Poverty among ethnic minorities: transition process, inequality and economic growth

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Abstract

This paper investigates the process of reducing poverty in ethnic minority households. Using two recent Vietnam household surveys, we find that ethnic minority households are more likely to be persistently poor and less likely to be persistently non-poor than ethnic majority households. The within-group component generated by the variation in income within each ethnicity group explains more than 90 percent of the change in total inequality. Income redistribution plays an important role in decreasing the poverty gap and decreasing poverty severity. Different ethnic groups have different poverty patterns, which should be noted when designing policies to alleviate poverty and inequality.

Keywords: ethnic minority; household income; inequality; poverty; decomposition.

JEL Classifications: I31, I32, O12.

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I. Introduction

Issues of poverty among ethnic minorities with regard to ethnic differences in poverty rates have been central to policy debates and to the media not only in developing countries but also in developed nations. For example, in a speech in 2013[1], the President of the United States, Barack Obama, stated that income inequality is increasing in the United States. Minority workers are predicted to make up the majority of the American workforce in the future; however, their families currently struggle to break out of poverty[2]. Imai, Gaiha and Kang (2011) and the World Bank (2013) report that poverty among ethnic minorities is now a major poverty issue in Vietnam. This phenomenon has also been well documented in the academic literature. In the United Kingdom, all identified minority ethnic groups have higher rates of poverty than the average population (for example: Platt, 2002; Robson and Berthoud, 2006). Gradín (2012) shows that poverty rates among the two largest minorities in the United States are twice as high as that of non-Hispanic whites. Pager and Shepherd (2008) find that African Americans are twice as likely to be unemployed as whites and that the wages of both blacks and Hispanics are well below those of whites. Loury (1999) examines race-based social exclusion in the United States, showing that ethnicity may prevent the full participation of individuals in a society's economic life. Overall, poverty among ethnic minority groups is a global issue that needs to be addressed strategically.

Recent literature focuses on examining how the differences in geographic and economic characteristics explain the differences in welfare between the minority and majority (see: van de Walle and Gunewardena, 2001; Borooah, 2005; Gradín, 2012), noting that geographic characteristics matter to minorities' poverty status. Many policies target "ethnic minority areas" because minorities tend to concentrate in remote areas that lack basic

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[1] Source: http://www.npr.org/sections/thetwo-way/2013/12/04/248803175/income-inequality-challenge-of-our-time-obama-says

[2] Source: http://www.latimes.com/business/la-fi-working-poor-minorities-20150316-story.html

infrastructure. Hence, a natural question arises regarding whether ethnic minorities experience poverty reduction to the same degree as the majority, given the same geographic conditions.

This paper is the first to consider whether differences in poverty reduction processes exist between ethnic minorities and the ethnic majority, given the same geographic characteristics. To this end, our study utilizes two unique household surveys conducted in 2007 and 2012 in the poorest communes of Vietnam, which are home to the majority of Vietnam's ethnic minorities. The surveys cover 3515 representative households, including 3017 ethnic minority households living in upland and mountainous areas, which often have the worst access to public services and tough climate conditions. Both surveys use the same questionnaire and cover the same sample of households over the 2007-2012 period, allowing us to examine the poverty dynamics of ethnic minorities, which was not feasible for the existing literature using cross-sectional samples.

Furthermore, we examine how economic growth and income distribution contribute to poverty reduction among ethnic minorities. Economic growth is generally considered a primary factor of anti-poverty strategy (Demery and Squire, 1996; Ravallion and Chen, 1997; Dollar and Kraay, 2002). However, not all groups benefit equally from economic growth. The impact of economic growth on poverty reduction depends largely on how income distribution changes within a country. For a given rate of economic growth, poverty will decrease more quickly in countries where the income distribution becomes more equal than in countries where it becomes less equal (Ravallion, 2004). Inequality can be a detrimental factor to economic growth, thereby impeding poverty reduction (Alesina and Rodrik, 1994; Deininger and Squire, 1997; Levin and Bigsten, 2000). Improvement in the permanent redistribution of income reduces poverty instantaneously through a "distribution effect" and accelerates poverty reduction for a given rate of economic growth (see: Datt and Ravallion, 1992; Demery and Squire, 1996; Ravallion and Chen, 1997;

Ravallion, 2001; Dollar and Kraay, 2002; Bourguignon, 2003; Ravallion, 2004). Thus, understanding the effect of economic growth and inequality on poverty among minority groups – which are the poorest ethnicities – is important for policy makers in tackling income inequality among minority groups in particular and designing effective poverty reduction strategies in general.

Vietnam is a multi-ethnic country, containing 54 ethnic groups with their own languages, lifestyles and cultural heritage. The majority group, the "*Kinh*", accounts for more than 86% of the total population. The next largest groups are the "*Tay*", the "*Thai*", the "*Muong*", the "*Nung*", the "*H'mong*", and the "*Dao*", which together account for 10% of the total population (see: General Statistical Office (GSO), 2009). Ethnic minority groups, concentrated mostly in the upland and mountainous areas, have limited access to infrastructure, healthcare, and education (World Bank, 2009). Despite high economic growth in the last two decades, the poverty rate remains very high in mountain and highland areas, which are home to a large population of ethnic minorities. Ethnic minorities account for approximately 14 percent of the Vietnam's population and for 50 percent of the poor population.

Exploiting the unique feature of our dataset that covers a large number of the same ethnic minority households over time, we examine the differences in poverty dynamics among the minority and the majority using multinomial logit models. These dynamics are classified into four mutually exclusive categories: (1) persistently poor; (2) escaped poverty; (3) fell into poverty; and (4) persistently non-poor. Controlling for regions and various economics and households characteristics, we find that ethnic minorities have a higher probability of being persistently poor and a lower probability of being persistently non-poor than the *Kinh*. We also find that well-educated households tend to be persistently non-poor and that the reverse holds for low-educated households, which is consistent with Gustafsson and Sai (2009) and Kedir and McKay (2005). Though lack of endowment explains poverty among

ethnic minorities, surprisingly, our study finds that assets are sufficient neither to help households escape from poverty nor to drive them to fall into poverty. However, assets, measured by land area and remittances, are important for avoiding persistent poverty. Our findings contribute to the literature that indicates, given the same locations with similar infrastructure conditions, ethnic minority households lag behind their peers in the majority group in the poverty reduction process. Thus, policies targeting areas with high populations of ethnic minorities would not be efficient without focusing on ethnic minority households themselves.

