013	(0.005)	-0.0013	(0.005)
Log(saving)	0.0004	(0.001)	0.0003	(0.001)	0.0003	(0.001)
Dlog(hhsize)	-0.0801	(0.005) ***	-0.0796	(0.005)***	-0.0800	(0.005)***
# of male elderly	-0.0050	(0.006)	-0.0051	(0.006)	-0.0051	(0.006)
# of female elderly	-0.0067	(0.004)	-0.0072	(0.004)*	-0.0072	(0.004)
# of female, age 18-55	-0.0044	(0.003)	-0.0041	(0.003)	-0.0043	(0.003)
# of male, age 18-60	-0.0120	(0.003) ***	-0.0117	(0.003)***	-0.0116	(0.003)***
# of children, 6-17yrs	-0.0021	(0.001) *	-0.0015	(0.001)	-0.0017	(0.001)
Land and Other Assets						
Log(annual crop land)	-0.0014	(0.001) *	-0.0016	(0.001)**	-0.0016	(0.001)**
Water	-0.0003	(0.004)	0.0003	(0.004)	0.0004	(0.004)
Motorbike	0.0301	(0.015) **	0.0338	(0.015)**	0.0332	(0.015)**
Bicycle	0.0046	(0.003)	0.0058	(0.003)*	0.0057	(0.003)*
Schooling						
HH Schooling	0.0008	(0.001)	0.0009	(0.001)	0.0009	(0.001)
Average Schooling	0.0006	(0.001)	0.0006	(0.001)	0.0006	(0.001)
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0144	(0.034)	-0.0184	(0.035)	-0.0177	(0.035)
Minorities	-0.0118	(0.005) **	-0.0122	(0.005)***	-0.0118	(0.005)**
Employment (0=agriculture)						
Skilled labor	-0.0240	(0.013) *	-0.0258	(0.013)*	-0.0256	(0.013)*
Unskilled labor	-0.0019	(0.008)	-0.0002	(0.008)	0.0003	(0.008)
Sales	-0.0148	(0.035)	-0.0181	(0.035)	-0.0180	(0.035)
Government jobs	-0.0231	(0.068)	-0.0258	(0.069)	-0.0237	(0.069)
Professional work	0.0068	(0.012)	0.0053	(0.012)	0.0051	(0.012)
Other work	-0.0005	(0.004)	-0.0001	(0.004)	-0.0001	(0.004)
Regions (0=Northern Uplands)						
Red River Delta	0.0178	(0.005) ***	0.0172	(0.005)***	0.0170	(0.005)***
North Central Coast	0.0092	(0.005) *	0.0085	(0.005)	0.0084	(0.005)
South Central Coast	0.0131	(0.006) **	0.0119	(0.007)*	0.0119	(0.007)*
Central Highlands	0.0169	(0.011)	0.0350	(0.010)***	0.0332	(0.010)***
South East	0.0494	(0.008) ***	0.0536	(0.008)***	0.0532	(0.008)***
Mekong Delta	0.0070	(0.006)	0.0093	(0.006)	0.0093	(0.006)
Constant	0.0978	(0.021) ***	0.1005	(0.022)***	0.0992	(0.022)***
	R^2=0.19		R^2=0.18		R^2=0.18	

B2.5 Model (3) OLS Regression on expenditure growth, All rural households (N=3396)

	Formal Credit		VBP		Informal Credit	
Ratio of loan to exp.	-0.0197	(0.006)***	-0.0423	(0.018)**	-0.0175	(0.004)***
Commune characteristics						
New secondary school	0.0058	(0.003)**	0.0057	(0.003)**	0.0060	(0.003)**
New infrastructure	0.0078	(0.005)	0.0080	(0.005)	0.0085	(0.005)
Crop failure	-0.0168	(0.005)***	-0.0172	(0.005)***	-0.0168	(0.005)***
Factory after 1989	0.0083	(0.003)***	0.0081	(0.003)***	0.0075	(0.003)**
Household Characteristics						
HH Age	-0.0019	(0.001)***	-0.0019	(0.001)***	-0.0019	(0.001)***
(HH Age)Sq	0.0000	(0.000)**	0.0000	(0.000)**	0.0000	(0.000)**
Gender	-0.0023	(0.004)	-0.0027	(0.004)	-0.0026	(0.004)
Log(saving)	-0.0022	(0.000)***	-0.0023	(0.000)***	-0.0022	(0.000)***
Dlog(hhsize)	-0.0848	(0.004)***	-0.0852	(0.004)***	-0.0846	(0.004)***
# of male elderly	-0.0088	(0.005)*	-0.0089	(0.005)*	-0.0092	(0.005)*
# of female elderly	-0.0086	(0.004)**	-0.0082	(0.004)**	-0.0085	(0.004)**
# of female, age 18-55	-0.0026	(0.002)	-0.0025	(0.002)	-0.0025	(0.002)
# of male, age 18-60	-0.0083	(0.002)***	-0.0084	(0.002)***	-0.0084	(0.002)***
# of children, 6-17yrs	0.0037	(0.001)***	0.0036	(0.001)***	0.0037	(0.001)***
Land and Other Assets						
Log(annual crop land)	-0.0014	(0.001)**	-0.0014	(0.001)***	-0.0014	(0.001)***
Water	-0.0035	(0.003)	-0.0037	(0.003)	-0.0039	(0.003)
Motorbike	0.0092	(0.007)	0.0094	(0.007)	0.0093	(0.007)
Bicycle	0.0080	(0.003)***	0.0076	(0.003)***	0.0082	(0.003)***
Schooling						
HH Schooling	0.0009	(0.000)**	0.0009	(0.000)**	0.0009	(0.000)*
Average Schooling	-0.0001	(0.000)	-0.0002	(0.000)	-0.0002	(0.000)
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0066	(0.021)	-0.0052	(0.021)	-0.0063	(0.021)
Minorities	-0.0073	(0.004)*	-0.0065	(0.004)	-0.0079	(0.004)*
Employment (0=agriculture)						
Skilled labor	-0.0166	(0.009)*	-0.0167	(0.009)*	-0.0168	(0.009)*
Unskilled labor	0.0067	(0.007)	0.0064	(0.007)	0.0055	(0.007)
Sales	-0.0129	(0.018)	-0.0120	(0.018)	-0.0105	(0.018)
Government jobs	0.0059	(0.034)	0.0020	(0.034)	0.0004	(0.034)
Professional work	-0.0094	(0.008)	-0.0101	(0.008)	-0.0100	(0.008)
Other work	0.0012	(0.003)	0.0010	(0.003)	0.0010	(0.003)
Regions (0=Northern Uplands)						
Red River Delta	0.0127	(0.005)***	0.0133	(0.005)***	0.0138	(0.005)***
North Central Coast	0.0081	(0.005)	0.0091	(0.005)*	0.0085	(0.005)*
South Central Coast	-0.0078	(0.006)	-0.0068	(0.006)	-0.0069	(0.006)
Central Highlands	0.0159	(0.008)*	0.0110	(0.008)	0.0153	(0.008)*
South East	0.0325	(0.006)***	0.0311	(0.006)***	0.0319	(0.006)***
Mekong Delta	-0.0208	(0.005)***	-0.0226	(0.005)***	-0.0227	(0.005)***
Constant	0.1210	(0.018)***	0.1212	(0.018)***	0.1213	(0.018)***
	R^2=0.19		R^2=0.18		R^2=0.19	