We find that income inequality among all ethnicities in the sample increased from 2007 to 2012. Income disparity is lower for ethnic minorities than for the ethnic majority in both years. Decomposing the income inequality index into within-group and between-group ethnicities, we find that within-group inequality is the main source of income inequality for both ethnic groups in the 2007-2012 period, which is not dissimilar to the European literature (see: Brewer, Muriel and Wren-Lewis, 2010; Platt, 2011). A decomposition of the income inequality index by region also shows that disparity within regions contributes most to the total income inequality over time. These findings are consistent with our poverty analysis, which documents that while income redistribution within ethnic minorities contributes to poverty reduction, this effect is negligible. To further examine the effect of economic growth and inequality on poverty, we estimate the elasticity of three poverty indexes – the poverty headcount, the poverty gap and the squared poverty gap – with respect to inequality and income. We find that the poverty indexes of the ethnic minority are much less sensitive to both inequality and income than those of the *Kinh* and that the poverty gap and poverty severity are much more sensitive to inequality than the poverty headcount in both 2007 and 2012. These findings indicate that ethnic minority households, whose income is close to the poverty line, benefit most from economic growth and that a remarkable improvement in income redistribution

among ethnic minorities is imperative in order to raise the standards of living of all minority groups.

The remainder of this article proceeds as follows. In the next section, we briefly summarize the household survey data. Section III describes poverty and inequality patterns among households in the poorest areas of Vietnam. The methodological approach employed in this study is presented in Section IV. Section V reports our empirical results, and Section VI concludes.

II. Dataset

2.1 Data descriptions

The main data sources used in this study are the Baseline Survey (BLS) and the Endline Survey (ELS), which were conducted in 2007 and 2012, respectively. The BLS was conducted by the GSO, while the ELS was undertaken by Indochina Research & Consulting (IRC). Both surveys contain standardized questionnaires developed by the World Bank. Information was collected through face-to-face interviews with household heads, household members and key community officials and included information on demography, employment, labour force participation, education, health, income, expenditure, housing, fixed assets and durable goods, involvement in poverty alleviation programs, general economic conditions, agricultural production, local infrastructure and transportation and social problems. The sample in the two surveys covered 266 out of 1632 communes in Vietnam[3]. In

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[3] The criteria to identify the communes included in the sample focus on selecting those in which most ethnic minority households reside. More specifically, the sample contains communes that satisfy two conditions: *First*, they must lack at least 4 of 7 key items: roads suitable for cars to travel to central communes; at least 50% of agricultural land being irrigated; having a healthcare centre; the existence of a school; the existence of a market; the availability of electricity; and at least 50% of villages having access to clean water. *Second*,

each commune, one village was randomly selected, and in each selected village, 15 households were randomly selected for interviews. Finally, the two surveys covered 3515 representative households in the areas in which most ethnic minorities reside in Vietnam. Table 1 reports the composition of households in the sample by ethnic group. The sample includes 3017 ethnic minority households, which allows us to analyse the poverty and inequality patterns of ethnic minority groups.

[Insert Table 1 Here]

2.2 Measures of poverty and inequality

We measure the degree of poverty using three indexes developed by Foster et al. (1984), which can be written in their general form as follows:

$$P_\alpha = \frac{1}{n} \sum_{i=1}^{q} \left[\frac{z - Y_i}{z} \right]^\alpha , \qquad (1)$$

where Y_i denotes a welfare indicator for person i, z is the poverty line, n is the number of people in the sample, q is the total number of poor people, and α is a measure of inequality aversion. Different values of α provide different indexes. When $\alpha = 0$, the index measures the proportion of people who live below the poverty line (headcount index[4]); when $\alpha = 1$, the index represents the depth of poverty (poverty gap index), and when $\alpha = 2$, the index characterizes the squared poverty gap (poverty severity index). Welfare

the a commune-level poverty rate must be higher than 30% based on the poverty line for the year 2000 or higher than 55% based on the poverty line in 2006.

[4] In this paper, we use the terms "head count index" and "poverty rate" interchangeably.

indicators can be measured by either household income or expenditures. In this paper, we employ income per capita as a proxy for the welfare indicator.

Income inequality is measured by the following two indexes: the Gini coefficient and the Generalized Entropy (GE) index. The Gini coefficient, which is based on the Lorenz curve, is the most widely used measure of inequality due to its straightforward calculation, flexibility across different population groups and independence from sample size and economic scale. The Gini coefficient is estimated by the area between the Lorenz curve and the line of equality.

$$G = \frac{n+1}{n-1} - \frac{2}{n(n-1)\bar{\bar{Y}}} \sum_{i=1}^{n} \rho_i Y_i, \qquad (2)$$

where ρ_i is the rank of individual i by income. ρ_i is equal to 1 for the richest and increases for individuals with lower incomes. n is the total number of individuals in the sample. The Gini coefficient ranges from 0 to 1. As income inequality increases, the Gini coefficient increases.

We also measure household inequality by the GE index, which is calculated by a general formula as follows:

$$GE_{(\alpha)} = \frac{1}{\alpha(\alpha-1)} \left[\frac{1}{N} \sum_{i=1}^{n} \left(\frac{y_i}{\bar{y}} \right)^{\alpha} - 1 \right] \qquad (3)$$

where y_i denotes a welfare indicator for person i (measured by per capita income); $\bar{y}$ is the mean income per capita; α is the weight given to distances between incomes at different parts of the income distribution. For lower values of α, GE is more sensitive to changes in the lower tail of the income distribution. In contrast, for higher values of α, GE is more sensitive to changes in the upper tail of the income distribution. The three most common values of α are 0, 1, and 2. $GE(2)$, which is equal to half the squared

coefficient of variation, gives more weight to gaps in the upper tail of the distribution. $GE(1)$, known as the Theil's L, assigns equal weights to the dispersion of income across the distribution, while $GE(0)$, also known as Theil's T, gives more weight to distances between incomes in the lower tail. The values of GE measures vary between 0 and ∞, where a GE of zero indicates a perfectly equal distribution and higher values of GE represent higher levels of inequality[5].

III. Poverty trends in Vietnam

Using data from the two surveys, we calculate per capita income and the poverty rate[6] stratified by ethnicity and region. Table 2 shows that the per capita income of households in the sample significantly increased by 20 percent from VND 6,039 thousand in 2007 to VND 7,295 thousand in 2012. The ethnic majority has nearly twice the income of other ethnic minorities, which is consistent with findings of other studies on poverty in Vietnam (see, for example: van de Walle and Gunewardena, 2001; Baulch et al., 2007; World Bank, 2013).

[Insert Table 2 Here]

The poverty rate in the whole sample reduced from 57.5 percent in 2007 to 49.2 percent in 2012. Although the *Kinh* have a much lower poverty rate,

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[5] An advantage of the *GE* measure is that total inequality can be decomposed into an inequality component within groups and an inequality component due to income differences between groups.