B2.6 Model (3) OLS Regression on expenditure growth, rural poor (N=1956)

	Formal Credit		VBP		Informal Credit	
Ratio of loan to exp	-0.0006	(0.008)	-0.0441	(0.019)**	-0.0263	(0.006)***
Commune characteristics						
New secondary school	0.0060	(0.003)*	0.0056	(0.003)*	0.0062	(0.003)*
New infrastructure	0.0047	(0.007)	0.0045	(0.007)	0.0053	(0.006)
Crop failure	-0.0214	(0.007)***	-0.0210	(0.007)***	-0.0212	(0.007)***
Factory after 1989	0.0075	(0.004)*	0.0076	(0.004)*	0.0068	(0.004)*
Household Characteristics						
HH Age	-0.0001	(0.001)	-0.0001	(0.001)	-0.0002	(0.001)
(HH Age)Sq	0.0000	(0.000)	0.0000	(0.000)	0.0000	(0.000)
Gender	-0.0013	(0.005)	-0.0014	(0.005)	-0.0017	(0.005)
Log(saving)	0.0003	(0.001)	0.0002	(0.001)	0.0003	(0.001)
Dlog(hhsize)	-0.0796	(0.005)***	-0.0797	(0.005)***	-0.0786	(0.005)***
# of male elderly	-0.0051	(0.006)	-0.0049	(0.006)	-0.0053	(0.006)
# of female elderly	-0.0073	(0.004)*	-0.0071	(0.004)	-0.0074	(0.004)*
# of female, age 18-55	-0.0041	(0.003)	-0.0041	(0.003)	-0.0035	(0.003)
# of male, age 18-60	-0.0117	(0.003)***	-0.0116	(0.003)***	-0.0118	(0.003)***
# of children, 6-17yrs	-0.0015	(0.001)	-0.0015	(0.001)	-0.0013	(0.001)
Land and Other Assets						
Log(annual crop land)	-0.0016	(0.001)**	-0.0016	(0.001)**	-0.0016	(0.001)**
Water	0.0003	(0.004)	0.0004	(0.004)	0.0000	(0.004)
Motorbike	0.0338	(0.015)**	0.0333	(0.015)**	0.0334	(0.015)**
Bicycle	0.0059	(0.003)*	0.0054	(0.003)	0.0062	(0.003)*
Schooling						
HH Schooling	0.0009	(0.001)	0.0010	(0.001)*	0.0009	(0.001)
Average Schooling	0.0005	(0.001)	0.0006	(0.001)	0.0004	(0.001)
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0187	(0.035)	-0.0151	(0.035)	-0.0202	(0.034)
Minorities	-0.0122	(0.005)***	-0.0117	(0.005)**	-0.0130	(0.005)***
Employment (0=agriculture)						
Skilled labor	-0.0258	(0.013)*	-0.0257	(0.013)*	-0.0263	(0.013)**
Unskilled labor	-0.0002	(0.008)	-0.0002	(0.008)	-0.0016	(0.008)
Sales	-0.0181	(0.035)	-0.0190	(0.035)	-0.0178	(0.035)
Government jobs	-0.0257	(0.069)	-0.0273	(0.069)	-0.0299	(0.068)
Professional work	0.0053	(0.012)	0.0056	(0.012)	0.0052	(0.012)
Other work	-0.0001	(0.004)	-0.0001	(0.004)	-0.0001	(0.004)
Regions (0=Northern Uplands)						
Red River Delta	0.0172	(0.005)***	0.0168	(0.005)***	0.0179	(0.005)***
North Central Coast	0.0085	(0.005)	0.0091	(0.005)*	0.0088	(0.005)
South Central Coast	0.0119	(0.007)*	0.0121	(0.007)**	0.0115	(0.007)*
Central Highlands	0.0352	(0.010)***	0.0348	(0.010)***	0.0357	(0.010)***
South East	0.0537	(0.009)***	0.0533	(0.008)***	0.0542	(0.008)***
Mekong Delta	0.0093	(0.006)	0.0093	(0.006)	0.0088	(0.006)
Constant	0.1006	(0.022)***	0.1001	(0.021)***	0.1041	(0.021)***
	R^2=0.19		R^2=0.18		R^2=0.19	

B2.7 Model (3) First-stage Regressions (N=3396):
Predicting changes in the ratio of loan size to total household expenditures