[6] The poverty rate is the percentage of households with total income below the poverty line of VND 2,400 thousand per person per year at 2006 prices to total households in the sample.

the rate of poverty reduction of the *Kinh* is much lower than that of other ethnic minorities. Households in the North (the mountainous area), where more poor ethnic minorities such as the *Nung*, *Tay* and *H'Mong* reside, are poorer than those in the Central and the Southern regions.

Figure 1 plots the cumulative distribution of the per capita income of households in the sample and shows the poverty rate (on the vertical axis) at each level of the poverty line (indicated by the horizontal axis). The curve shows how the choice of the poverty line affects the poverty rate. The 2012 poverty incidence curve lies below the 2007 poverty incidence curve for all poverty lines, which shows the improvement in poverty eradication programs during the period. Additionally, poverty rates are very sensitive to the poverty line of less than VND 20,000 thousand per capita per year. At the poverty line of VND 5,000 thousand, the poverty ratios are 38 percent and 40 percent in 2007 and 2012, respectively. However, if the poverty line were to increase to VND 10,000, the ratios would be 72 percent and 80 percent, respectively.

[Insert Figure 1 Here]

We depict the poverty incidence curves for the *Kinh* and ethnic minority groups in 2007 and 2012 (see Figures A1 and A2 in the appendix). Again, the lower the height of poverty incidence curve in 2012 compared to that of 2007 reflects the effectiveness of poverty policy in both groups. In addition, the curve for the *Kinh* is flatter than that for the other ethnicity households, indicating that the poverty rates among ethnic minority households are more sensitive to the choice of poverty line than that of the *Kinh*. The effect of an increase in income on poverty reduction of ethnic minorities is much larger than that for the *Kinh*. This finding is consistent with the results in Table 2, an increase of VND 2,104 thousand (insignificantly) reduces the poverty rate of

2.3 percent among *Kinh* households. Meanwhile, an increase of VND 1,083 thousand generates (a significant) 10 percent drop in the poverty rate of ethnic minorities.

We also estimate the sensitivity of poverty indicators, which are measured by the poverty deficit and poverty severity indexes, to the choice of the poverty line (the results of the estimate are presented in Figures A3-A6 in the appendix). Figure A3 shows that to lift all the *Kinh* poor out of poverty, the minimum per capita income of society in 2012, if transferred to the poor, is less than that in 2007 at any poverty line. However, up to the poverty line of VND 45,000 thousand, society needs more income to bring ethnic minorities out of poverty in 2012 than in 2007 (see Figure A4). In addition, the poverty deficit curve of the *Kinh* is steeper than that of ethnic minority households, which implies that the poverty gap measures of the *Kinh* are more sensitive to the choice of poverty line than those for ethnic minority households. The poverty severity curve of the *Kinh* and that for other ethnic minorities show similar results (see Figures A5-A6 in the appendix).

Estimates of the poverty gap and poverty severity indexes are presented in Table 3. These ratios do not change significantly for the whole sample. The poverty gap among ethnic minorities decreases significantly from 26.5 percent in 2007 to 24.6 percent in 2012. Meanwhile, the ratio of the *Kinh* increases marginally from 11.7 percent to 13.3 percent, and there is no evidence that this increase is statistically significant. These findings are consistent with the finding in Table 2, indicating that the rate of poverty reduction of the *Kinh* is much lower than that for other ethnic minorities.

[Insert Table 3 Here]

By region, the poverty gap and poverty severity indexes in Northern Vietnam are statistically significantly reduced by 5.1 and 1.9 percent, respectively. These improvements in poverty indicators might be partly explained by the significant increase in per capita income in the 2007-2012 period (see Table 2). Despite the significant increase in per capita income in the Central area (see Table 2), poverty worsens according to all three indexes, indicating that the negative redistribution effect outweighs the positive income effect in this region.

Table 4 reports the distribution of the poor by ethnicity and region. Ethnic minorities account for 80.3 percent of the households in the sample and 87.8 percent of the poor in 2012. No significant difference exists between the proportions of both the ethnic majority and ethnic minorities in the population and in the classifications of the poor between 2007 and 2012. However, the proportions of poor households living in the Northern area significantly decrease by 5.1 percent, while the proportions of those living in the Central region of the country increase by 3.1% during the same period. Given that the shares of the population by each region are identical over the period, the variation in the poor distributions may indicate the efficiency of the anti-poverty policy of the provincial governments.

[Insert Table 4 Here]

IV. Methodology

The multinomial logit model of poverty dynamics

We model the poverty dynamics of minority households using a multinomial logit model because the processes involve in a single decision among several alternatives that cannot be ordered. We categorize the poverty transition into four mutually exclusive alternatives: (1) being poor in both 2007 and 2012, (2)

being poor in 2007 and non-poor in 2012, (3) being non-poor in 2007 and poor in 2012, and (4) being non-poor in both 2007 and 2012. These four poverty dynamics are called persistently poor, escaped poverty, fell into poverty, and persistently non-poor, respectively. The multinomial logit model determines the probability that a household i experiences one of the four j outcomes above. This probability is given by

$$\Pr(Y_i = j \mid X_i) = \frac{e^{X_i'\beta_j}}{\sum_{k=1}^{4} e^{X_i'\beta_k}}, \qquad j= 1,\ldots, 4 \qquad (4)$$

where X is a vector of household characteristics widely used as determinants of household income and expenditure in the literature. These control variables include the age of the household head, the ethnicity of household, the location of the household, household size, the proportion of dependency, the proportion of females, the wealth of the household, and so on. The detailed descriptions of these control variables are presented in Table A.1 in the appendix.

Since the probabilities in Equation (4) sum to one, only J parameter vectors are needed to determine the J+1 probabilities. Thus, following Greene (2008), we set the fourth category, "being non-poor in both 2007 and 2012", as the base category. The beta's coefficients of the base, then, equal zero. The probability function in Equation (4) becomes

$$\Pr(Y_i = j \mid X_i) = \frac{e^{X_i'\beta_j}}{1+\sum_{k=1}^{3} e^{X_i'\beta_k}} \qquad j= 1,\ldots,3 \qquad (5)$$

and

$$\Pr(Y_i = 4 \mid X_i) = \frac{1}{1+\sum_{k=1}^{3} e^{X_i'\beta_k}} \qquad (6)$$

Estimates of Equation (5) are presented in Table A.2 in the appendix.

Because the coefficients in the multinomial logit model contain limited economic significance, we calculate the marginal effect of the control variables on the probability that a household falls into one of the four outcomes. Specifically, the marginal effect can be measured as follows:

$$\frac{\partial P_{ij}}{\partial X_i} = \frac{e^{X_i\beta_j}}{\sum_{k=1}^{m} e^{X_i\beta_k}}\beta_j - \frac{e^{X_i\beta_j}}{\left(\sum_{k=1}^{m} e^{X_i\beta_k}\right)^2}\sum_{k=1}^{m} e^{X_i\beta_k}\beta_k$$
$$= P_{ij}\beta_j - P_{ij}\sum_{k=1}^{m} P_{ik}\beta_k. \tag{7}$$

Estimation results of Equation (7) are reported in Table 6.

Decomposition of income inequality

Average household income may differ between ethnic minority and majority groups, which implies inequality "between groups". In addition, household incomes vary within each ethnic minority/majority group, which represents the contribution of the within-group component to total inequality. For policy purposes, it is necessary to decompose the inequality indicator into "between-group" and "within-group" components to determine sources of inequality and to adjust policy focuses accordingly. In this paper, we decompose the GE indicator to evaluate the major contributors to inequality by ethnicity and by region (see Appendix 1 for details on the decomposition of the GE index).

Decomposition of the poverty index

Following Datt and Ravallion (1992), we decompose the change in poverty during a period into growth, redistribution, and residual components. The growth component of the poverty change from date t to date $t+n$ is defined as the change in poverty due to a change in the mean income (from $\overline{Y}_t$ at date t to $\overline{Y}_{t+n}$ at date $t+n$) while holding the income distribution (the Lorenz curve) constant. The redistribution component is the change in poverty due to

a change in the income distribution[7] from L_t at date t to L_{t+n} at date $t+n$ while keeping the mean income constant. More specifically, a change in poverty between dates t and $t + n$ is decomposed as follows:

$$P_{t+n} - P_t = G(t,t+n) + D(t,t+n) + R(t,t+n) \tag{8}$$

in which the growth and redistribution components are estimated as follows:

$$G(t,t+n) = P(z,\mu_{t+n},L_t) - P(z,\mu_t,L_t), \tag{9}$$

$$D(t,t+n) = P(z,\mu_t,L_{t+n}) - P(z,\mu_t,L_t) . \tag{10}$$

The residual can be interpreted as the difference between the growth (redistribution) components evaluated at the terminal and initial Lorenz curves (mean incomes) (see Datt and Ravallion (1992) for detail).

V. Estimation results

5.1 Poverty dynamics of ethnic minorities

Basically, chronically poor households are those whose living standards are below a defined poverty line for a period of several years, while the transiently poor experience some non-poverty years during the same period (Hulme and Shepherd, 2003). In this paper, we classify households into four mutually exclusive groups: (1) persistently poor, who were poor in both 2007 and 2012; (2) those escaping poverty, who were poor in 2007 but non-poor in 2012; (3) those falling into poverty, who were non-poor in 2007 but became poor in 2012; and (4) persistently poor, who were non-poor in both 2007 and 2012. Households who escaped from poverty and those who fell into poverty can be regarded as the transiently poor.

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[7] L_t is a vector of parameters that fully describe the Lorenz curve at date t.

Table 5 presents the proportion of households falling into the four poverty categories. Overall, 35 percent of households were poor in both years. A large proportion of households were in transient poverty; 22.1 percent of households escaped poverty, while 14.3 percent fell into poverty. Ethnic minority households are much poorer than the *Kinh*. Therefore, it is expected that ethnic minority groups are more likely to be persistently poor and less likely to be persistently non-poor than the *Kinh*. It is surprising that the proportion of the *Kinh* who fell into poverty was higher than that of minorities (15.3 percent compared to 14 percent), while the proportion of the *Kinh* escaping poverty was lower. This finding is consistent with Table 2, confirming the hypothesis that the poverty rate of the ethnic minority decreased greatly during the period.

By region, while the Northern area, home to most ethnic minorities, has the highest proportion of persistently poor households (39.2), it also has largest percentage of households who escaped poverty in 2012 (24.7). The Central and South of Vietnam have large portions of persistently non-poor households, which is consistent with the findings about the poverty gap by demographics in the early section of the paper.

[Insert Table 5 Here]

Table 6 reports the marginal effects of explanatory variables on the probability of households falling into one of the four poverty statuses. The age of the household head has an effect on chronic poverty, as expected. Specifically, households with a young or an old household head are more

likely to fall into persistent poverty[8]. Households with middle-age heads have the lowest probability of being persistently poor. The link between the age of the household head and poverty can be explained as follows: when a household head grows older (but remains in the working age) with more experience, accumulated capital and a greater labour supply (including less childcare duty due to their older-aged children), the household is typically associated with a lower probability of poverty. Households with female heads have a 0.1032 lower probability of being persistently poor than those with male heads. The number of schooling years of the household head is positively correlated with the probability of being persistently non-poor (0.0357) and negatively correlated with the probability of being persistently poor (-0.0305), indicating that households with better-educated heads tend to be persistently non-poor, while the reverse occurs for households with low-educated heads. Households with a large size and a high proportion of children and elderly are more likely to be persistently poor. On the contrary, persistently non-poor households tend to have a lower household size and a lower proportion of children.

[Insert Table 6 Here]

Interestingly, the table shows that assets are important for avoiding being persistently poor. Households with larger living areas, croplands, and remittances are less likely to be persistently poor. However, these assets are sufficient neither to help households escape from poverty nor to allow them to fall into poverty, as indicated by negative coefficients and positive coefficients

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[8] The lowest probability of being persistently poor is found among households in which the age of the household head equals 45. The highest probability of being persistently non-poor is found among households in which the age of the household head equals 55.

of these control variables in the "escaped poverty" and the "fell into poverty" regressions, respectively.

Our results provide evidence that anti-poverty policies that focus on "ethnic minority areas" seem to benefit the majority rather than the minority in the area. Thus, an effective policy should focus on minority households themselves. In addition, our finding suggests that anti-poverty policies should be implemented along with better education, and more attention should be paid to young and old families, especially among ethnic minorities.

5.2 Inequality analysis

Table 7 presents the estimates of the Gini coefficients and ratios of different percentiles based on the per capita income distribution. Income inequality measured by the Gini index increases sharply over the period, from 43.0 in 2007 to 47.0 in 2012, for the whole sample (see the last column)[9]. The same patterns are documented for the two ethnic groups in the 2007-2012 period. The Gini index is 42.77 (in 2007) and 45.43 (in 2012) for the *Kinh*; these figures are higher than those for the ethnic minority, indicating that inequality among ethnic minorities is lower than among the majority group (*Kinh)*.

[Insert Table 7 Here]

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[9] The Gini index is higher than the estimate for the whole country's level of 38.7 in 2012, as calculated by the World Bank http://data.worldbank.org/indicator/SI.POV.GINI. This finding reflects that income inequality among households in poor areas is higher than the average country level.