	Formal loan		VBP		Informal Loan	
Instruments						
VBP	-0.0039	(0.013)	-0.0077	(0.004)*	0.0965	(0.018)***
Other formal banks	0.0169	(0.013)				
Other informal banks	0.0358	(0.012)***	-0.0137	(0.004)***	0.0221	(0.016)
Commune characteristics						
New secondary school	-0.0049	(0.008)	-0.0034	(0.003)	0.0175	(0.011)
New infrastructure	-0.0089	(0.016)	-0.0125	(0.006)**	0.0276	(0.023)
Crop failure	0.0350	(0.015)**	0.0054	(0.005)	0.0491	(0.022)**
Factory after 1989	0.0191	(0.010)**	0.0032	(0.003)	-0.0239	(0.013)*
Commune Geography (0=Coast)						
Inland delta	-0.0105	(0.016)	0.0071	(0.005)	-0.0243	(0.023)
Hill/midlands	0.0284	(0.022)	0.0047	(0.007)	-0.0129	(0.030)
Low mountains	0.0328	(0.018)*	0.0070	(0.006)	-0.0193	(0.025)
High mountains	0.0575	(0.022)***	0.0237	(0.007)***	-0.0072	(0.030)
Household Characteristics						
HH Age	-0.0004	(0.002)	0.0006	(0.001)	-0.0015	(0.003)
(HH Age)Sq	0.0000	(0.000)	0.0000	(0.000)	0.0000	(0.000)
Gender	0.0136	(0.011)	-0.0024	(0.004)	-0.0036	(0.016)
Log(saving)	-0.0004	(0.001)	-0.0011	(0.000)***	0.0022	(0.002)
Dlog(hhsize)	0.0155	(0.012)	-0.0028	(0.004)	0.0323	(0.016)**
# of male elderly	0.0092	(0.013)	-0.0011	(0.005)	-0.0086	(0.019)
# of female elderly	-0.0100	(0.010)	0.0030	(0.004)	-0.0052	(0.015)
# of female, age 18-55	-0.0055	(0.006)	-0.0005	(0.002)	-0.0029	(0.009)
# of male, age 18-60	0.0099	(0.006)	0.0029	(0.002)	0.0076	(0.009)
# of children, 6-17yrs	0.0021	(0.003)	-0.0009	(0.001)	0.0031	(0.004)
Land and Other Assets						
Log(annual crop land)	0.0040	(0.002)***	0.0000	(0.001)	0.0035	(0.002)
Water	0.0111	(0.010)	0.0006	(0.003)	-0.0212	(0.014)
Motorbike	-0.0269	(0.021)	-0.0070	(0.007)	-0.0229	(0.029)
Bicycle	0.0022	(0.009)	-0.0049	(0.003)*	0.0141	(0.012)
Schooling						
HH Schooling	0.0016	(0.001)	0.0010	(0.000)**	-0.0014	(0.002)
Average Schooling	0.0003	(0.001)	-0.0001	(0.000)	-0.0006	(0.002)
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0249	(0.061)	0.0179	(0.021)	-0.0084	(0.086)
Minorities	-0.0369	(0.014)***	0.0069	(0.005)	-0.0546	(0.019)***
Employment (0=agriculture)						
Skilled labor	0.0146	(0.027)	0.0015	(0.009)	-0.0110	(0.037)
Unskilled labor	0.0149	(0.021)	-0.0034	(0.007)	-0.0545	(0.029)*
Sales	-0.0736	(0.052)	-0.0141	(0.018)	0.0525	(0.073)
Government jobs	0.1711	(0.098)*	-0.0103	(0.033)	-0.1403	(0.137)
Professional work	0.0381	(0.023)*	-0.0003	(0.008)	0.0108	(0.032)
Other work	0.0151	(0.009)	0.0013	(0.003)	-0.0015	(0.013)

Regions (0=Northern Uplands)						
Red River Delta	-0.0178	(0.014)	0.0029	(0.005)	0.0144	(0.020)
North Central Coast	-0.0061	(0.015)	0.0174	(0.005)***	0.0081	(0.021)
South Central Coast	-0.0225	(0.017)	0.0096	(0.006)	-0.0109	(0.023)
Central Highlands	0.1963	(0.027)***	-0.0184	(0.009)**	0.1894	(0.037)***
South East	0.0770	(0.019)***	-0.0022	(0.006)	0.0499	(0.027)*
Mekong Delta	0.1048	(0.016)***	0.0022	(0.006)	0.0015	(0.023)
Constant	-0.0388	(0.054)	0.0041	(0.018)	-0.0123	(0.075)
	Prob >F = 0.006		Prob>F = 0.002		Prob>F = 0.000	
	R^2=0.07		R^2=0.02		R^2=0.02	

B2.8 Model (3) 2SLS Regression on expenditure growth, All rural (N=3396)