We also estimate percentile ratios to measure the spread of incomes across the sample. The $p25/p10$[10] is 1.76 in 2012, indicating that the per capita income of households at the 25th percentile is 1.76 times as great as the income of households at the 10th percentile. The percentile ratios in Table 7 show that most of the income percentile ratios increased over the period for the entire sample and the two ethnic groups. Exceptions include small decreases in the p90/p75 ratios for the whole sample and for the *Kinh*. In line with the Gini index, these results suggest that income inequality increase over the 2007-2012 period for both ethnic groups.

Estimates of household income distribution are plotted in Figure 2. The Lorenz curve in 2012 becomes more distant from the diagonal line than in 2007, indicating that the income share of every cumulative population in 2007 is higher than that in 2012. This finding is consistent with the results reported in Table 7, which confirms that income distribution worsens over the period. The Lorenz curves for the *Kinh* and minority households have the same pattern, which shows that there is no significant difference in income inequality patterns between ethnic minorities and the *Kinh* (see Figure A7 and A8 in the appendix).

[Insert Figure 2 Here]

Table 8 presents the *GE* indexes and their decomposition into within-group and between-group components by ethnicity. The *GE* index in a given value of the three values of alpha increase from 2007 to 2012 for the full sample and for each ethnic group, confirming the hypothesis that income

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[10] pk/pl is estimated as the income per capita of household at the kth percentile (those earning more than k percent of other households) divided by the income per capita of household at the lth percentile (those earning higher than the bottom l percent).

inequality worsens over the period. The decomposition of the *GE* index by ethnicity shows that a large proportion of total inequality is explained by within-group inequality. Between-group inequality explains less than 10 percent of the variation in the total inequality in all inequality measures (see the last row). Our findings imply that the source of income inequality between 2007 and 2012 was due mainly to the adverse change in income distribution within each ethnic group. This finding is consistent with Brewer, Muriel and Wren-Lewis (2010) and Platt (2011), who find that income inequality in the UK is explained largely by within-group, rather than between-group, inequality by ethnicity.

[Insert Table 8 Here]

The decomposition of inequality by region presented in Table 9 shows that income inequality increases in all three regions and that inequality within regions contributes most to total income inequality. The between-group component explains less than 7.4 percent of the change in total inequality in 2007. The contribution of this component decreases in 2012 to less than 3.2 percent of total income inequality. With the addition of the increase in total inequality in 2012, as indicated by a higher *GE* than that in 2007, there is a significantly higher income gap among households in the same region between 2007 and 2012.

[Insert Table 9 Here]

5.3 Contribution of growth and redistribution to poverty reduction

Table 10 reports the decomposition of the change in the incidence of poverty overtime into three sources: (1) income growth, (2) income redistribution, and (3) the residual. The growth component of a change in the poverty measure from 2007 to 2012 is defined as the poverty change due to a change in the mean income from 2007 to 2012, while holding the income distribution (the Lorenz curve) unchanged. The redistribution component is the change in poverty due to a change in the income distribution from 2007 to 2012, keeping the mean income fixed at the base year. The difference between the total change in poverty and the change in poverty due to income growth and income redistribution is called the residual.

[Insert Table 10 Here]

The table shows that total poverty reduction of all households in the sample is achieved mainly by income growth (-10.56). Inequality increases, thereby slightly raising the poverty incidence (0.49). Within ethnic minority households and within the *Kinh*, income growth contributes mainly to poverty reduction (-10.38 and -12.04, respectively). However, income redistribution displays opposite effects on poverty for the ethnic majority (5.77) and for the full sample (0.49). Although total inequality within ethnic minority households increases (see Tables 5 and 6), income distribution contributes to the poverty reduction, even though this contribution is negligible (-1.02). Our results suggest that ethnic minority households, whose income is close to the poverty line, benefit most from economic growth.

Table 11 presents the elasticity of the poverty rate with respect to the mean income and inequality (as measured by the Gini coefficient). The elasticity of income is computed in two steps: first, per capita income of all

households is shifted by a fixed amount and the new poverty indexes are estimated; second, elasticity is estimated using the percentage change in the poverty indexes scaled by the percentage change in the mean income. The elasticity to Gini (inequality) is estimated by increasing the per capita incomes of all households by the same fixed transferred income level and normalizing them to bring the new mean level of income to the old mean level.

[Insert Table 11 Here]

Table 11 shows that a one-percent increase in income leads to 0.79 percent and 0.89 percent reductions in the poverty headcount in minority households in 2007 and 2012, respectively. The income elasticity of the poverty headcount in ethnic minority households in 2012 is higher than that of the *Kinh*, showing that the higher income growth of the *Kinh* than that of ethnic minorities is required to achieve a similar reduction in the poverty rate. The poverty gap and the squared poverty gap are more sensitive to changes in income for both the *Kinh* and ethnic minorities. However, in 2012, both poverty indexes are less sensitive to income, indicating that higher income is expected to attain a similar reduction in the poverty gap and the squared poverty gap in 2007.

The elasticity of poverty indexes to inequality, as measured by the Gini inequality index, shows that a one-percent decrease in the Gini results in a 0.31 percent reduction in the poverty headcount of minority groups in 2012. The poverty indexes of the *Kinh* are much more sensitive to the change in inequality than those for ethnic minorities, indicating that a greater reduction in income inequality within minority groups is required to achieve a similar anti-poverty policy goal to that of the *Kinh*. The elasticity of the poverty gap and poverty severity to inequality is much higher than that of the poverty

headcount in both years, suggesting that income redistribution plays a decisive role in decreasing the poverty gap and poverty severity.

VI. Conclusions

Using the most recent surveys on the poorest areas of Vietnam, which are home to many ethnic minority households, this article aims to answer two research questions: (1) Are differences in poverty transition processes significant between the ethnic majority and ethnic minorities, given equal access to basic infrastructure and public services? And (2) How do income redistribution and economic growths contribute to poverty reduction among ethnic minority groups? The decomposition method is used to distinguish the growth and distribution effects. We then augment a standard multinomial logit model to investigate the marginal effect of a wide range of household characteristics on the likelihood of falling into one of four poverty statuses.

We find that ethnic minority households are more likely to be persistently poor and less likely to be persistently non-poor than the majority *Kinh* when controlling for household age, gender, education, physical possessions and living location. Our findings support that of van de Walle and Gunewardena (2001) that anti-poverty models applied to the ethnic majority may not work well for ethnic minorities.

Poverty in these areas seems to improve, as indicated by a decrease in poverty incidence from 57.5 percent to 49.2 percent during the 2007-2012 period. However, the poverty gap and severity indexes of households remain unchanged. Income inequality within ethnic majority *Kinh* and ethnic minority households increase during the period, which explains a large proportion of the variation in the total inequality. The between-group inequality component accounts for less than 10 percent of total inequality for all ethnicities.