	Formal Credit	VBP	Informal Credit
Ratio of loan to exp	-0.1750 (0.109)	0.3324 (0.308)	0.0322 (0.049)
Commune characteristics			
New secondary school	0.0022 (0.006)	0.0086 (0.006)	0.0050 (0.006)
New infrastructure	-0.0107 (0.007)	-0.0190 (0.006)***	-0.0184 (0.006)***
Crop failure	0.0050 (0.003)	0.0065 (0.003)**	0.0056 (0.003)**
Factory after 1989	0.0099 (0.005)***	0.0049 (0.004)	0.0064 (0.004)*
Commune Geography (0=Coast)			
Inland delta	0.0000 (0.006)	-0.0006 (0.006)	0.0020 (0.006)
Hill/midlands	0.0057 (0.009)	-0.0008 (0.008)	0.0006 (0.008)
Low mountains	-0.0064 (0.008)	-0.0148 (0.007)**	-0.0122 (0.006)*
High mountains	-0.0054 (0.010)	-0.0234 (0.011)**	-0.0139 (0.008)*
Household Characteristics			
HH Age	-0.0021 (0.001)***	-0.0022 (0.001)***	-0.0019 (0.001)***
(HH Age)Sq	0.0000 (0.000)**	0.0000 (0.000)***	0.0000 (0.000)**
Gender	0.0002 (0.005)	-0.0014 (0.004)	-0.0024 (0.004)
Log(saving)	-0.0023 (0.000)***	-0.0019 (0.001)***	-0.0023 (0.000)***
Dlog(hhsize)	-0.0822 (0.005)***	-0.0840 (0.004)***	-0.0861 (0.004)***
# of male elderly	-0.0073 (0.005)	-0.0085 (0.005)*	-0.0083 (0.005)*
# of female elderly	-0.0102 (0.004)**	-0.0094 (0.004)**	-0.0085 (0.004)**
# of female, age 18-55	-0.0033 (0.002)	-0.0023 (0.002)	-0.0025 (0.002)
# of male, age 18-60	-0.0067 (0.003)***	-0.0094 (0.002)***	-0.0086 (0.002)***
# of children, 6-17yrs	0.0041 (0.001)***	0.0041 (0.001)***	0.0037 (0.001)***
Land and Other Assets			
Log(annual crop land)	-0.0007 (0.001)	-0.0014 (0.001)**	-0.0015 (0.001)***
Water	-0.0019 (0.004)	-0.0037 (0.004)	-0.0029 (0.004)
Motorbike	0.0047 (0.008)	0.0118 (0.008)	0.0100 (0.007)
Bicycle	0.0082 (0.003)**	0.0090 (0.004)**	0.0069 (0.003)**
Schooling			
HH Schooling	0.0012 (0.001)**	0.0006 (0.001)	0.0009 (0.000)*
Average Schooling	0.0000 (0.001)	0.0000 (0.001)	-0.0001 (0.000)
Ethnicity (0=Vietnamese Kinh)			
Chinese	-0.0084 (0.024)	-0.0095 (0.023)	-0.0031 (0.022)
Minorities	-0.0067 (0.006)	-0.0026 (0.005)	0.0008 (0.005)
Employment (0=agriculture)			
Skilled labor	-0.0160 (0.010)	-0.0186 (0.010)**	-0.0181 (0.009)*
Unskilled labor	0.0069 (0.008)	0.0051 (0.008)	0.0062 (0.008)
Sales	-0.0246 (0.021)	-0.0077 (0.020)	-0.0140 (0.019)
Government jobs	0.0332 (0.042)	0.0069 (0.037)	0.0068 (0.035)
Professional work	-0.0040 (0.010)	-0.0106 (0.009)	-0.0110 (0.008)
Other work	0.0030 (0.004)	-0.0001 (0.003)	0.0004 (0.003)
Regions (0=Northern Uplands)			
Red River Delta	0.0052 (0.006)	0.0074 (0.005)	0.0071 (0.005)
North Central Coast	0.0032 (0.006)	-0.0020 (0.008)	0.0050 (0.005)
South Central Coast	-0.0151 (0.007)**	-0.0141 (0.007)**	-0.0119 (0.006)**
Central Highlands	0.0523 (0.025)**	0.0244 (0.012)**	0.0091 (0.014)
South East	0.0396 (0.011)***	0.0268 (0.007)***	0.0258 (0.007)***
Mekong Delta	-0.0116 (0.014)	-0.0320 (0.006)***	-0.0305 (0.006)***
Constant	0.1267 (0.021)***	0.1327 (0.020)***	0.1317 (0.019)***
	R^2=0.02	R^2=0.08	R^2=0.15

B2.9 Model (3) 2SLS Regression on expenditure growth, rural poor (N=1956)

	Formal Credit		VBP		Informal Credit	
Ratio of loan to exp	0.1565	(0.093)*	-0.6880	(0.402)*	0.1641	(0.119)
Commune characteristics						
New secondary school	0.0054	(0.008)	-0.0038	(0.009)	-0.0014	(0.008)
New infrastructure	-0.0311	(0.009)***	-0.0191	(0.010)**	-0.0263	(0.009)***
Crop failure	0.0067	(0.004)*	0.0014	(0.005)	0.0055	(0.004)
Factory after 1989	-0.0002	(0.005)	0.0037	(0.005)	0.0066	(0.006)
Commune Geography (0=Coast)						
Inland delta	0.0007	(0.007)	0.0064	(0.009)	0.0052	(0.009)
Hill/midlands	-0.0188	(0.010)*	-0.0140	(0.011)	-0.0156	(0.011)
Low mountains	-0.0269	(0.009)***	-0.0182	(0.009)**	-0.0166	(0.009)*
High mountains	-0.0207	(0.010)**	-0.0010	(0.014)	-0.0130	(0.011)
Household Characteristics						
HH Age	0.0003	(0.001)	0.0004	(0.001)	0.0004	(0.001)
(HH Age)Sq	0.0000	(0.000)	0.0000	(0.000)	0.0000	(0.000)
Gender	-0.0009	(0.005)	-0.0028	(0.006)	0.0013	(0.006)
Log(saving)	0.0005	(0.001)	-0.0007	(0.001)	0.0002	(0.001)
Dlog(hhsize)	-0.0772	(0.006)***	-0.0807	(0.007)***	-0.0853	(0.008)***
# of male elderly	-0.0050	(0.006)	-0.0015	(0.008)	-0.0039	(0.007)
# of female elderly	-0.0030	(0.005)	-0.0045	(0.006)	-0.0069	(0.005)
# of female, age 18-55	-0.0039	(0.003)	-0.0040	(0.004)	-0.0074	(0.004)*
# of male, age 18-60	-0.0128	(0.003)***	-0.0107	(0.003)***	-0.0111	(0.003)***
# of children, 6-17yrs	-0.0016	(0.001)	-0.0015	(0.002)	-0.0025	(0.002)
Land and Other Assets						
Log(annual crop land)	-0.0016	(0.001)**	-0.0014	(0.001)	-0.0016	(0.001)*
Water	-0.0010	(0.005)	0.0038	(0.005)	0.0032	(0.005)
Motorbike	0.0410	(0.017)**	0.0234	(0.019)	0.0351	(0.019)*
Bicycle	0.0020	(0.004)	-0.0009	(0.006)	0.0036	(0.005)
Schooling						
HH Schooling	0.0007	(0.001)	0.0017	(0.001)**	0.0012	(0.001)*
Average Schooling	0.0006	(0.001)	0.0017	(0.001)*	0.0014	(0.001)
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0036	(0.038)	0.0378	(0.054)	-0.0068	(0.044)
Minorities	-0.0046	(0.006)	-0.0018	(0.007)	-0.0009	(0.008)
Employment (0=agriculture)						
Skilled labor	-0.0230	(0.015)	-0.0269	(0.017)	-0.0243	(0.017)
Unskilled labor	-0.0107	(0.010)	-0.0025	(0.010)	0.0058	(0.012)
Sales	-0.0087	(0.039)	-0.0353	(0.045)	-0.0228	(0.044)
Government jobs	-0.0322	(0.074)	-0.0573	(0.088)	-0.0049	(0.088)
Professional work	0.0020	(0.013)	0.0084	(0.016)	0.0031	(0.015)
Other work	-0.0016	(0.004)	-0.0009	(0.005)	-0.0011	(0.005)
Regions (0=Northern Uplands)						
Red River Delta	0.0114	(0.006)*	0.0030	(0.008)	0.0037	(0.008)
North Central Coast	0.0046	(0.006)	0.0149	(0.010)	0.0016	(0.007)
South Central Coast	0.0097	(0.008)	0.0065	(0.009)	0.0079	(0.009)
Central Highlands	-0.0076	(0.027)	0.0226	(0.015)	0.0289	(0.014)**
South East	0.0337	(0.013)***	0.0438	(0.011)***	0.0458	(0.011)***
Mekong Delta	-0.0179	(0.011)*	-0.0020	(0.009)	-0.0020	(0.009)
Constant	0.1124	(0.025)***	0.1113	(0.029)***	0.0968	(0.033)***
	R^2=0.04		R^2=---		R^2=---	