Using the decomposition analysis, we find that poverty reduces among households in the sample as a result of income growth. Inequality increases, which slightly raises poverty incidence. The sensitivity of poverty to economic growth tends to decrease overtime. The results of our analysis imply that to reduce the poverty gap and poverty severity, policy makers should pay more attention to income redistribution.

In conclusion, our paper shows that different ethnic groups have different poverty patterns and that the income redistribution component makes a significant contribution to alleviating poverty within ethic minority groups in the long run. Our paper also takes into account different characteristics of ethnicities and documents various factors that affect poverty dynamics. Our findings recommend that when designing policies to alleviate poverty and inequality, policy makers should consider the effects on each ethnic minority group to redistribute incomes within groups and to provide additional support for the youngest and oldest families.

References

Alesina, Alberto, and Dani Rodrik. 1994. "Distributive Politics and Economic-Growth." *Quarterly Journal of Economics*, 109(2), 465-90.

Baulch, Bob, Truong Thi Kim Chuyen, Dominique Haughton, and Jonathan Haughton. 2007. "Ethnic Minority Development in Vietnam." *Journal of Development Studies*, 43(7), 1151-76.

Borooah, Vani K. 2005. Caste, inequality, and poverty in india, *Review of Development Economics* 9(3), 399-414

Bourguignon, François. 2003. "The Growth Elasticity of Poverty Reduction; Explaining Heterogeneity across Countries and Time Periods," in T. Eicher and S. Turnovsky, *Inequality and Growth: Theory and Policy Implications.* Cambridge: The MIT Press.

Brewer, Mike, Alastair Muriel, and Liam Wren-Lewis. 2010. *Accounting for Changes in Inequality since 1968: Decomposition Analyses for Great Britain*. London: Institute for Fiscal Studies.

Datt, Gaurav, and Martin Ravallion. 1992. "Growth and Redistribution Components of Changes in Poverty Measures: A Decomposition with Applications to Brazil and India in the 1980s." *Journal of Development Economics*, 38(2), 275-95.

Deininger, Klaus, and Lyn Squire. 1997. "Economic Growth and Income Inequality: Reexamining the Links " *Finance and Development*, March.

Demery, Lionel, and Lyn Squire. 1996. " Macroeconomic Adjustment and Poverty in Africa an Emerging Picture " *World Bank Research Observer*, 11(1), 39-59.

Dollar, D., and A. Kraay. 2002. "Growth Is Good for the Poor." *Journal of Economic Growth*, 7(3), 195-225.

Foster, James, Joel Greer, and Erik Thorbecke. 1984. A class of decomposable poverty measures, *Econometrica* 52(3), 761-766

General Statistical Office (GSO). 2009. *Population and Housing Census Vietnam 2009*. Hanoi: Statistical Publishing House.

Gradín, Carlos. 2012. "Poverty among Minorities in the United States: Explaining the Racial Poverty Gap for Blacks and Latinos." *Applied Economics*, 44(29), 3793-804.

Greene, William H. 2008. *Econometric Analysis*. Upper Saddle River, N.J.: Pearson/Prentice Hall.

Gustafsson, Björn, and Ding Sai. 2009. "Temporary and Persistent Poverty among Ethnic Minorities and the Majority in Rural China." *Review of Income and Wealth*, 55, 588-606.

Hulme, David, and Andrew Shepherd. 2003. "Conceptualizing Chronic Poverty." *World Development*, 31(3), 403-23.

Imai, Katsushi, Raghav Gaiha, and Woojin Kang. 2011. "Poverty, Inequality and Ethnic Minorities in Vietnam." *International Review of Applied Economics*, 25(3), 249-82.

Kedir, Abbi M., and Andrew McKay. 2005. "Chronic Poverty in Urban Ethiopia: Panel Data Evidence." *International Planning Studies*, 10(1), 49-67.

Levin, Jörgen, and Arne Bigsten. 2000. "Growth, Income Distribution, and Poverty: A Review." Working Papers in Economics, No32, Göteborg University.

Loury, Glenn C. 1999. "Social Exclusion and Ethnic Groups: The Challenge to Economics." Paper presented at The Annual World Bank Conference on Development Economics, Washington, DC.

Pager, Devah, and Hana Shepherd. 2008. "The Sociology of Discrimination: Racial Discrimination in Employment, Housing, Credit, and Consumer Markets." *Annual Review of Sociolgy*, 34, 181-209.

Platt, Lucinda. 2011. *Inequality within Ethnic Groups*. United Kingdom: Joseph Rowntree Foundation.

____. 2002. *Parallel Lives? Poverty among Ethnic Minority Groups in Britain*. London, UK: Child Poverty Action Group.

Ravallion, M. 2001. "Growth, Inequality and Poverty: Looking Beyond Averages." *World Development*, 29(11), 1803-15.

Ravallion, Martin. 2004. "Pro-Poor Growth: A Primer." World Bank Policy Research Working Paper No. 3242.

Ravallion, Martin, and Shaohua Chen. 1997. "What Can New Survey Data Tell Us About Recent Changes in Distribution and Poverty?" *The World Bank Economic Review*, 11(2), 357-82.

Robson, Karen, and Richard Berthoud. 2006. "Age at First Birth and Disadvantage among Ethnic Groups in Britain." *Ethnic and Racial Studies*, 29(1), 153-72.

van de Walle, Dominique, and Dileni Gunewardena. 2001. "Sources of Ethnic Inequality in Viet Nam." *Journal of Development Economics*, 65(1), 177-207.

World Bank. 2013. *2012 Vietnam Poverty Assessment: Well Begun, Not yet Done - Vietnam's Remarkable Progress on Poverty Reduction and the Emerging Challenges*. Washington, D.C.: World Bank.

____. 2009. *Country Social Analysis: Ethnicity and Development in Vietnam*. Washington, D.C.: Social Development Unit, East Asia and Pacific Region.

Figure 1: Poverty incidence curve
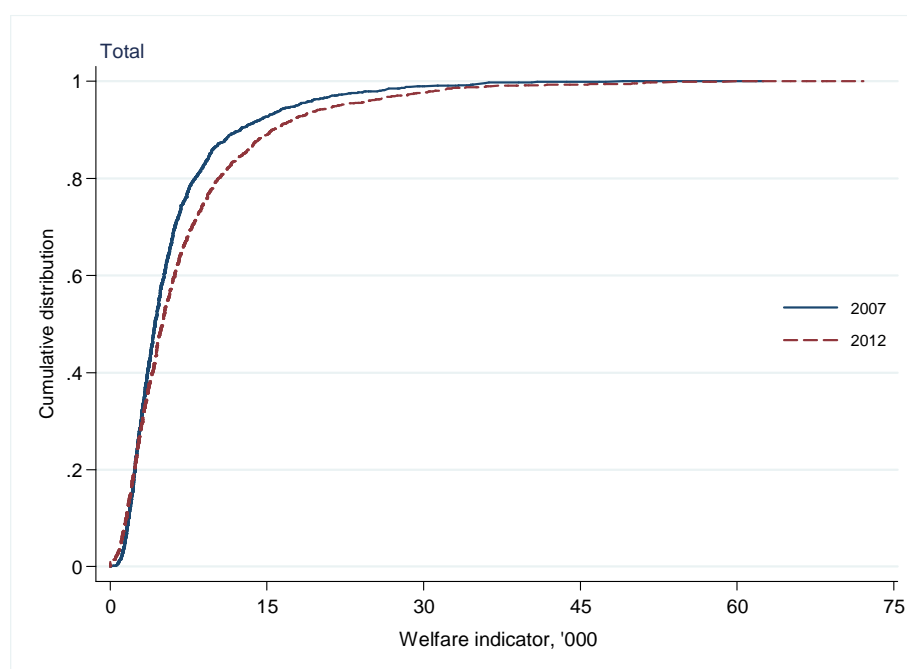
Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Note: Welfare indicator is measured by income (thousand VND/person/year).

Figure 2. Lorenz curves in 2007 and 2012
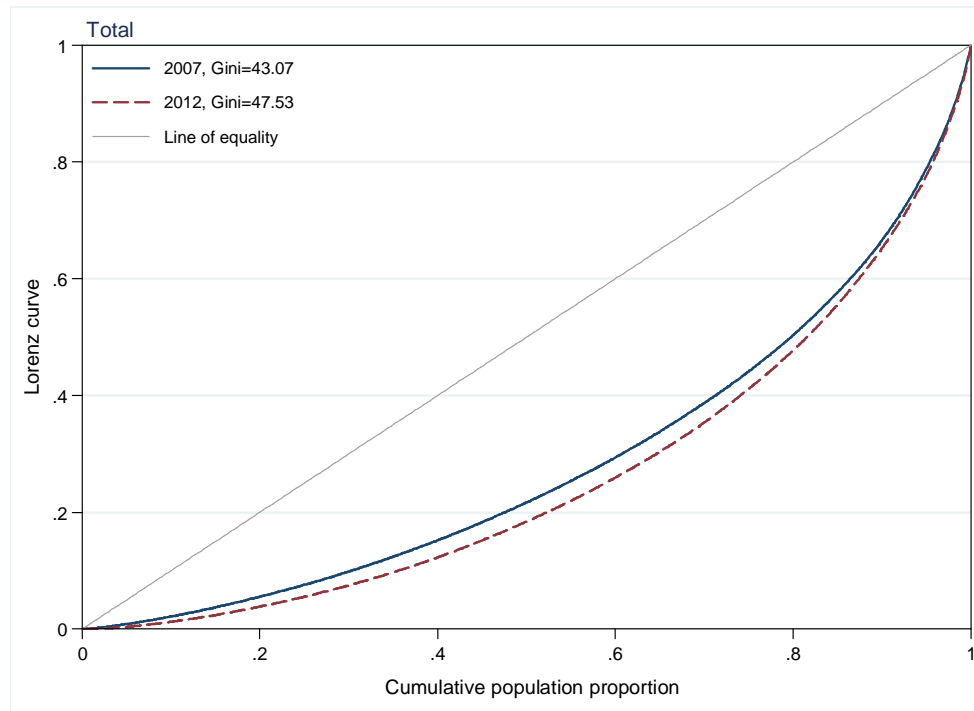
Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Table 1: Sample Distribution of Households by Ethnic Groups

Groups	Observations	Percentage	Cum. Percentage
Kinh	498	14.17	14.17
Tay	392	11.15	25.32
Thai	341	9.7	35.02
Muong	237	6.74	41.76
Nung	192	5.46	47.23
H'mong	632	17.98	65.21
Dao	415	11.81	77.01
Other	808	22.99	100.00
Total	3,515	100	

Source: Estimation based on the surveys BLS 2007 and ELS 2012.

Table 2: Per capita income and the poverty rate of households

Groups	Per capita income (thousand VND)			Poverty rate (%)		
	2007	2012	Diff	2007	2012	Diff
All households	6,039.2	7,294.6	1,255.4***	57.5	49.2	-8.2***
	(180.3)	(193.5)	(264.5)	(1.3)	(1.3)	(1.8)
By Ethnicity						
Kinh	9,273.6	11,377.7	2,104.2**	34.3	32.0	-2.3
	(659.4)	(716.2)	(973.1)	(3.7)	(4.0)	(5.4)
Ethnic minorities	5,210.4	6,293.7	1,083.3***	63.4	53.5	-10.0***
	(140.3)	(169.7)	(220.2)	(1.3)	(1.3)	(1.8)
By Region						
North	5,083.7	6,551.1	1,467.3***	65.2	50.7	-14.6***
	(118.4)	(152.3)	(192.9)	(1.3)	(1.4)	(1.9)
Central	6,131.5	7,283.9	1,152.5***	56.1	54.3	-1.8
	(233.9)	(331.4)	(405.5)	(2.0)	(2.0)	(2.9)
South	8,712.6	9,608.3	895.7	36.7	38.2	1.5
	(776.2)	(824.6)	(1,131.2)	(4.7)	(4.7)	(6.6)

Source: Estimation based on the surveys BLS 2007 and ELS 2012.

Notes: Per capita income is measured using the January 2012 price.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Figures in parentheses are SEs, which are found using bootstrap (nonparametric) estimations with 500 replications.

Table 3: Poverty gap and severity indexes by demographics and regions

Groups	Poverty gap index (%)			Poverty severity index (%)		
	2007	2012	Diff	2007	2012	Diff
All households	23.5	22.4	-1.1	12.5	13.4	0.9
	(0.7)	(0.8)	(1.0)	(0.4)	(0.6)	(0.8)
By Ethnicity						
Kinh	11.7	13.3	1.5	6.0	8.0	2.1
	(1.5)	(2.3)	(2.7)	(0.8)	(2.0)	(2.2)
Ethnic minorities	26.5	24.6	-1.9[*]	14.2	14.7	0.5
	(0.7)	(0.8)	(1.1)	(0.5)	(0.6)	(0.8)
By Region						
North	27.1	22.0	-5.1[***]	14.4	12.5	-1.9[**]
	(0.8)	(0.8)	(1.1)	(0.5)	(0.6)	(0.8)
Central	23.5	27.3	3.8[**]	12.7	17.5	4.7[***]
	(1.1)	(1.3)	(1.7)	(0.8)	(1.0)	(1.3)
South	12.9	17.0	4.0	6.8	10.8	4.0
	(1.9)	(3.0)	(3.6)	(1.2)	(2.7)	(2.9)

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Notes: [*] significant at 10%; [**] significant at 5%; [***] significant at 1%.