3. *Section 7.3*

B3.1 First-stage Regressions, predicting # of migrants (n=3396, 1956)

		All households		Poor households	
Mig network		1.3316	(0.165)***	1.3441	(0.251)***
Commune	New sec. school	0.0279	(0.017)*	0.0614	(0.024)**
Characteristics	New Agr. Infra	0.0180	(0.018)	0.0095	(0.025)
	New Road	0.0131	(0.019)	-0.0398	(0.027)
	Crop failure	-0.0125	(0.033)	-0.0042	(0.053)
	Factory after 1989	-0.0044	(0.020)	-0.0184	(0.031)
	New sec. school	0.0279	(0.017)*	0.0614	(0.024)**
Commune Geography	Inland delta	-0.0366	(0.035)	-0.0121	(0.050)
(0=Coast)	Hill/midlands	0.1136	(0.047)**	0.1607	(0.067)**
	Low mountains	-0.0832	(0.038)**	-0.0994	(0.054)*
	High mountains	-0.0684	(0.046)	-0.0782	(0.064)
Household	HH member's death	0.0230	(0.026)	0.0348	(0.037)
Characteristics	Dlog(hhsize)	0.0867	(0.025)***	0.1013	(0.037)***
	# of male elderly	-0.0043	(0.027)	-0.0349	(0.040)
	# of female elderly	0.0029	(0.022)	0.0327	(0.031)
	# of female, age 18-55	0.0216	(0.013)*	0.0217	(0.020)
	# of male, age 18-60	0.0147	(0.012)	0.0158	(0.018)
	# of children, 6-17yrs	0.0364	(0.006)***	0.0427	(0.009)***
	HH Age	-0.0003	(0.004)	0.0014	(0.006)
	(HH Age)Sq	0.0000	(0.000)	0.0000	(0.000)
Land & Other Assets	Log(annual crop land)	-0.0026	(0.003)	-0.0057	(0.005)
	Log(perennial crop land)	-0.0116	(0.043)	--	
	Water	0.0068	(0.020)	0.0302	(0.029)
	Motorbike	-0.0746	(0.043)*	-0.0429	(0.106)
	Bicycle	-0.0134	(0.017)	-0.0044	(0.024)
Schooling	HH Schooling	0.0018	(0.003)	0.0013	(0.004)
	Average Schooling	-0.0012	(0.003)	-0.0018	(0.004)
Ethnicity	Chinese	-0.1086	(0.127)	0.0660	(0.246)
(0=Vietnamese)	Minorities	-0.0347	(0.028)	-0.0363	(0.038)
Employment	Skilled labor	0.1348	(0.055)**	0.2494	(0.096)***
(0=agriculture)	Unskilled labor	-0.0198	(0.043)	-0.0212	(0.059)
	Sales	0.1970	(0.108)*	0.9717	(0.250)***
	Government jobs	-0.1673	(0.203)	-0.4929	(0.492)
	Professional work	0.0510	(0.048)	0.0909	(0.086)
	Other work	0.0461	(0.019)**	0.0466	(0.028)*
	Red River Delta	0.0063	(0.030)	0.0545	(0.042)
	North Central Coast	0.0432	(0.032)	0.0739	(0.042)*
	South Central Coast	0.0282	(0.034)	0.0488	(0.048)
	Central Highlands	-0.0543	(0.056)	-0.0389	(0.079)
	South East	-0.1008	(0.039)***	-0.0799	(0.062)
	Mekong Delta	-0.0057	(0.033)	0.0088	(0.050)
	Constant	0.0320	(0.108)	-0.0101	(0.155)
		R^2=0.06		R^2=0.07	

B3.2 Second-stage Regressions (simultaneous 2SLS model)

	All households N=3396		Poor households N=1956		Non-poor households N=1440	
# of migrants	0.0483	(0.022)**	0.0371	(0.027)	0.0929	(0.032)***
Commune characteristics						
New sec. school	0.0044	(0.003)	0.0047	(0.004)	0.0029	(0.005)
New Agr. Infra	-0.0007	(0.003)	0.0009	(0.003)	-0.0094	(0.005)*
New roads	-0.0045	(0.003)	0.0019	(0.004)	-0.0099	(0.006)*
Crop failure	-0.0129	(0.007)**	-0.0221	(0.008)***	-0.0031	(0.010)
Factory after 1989	0.0040	(0.004)	0.0029	(0.004)	0.0036	(0.005)
Commune Geography (0=Coast)						
Inland delta	0.0054	(0.007)	0.0045	(0.007)	0.0233	(0.011)**
Hill/midlands	0.0011	(0.008)	-0.0189	(0.010)**	0.0287	(0.014)**
Low mountains	-0.0056	(0.007)	-0.0135	(0.009)	0.0202	(0.012)*
High mountains	-0.0078	(0.009)	-0.0104	(0.010)	0.0054	(0.015)
Household Characteristics						
HH member's death	-0.0004	(0.005)	-0.0044	(0.006)	0.0055	(0.007)
Dlog(hhsize)	-0.0894	(0.006)***	-0.0834	(0.007)***	-0.0846	(0.007)***
# of male elderly	-0.0101	(0.005)**	-0.0038	(0.007)	-0.0135	(0.006)*
# of female elderly	-0.0093	(0.004)***	-0.0084	(0.004)*	0.0003	(0.006)
# of female, age 18-55	-0.0045	(0.003)*	-0.0049	(0.003)	-0.0076	(0.004)*
# of male, age 18-60	-0.0098	(0.002)***	-0.0125	(0.003)***	-0.0103	(0.003)***
# of children, 6-17yrs	0.0019	(0.001)	-0.0028	(0.002)*	0.0008	(0.002)
HH Age	-0.0020	(0.001)***	-0.0004	(0.001)	0.0002	(0.001)
(HH Age)Sq	0.0000	(0.000)**	0.0000	(0.000)	0.0000	(0.000)
Land and Other Assets						
Log(annual crop land)	-0.0013	(0.001)**	-0.0015	(0.001)*	0.0006	(0.001)
Log(perennial crop land)	0.0075	(0.005)			0.0091	(0.003)***
Water	-0.0037	(0.004)	0.0005	(0.004)	0.0042	(0.006)
Motorbike	0.0091	(0.008)	0.0340	(0.015)**	0.0228	(0.010)**
Bicycle	0.0067	(0.003)**	0.0063	(0.003)*	0.0177	(0.005)***
Schooling						
HH Schooling	0.0005	(0.000)	0.0009	(0.001)	0.0027	(0.001)***
Average Schooling	-0.0001	(0.000)	0.0008	(0.001)	0.0013	(0.001)*
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0007	(0.023)	-0.0167	(0.027)	0.0275	(0.030)
Minorities	0.0026	(0.005)	-0.0041	(0.006)	-0.0102	(0.008)
Employment (0=agriculture)						
Skilled labor	-0.0243	(0.009)***	-0.0368	(0.015)**	-0.0081	(0.012)
Unskilled labor	0.0071	(0.006)	-0.0020	(0.007)	0.0134	(0.011)
Sales	-0.0240	(0.023)	-0.0555	(0.070)	0.0216	(0.023)
Government jobs	0.0122	(0.021)	-0.0226	(0.012)*	0.0426	(0.028)
Professional work	-0.0134	(0.010)	-0.0002	(0.014)	-0.0013	(0.013)
Other work	-0.0023	(0.004)	-0.0034	(0.004)	-0.0037	(0.005)

Regions (0=Northern Uplands)						
Red River Delta	0.0097	(0.005)**	0.0054	(0.006)	0.0027	(0.009)
North Central Coast	0.0048	(0.005)	-0.0012	(0.006)	-0.0012	(0.010)
South Central Coast	-0.0124	(0.006)**	0.0035	(0.008)	-0.0102	(0.010)
Central Highlands	0.0219	(0.010)**	0.0367	(0.013)***	0.0245	(0.016)
South East	0.0310	(0.008)***	0.0523	(0.009)***	0.0467	(0.012)***
Mekong Delta	-0.0313	(0.006)***	-0.0058	(0.007)	-0.0253	(0.009)***
Constant	0.1274	(0.020)***	0.1184	(0.023)***	-0.0249	(0.031)
	R^2=0.12		R^2=0.14		R^2=0.07	

B3.3 Second-stage Regressions (sequential 2SLS model)

	All households N=3396		Poor households N=1956		Non-poor households N=1440	
# of migrants	0.0301	(0.022)	0.0062	(0.028)	0.1015	(0.032)***
Ho Chi Minh City	0.0964	(0.043)**	0.0618	(0.048)	0.0635	(0.072)
Hanoi	0.0602	(0.027)**	0.1005	(0.033)***	0.0021	(0.039)
Commune characteristics						
New sec. school	0.0042	(0.003)	0.0059	(0.003)*	-0.0022	(0.004)
New Agr. Infra	-0.0007	(0.003)	0.0003	(0.003)	-0.0105	(0.005) **
New roads	-0.0041	(0.003)	0.0006	(0.004)	-0.0043	(0.005)
Crop failure	-0.0107	(0.006)*	-0.0174	(0.008)**	-0.0017	(0.008)
Factory after 1989	0.0040	(0.003)	0.0023	(0.004)	0.0043	(0.005)
Commune Geography (0=Coast)						
Inland delta	0.0047	(0.006)	0.0027	(0.007)	0.0208	(0.009) **
Hill/midlands	-0.0010	(0.008)	-0.0215	(0.010)**	0.0215	(0.013) *
Low mountains	-0.0074	(0.007)	-0.0187	(0.009)**	0.0239	(0.011) **
High mountains	-0.0097	(0.008)	-0.0154	(0.010)	0.0065	(0.013)
Household Characteristics						
HH member's death	-0.0001	(0.004)	-0.0034	(0.005)	0.0032	(0.007)
Dlog(hhsize)	-0.0884	(0.005)***	-0.0809	(0.006)***	-0.0864	(0.007) ***
# of male elderly	-0.0100	(0.005)**	-0.0049	(0.006)	-0.0117	(0.006) *
# of female elderly	-0.0092	(0.004)	-0.0072	(0.004)	-0.0030	(0.005)
# of female, age 18-55	-0.0041	(0.002)*	-0.0043	(0.003)	-0.0078	(0.003) **
# of male, age 18-60	-0.0097	(0.002)***	-0.0123	(0.003)***	-0.0108	(0.003) ***
# of children, 6-17yrs	0.0023	(0.001)*	-0.0017	(0.002)	-0.0011	(0.002)
HH Age	-0.0020	(0.001)***	-0.0003	(0.001)	0.0003	(0.001)
(HH Age)Sq	0.0000	(0.000)	0.0000	(0.000)	0.0000	(0.000)
Land and Other Assets						
Log(annual crop land)	-0.0014	(0.001)**	-0.0017	(0.001)**	0.0009	(0.001)
Log(perennial crop land)	0.0075	(0.007)			0.0099	(0.007)
Water	-0.0036	(0.003)	0.0016	(0.004)	0.0018	(0.005)
Motorbike	0.0081	(0.007)	0.0342	(0.015)**	0.0247	(0.009) ***
Bicycle	0.0065	(0.003)**	0.0066	(0.003)*	0.0167	(0.005) ***
Schooling						
HH Schooling	0.0005	(0.000)	0.0009	(0.001)	0.0031	(0.001) ***
Average Schooling	-0.0002	(0.000)	0.0007	(0.001)	0.0013	(0.001) *
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.0017	(0.022)	-0.0137	(0.035)	0.0297	(0.026)
Minorities	0.0020	(0.005)	-0.0053	(0.005)	-0.0075	(0.009)

Employment (0=agriculture)						
Skilled labor	-0.0218	(0.010)	-0.0277	(0.014)**	-0.0132	(0.013)
Unskilled labor	0.0065	(0.007)	-0.0032	(0.008)	0.0122	(0.012)
Sales	-0.0239	(0.019)	-0.0282	(0.036)	0.0007	(0.021)
Government jobs	0.0100	(0.034)	-0.0341	(0.069)	0.0517	(0.038)
Professional work	-0.0128	(0.008)	0.0024	(0.012)	-0.0049	(0.010)
Other work	-0.0020	(0.003)	-0.0026	(0.004)	-0.0044	(0.005)
Regions (0=Northern Uplands)						
Red River Delta	0.0092	(0.005)	0.0062	(0.006)	-0.0028	(0.008)
North Central Coast	0.0056	(0.006)	0.0018	(0.006)	-0.0096	(0.010)
South Central Coast	-0.0121	(0.006)**	0.0052	(0.007)	-0.0122	(0.009)
Central Highlands	0.0218	(0.009)**	0.0368	(0.011)***	0.0234	(0.016)
South East	0.0302	(0.007)***	0.0507	(0.009)***	0.0456	(0.011)***
Mekong Delta	-0.0312	(0.006)***	-0.0049	(0.007)	-0.0254	(0.009)***
Constant	0.1274	(0.018)***	0.1174	(0.022)***	-0.0285	(0.029)
	R^2=0.17		R^2=0.19		R^2=0.24	

4. *Section 7.4*

B4.1 Regressions on Winners (Maddala model)

	All households		Poor households		Non-poor households	
# of migrants	0.3119	(0.379)	0.5378	(0.524)	0.8355	(0.594)
Credit in 1992						
Private banks	0.3271	(0.141)**	0.4318	(0.174)**	-0.2561	(0.337)
Government banks	-0.3014	(0.082)***	-0.3492	(0.110)***	-0.1546	(0.139)
Informal credit	-0.0422	(0.057)	-0.0765	(0.071)	-0.1279	(0.116)
Commune characteristics						
New sec. school	0.1625	(0.055)***	0.1543	(0.075)**	0.1401	(0.109)
New Agr. Infra.	0.1149	(0.059)**	0.1624	(0.074)**	-0.0471	(0.115)
New roads	-0.0386	(0.060)	0.0570	(0.084)	-0.1583	(0.115)
Crop failure	-0.2174	(0.102)**	-0.3542	(0.146)**	-0.1253	(0.173)
Factory after 1989	0.0393	(0.065)	0.0939	(0.087)	-0.1348	(0.116)
Commune Geography (0=Coast)						
Inland delta	0.1306	(0.114)	0.1626	(0.146)	0.3302	(0.218)
Hill/midlands	0.0593	(0.153)	-0.1570	(0.207)	0.4774	(0.273)*
Low mountains	0.0227	(0.134)	0.0696	(0.175)	0.2653	(0.258)
High mountains	0.0906	(0.156)	0.0309	(0.202)	0.3253	(0.309)
Household Characteristics						
Save	-0.1411	(0.056)**	0.0797	(0.075)	-0.1565	(0.100)
Dlog(hhsize)	0.1091	(0.089)	0.0802	(0.116)	0.2735	(0.169)
# of elderly males	-1.1644	(0.116)***	-1.2878	(0.162)***	-0.8867	(0.209)***
# of elderly females	0.1251	(0.091)	0.1264	(0.125)	0.0799	(0.163)
# of female, 18-55	0.1086	(0.075)	0.2315	(0.101)**	-0.1247	(0.134)
# of male, 18-60	-0.0151	(0.044)	-0.0341	(0.059)	-0.0072	(0.082)
# of 6-17yrs	0.1522	(0.047)***	0.1416	(0.066)**	0.0908	(0.079)
kids617	0.0227	(0.026)	0.0140	(0.032)	0.0172	(0.056)
Gender	-0.0624	(0.070)	0.0011	(0.092)	-0.3017	(0.128)**
HH Age	-0.0176	(0.014)	-0.0377	(0.017)**	0.0602	(0.031)*
(HH Age)Sq	0.0001	(0.000)	0.0003	(0.000)**	-0.0006	(0.000)**
Land and Other Assets						
Log(annual crop land)	-0.0275	(0.010)***	-0.0488	(0.015)***	0.0180	(0.018)
Log(perennial crop land)	0.0820	(0.163)			0.1608	(0.193)
Water	-0.0968	(0.067)	-0.0679	(0.088)	-0.0918	(0.127)
Forest	-0.2852	(0.094)***	-0.3660	(0.113)***	0.0069	(0.195)
Motorbike	0.0913	(0.135)	0.7094	(0.304)**	0.1910	(0.174)
Bicycle	0.0488	(0.057)	-0.0128	(0.071)	0.2561	(0.120)**
Schooling						
HH Schooling	0.0062	(0.009)	0.0174	(0.012)	0.0384	(0.016)**
Average Schooling	0.0113	(0.009)	0.0037	(0.012)	0.0594	(0.017)***
Ethnicity (0=Vietnamese Kinh)						
Chinese	0.2555	(0.404)	0.0485	(0.732)	0.5682	(0.553)
Minorities	0.0845	(0.098)	0.1344	(0.120)	-0.7747	(0.303)**

Employment (0=agriculture)						
Skilled labor	-0.3922	(0.197)	-0.4252	(0.318)	-0.3162	(0.286)
Unskilled labor	0.0879	(0.134)	0.0752	(0.168)	0.0586	(0.260)
Sales	-0.8143	(0.429)*	-1.3632	(0.933)	-0.4786	(0.578)
Government jobs	-0.3112	(0.666)	--		0.2097	(0.729)
Professional work	-0.1413	(0.161)	-0.0526	(0.252)	-0.0608	(0.246)
Other work	-0.0029	(0.066)	-0.0365	(0.088)	0.0400	(0.117)
Regions (0=Northern Uplands)						
Red River Delta	0.2200	(0.099)**	0.3024	(0.129)**	-0.2938	(0.199)
North Central Coast	0.2467	(0.107)**	0.3159	(0.138)**	-0.2194	(0.222)
South Central Coast	0.0189	(0.113)	0.2558	(0.148)*	-0.3400	(0.219)
Central Highlands	0.2361	(0.179)	0.3775	(0.226)*	-0.1449	(0.395)
South East	0.6665	(0.129)***	0.9741	(0.183)***	0.6055	(0.230)***
Mekong Delta	-0.1657	(0.113)	-0.0556	(0.150)	-0.2798	(0.212)
Constant	-0.2601	(0.370)	0.2648	(0.461)	-3.1446	(0.818)***

B4.2 Regressions on Losers (Maddala model)

	All households		Poor households		Non-poor households	
# of migrants	-1.2709	(0.461)***	-1.1332	(0.772)	-1.9073	(0.597)***
Credit in 1992						
Private banks	-0.0713	(0.168)	-0.5688	(0.316) *	0.3766	(0.273)
Government banks	0.1482	(0.079)*	0.0603	(0.128)	0.1078	(0.117)
Informal credit	-0.0011	(0.059)	-0.0100	(0.085)	0.0792	(0.100)
Commune characteristics						
New sec. school	-0.0223	(0.058)	0.0102	(0.096)	-0.0269	(0.094)
New Agr. Infra.	0.0572	(0.062)	-0.0329	(0.092)	0.2106	(0.101)**
New roads	0.0512	(0.065)	0.0128	(0.104)	0.1137	(0.111)
Crop failure	0.1025	(0.116)	0.0425	(0.214)	0.0882	(0.165)
Factory after 1989	-0.1267	(0.068)*	-0.0329	(0.114)	-0.1563	(0.102)
Commune Geography (0=Coast)						
Inland delta	-0.0324	(0.123)	0.0065	(0.201)	-0.1912	(0.194)
Hill/midlands	0.0609	(0.171)	0.3415	(0.267)	-0.1293	(0.267)
Low mountains	0.0583	(0.146)	0.3442	(0.240)	-0.3095	(0.231)
High mountains	0.2082	(0.166)	0.3818	(0.266)	0.1240	(0.274)
Household Characteristics						
Save	0.1697	(0.058)	-0.0095	(0.092)	0.0052	(0.089)
Dlog(hhsize)	0.0873	(0.099)	0.0743	(0.142)	0.1044	(0.161)
# of male elderly	1.6323	(0.122)***	1.5578	(0.196)***	1.4430	(0.186)***
# of female elderly	-0.0826	(0.097)	-0.0956	(0.162)	0.0362	(0.146)
# of female, age 18-55	-0.0287	(0.082)	-0.1292	(0.128)	0.1521	(0.125)
# of male, age 18-60	-0.0664	(0.047)	-0.1008	(0.076)	0.0432	(0.074)
# of children, 6-17yrs	-0.2129	(0.051)***	-0.2039	(0.088)**	-0.1170	(0.072)
kids617	-0.1192	(0.028)***	-0.1234	(0.038)***	-0.0371	(0.050)
Gender	0.0427	(0.074)	0.0044	(0.112)	0.1522	(0.117)
HH Age	0.0206	(0.014)	0.0277	(0.020)	-0.0014	(0.024)

Land and Other Assets						
Log(annual crop land)	-0.0014	(0.011)	0.0134	(0.019)	-0.0180	(0.016)
Log(perennial crop land)	0.0961	(0.148)			0.0200	(0.166)
Water	0.0451	(0.069)	0.0080	(0.108)	-0.1093	(0.110)
Forest	0.1597	(0.092)*	0.1189	(0.121)	0.2065	(0.172)
Motorbike	-0.1020	(0.153)			-0.2333	(0.180)
Bicycle	-0.0815	(0.060)	-0.0426	(0.088)	-0.2045	(0.100)**
Schooling			--			
HH Schooling	-0.0100	(0.009)	-0.0161	(0.014)	-0.0363	(0.015)**
Average Schooling	0.0081	(0.009)	-0.0149	(0.015)	0.0037	(0.015)
Ethnicity (0=Vietnamese Kinh)						
Chinese	-0.3825	(0.426)	--		-0.5102	(0.535)
Minorities	0.0602	(0.096)	0.1599	(0.131)	0.2277	(0.185)
Employment (0=agriculture)						
Skilled labor	0.4344	(0.196)**	0.9464	(0.377)**	0.1579	(0.259)
Unskilled labor	-0.1454	(0.153)	0.0000	(0.222)	-0.1866	(0.254)
Sales	0.2103	(0.391)	--		-0.4007	(0.447)
Professional work	0.1559	(0.164)	-0.4147	(0.469)	-0.0108	(0.211)
Other work	0.1171	(0.071)*	0.2291	(0.108)**	0.1033	(0.107)
Regions (0=Northern Uplands)						
Red River Delta	-0.0392	(0.104)	-0.0638	(0.150)	0.0146	(0.190)
North Central Coast	0.0588	(0.112)	0.1774	(0.155)	0.1261	(0.208)
South Central Coast	0.3203	(0.117)***	0.1763	(0.173)	0.2380	(0.205)
Central Highlands	-0.2219	(0.189)	-0.6098	(0.281)**	-0.2692	(0.331)
South East	-0.2066	(0.145)	-1.0548	(0.343)***	-0.3298	(0.224)
Mekong Delta	0.5844	(0.113)***	0.2747	(0.174)	0.5829	(0.192)***
Constant	-1.3726	(0.383)***	-1.6112	(0.568)***	0.1111	(0.642)

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Note: I consulted with writing tutors in writing workshop.