Figures in brackets are SEs. SEs are found using bootstrap (nonparametric) estimations with 500 replications.

Table 4: Distribution of the poor by ethnicity and region

Groups	Share of the poor (%)			Share of the population (%)		
	2007	2012	Diff	2007	2012	Diff
By Ethnicity						
Kinh	12.2	12.8	0.6	20.4	19.7	-0.7
	(1.54)	(1.85)	(2.41)	(1.30)	(1.27)	(1.82)
Ethnic minorities	87.8	87.2	-0.6	79.6	80.3	0.7
	(1.54)	(1.85)	(2.41)	(1.30)	(1.27)	(1.82)
By Region						
North	63.9	58.8	-5.1[*]	56.3	57.1	0.8
	(1.76)	(1.93)	(2.61)	(1.35)	(1.33)	(1.90)
Central	23.8	26.9	3.1[*]	24.4	24.4	0.0
	(1.22)	(1.44)	(1.88)	(0.95)	(0.95)	(1.34)
South	12.3	14.3	2.0	19.3	18.5	-0.8
	(1.83)	(2.08)	(2.77)	(1.50)	(1.43)	(2.08)
Total	100.0	100.0	-	100.0	100.0	-

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Notes: [*] significant at 10%; [**] significant at 5%; [***] significant at 1%.

Figures in parentheses are SEs, which are found using bootstrap (nonparametric) estimates with 500 replications.

Table 5: Poverty transition during 2007-2012

Groups	Persistently poor	Escaped poverty	Fell into poverty	Persistently non-poor
All households	35.0	22.1	14.3	28.6
	(1.2)	(1.0)	(1.0)	(1.2)
By Ethnicity				
Ethnic majority	16.7	18.1	15.3	49.9
	(3.2)	(2.9)	(3.3)	(3.8)
Ethnic minorities	39.5	23.1	14.0	23.4
	(1.3)	(1.1)	(0.9)	(1.1)
By Region				
North	39.2	24.7	11.5	24.6
	(1.4)	(1.3)	(0.9)	(1.2)
Central	37.7	18.7	16.5	27.0
	(2.0)	(1.6)	(1.6)	(1.8)
South	18.3	18.4	19.9	43.3
	(4.0)	(3.5)	(3.9)	(4.5)

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Notes: Figures in parentheses are SEs, which are found using bootstrap (nonparametric) estimates with 500 replications.

Table 6: Marginal effect of household characteristics on poverty status

Explanatory variables	Persistently poor	Escaped poverty	Fell into poverty	Persistently non-poor
Ethnic minority	0.0787*	0.0401	0.0282	-0.1470**
	(0.0465)	(0.0352)	(0.0284)	(0.0677)
Age of household head	-0.0182***	-0.0059	0.0018	0.0222***
	(0.0059)	(0.0065)	(0.0049)	(0.0075)
Age of household head squared	0.0002**	0.0001	-0.0000	-0.0002***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Head is male	0.1030**	-0.0007	-0.0124	-0.0899
	(0.0413)	(0.0529)	(0.0323)	(0.0658)
Schooling years of household head	-0.0287***	-0.0099***	0.0001	0.0386***
	(0.0037)	(0.0037)	(0.0033)	(0.0042)
Central	-0.0595*	-0.0661*	0.1084***	0.0172
	(0.0359)	(0.0341)	(0.0402)	(0.0485)
South	-0.1458***	-0.0914**	0.1103***	0.1269**
	(0.0462)	(0.0452)	(0.0370)	(0.0649)
Household size	0.0399***	0.0084	-0.0177***	-0.0307***
	(0.0076)	(0.0090)	(0.0067)	(0.0116)
Proportion of children	0.2864***	0.0378	-0.1238**	-0.2005***
	(0.1084)	(0.0650)	(0.0622)	(0.0720)
Proportion of elderly	0.2538***	-0.1998*	-0.0285	-0.0255
	(0.0898)	(0.1138)	(0.0806)	(0.1052)
Proportion of female members	0.0836	-0.0081	-0.0694	-0.0061
	(0.0728)	(0.0703)	(0.0508)	(0.0929)
Per capita living area (m2)	-0.0073***	-0.0051*	0.0036**	0.0088***
	(0.0027)	(0.0027)	(0.0015)	(0.0024)
Per capita annual crop land (ha)	-0.1219***	-0.0670***	0.0554***	0.1335***
	(0.0245)	(0.0189)	(0.0158)	(0.0229)
Per capita perennial crop land (ha)	-0.0115	0.0003	-0.0071	0.0183
	(0.0166)	(0.0092)	(0.0101)	(0.0138)
Receiving remittances	-0.1357***	-0.0060	0.0218	0.1199***
	(0.0460)	(0.0460)	(0.0260)	(0.0459)
Receiving allowances	0.0470	-0.0483	-0.0272	0.0284
	(0.0393)	(0.0318)	(0.0246)	(0.0464)
Borrowing from social bank	-0.0000	0.0119	0.0426*	-0.0544
	(0.0287)	(0.0249)	(0.0225)	(0.0400)
Observations	3,515	3,515	3,515	3,515

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Notes: *significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Figures in parentheses are SEs, which are found using bootstrap (nonparametric) estimates with 500 replications.

Table 7: Inequality in the income distribution of households by ethnic group

	Bottom half of the Distribution		Upper half of the Distribution		Interquartile Range	Tails	Gini
	p25/p10	p50/p25	p75/p50	p90/p75	p75/p25	p90/p10	
All							
2007	1.51	1.64	1.64	1.78	2.68	7.22	43.00
	(0.04)	(0.03)	(0.04)	(0.08)	(0.09)	(0.43)	(1.45)
2012	1.76	1.88	1.81	1.73	3.40	10.34	47.03
	(0.07)	(0.05)	(0.05)	(0.06)	(0.12)	(0.59)	(1.21)
Kinh							
2007	1.79	1.37	1.93	1.78	2.64	8.38	42.77
	(0.11)	(0.10)	(0.14)	(0.14)	(0.28)	(1.04)	(3.07)
2012	1.89	1.82	1.90	1.73	3.45	11.25	45.43
	(0.24)	(0.20)	(0.15)	(0.14)	(0.35)	(2.11)	(2.93)
Ethnic minorities							
2007	1.46	1.60	1.62	1.55	2.58	5.84	40.30
	(0.04)	(0.03)	(0.04)	(0.04)	(0.08)	(0.23)	(1.38)
2012	1.72	1.83	1.72	1.68	3.16	9.14	44.91
	(0.06)	(0.05)	(0.05)	(0.05)	(0.11)	(0.46)	(1.30)

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Notes: Figures in parentheses are SEs, which are found using bootstrap (nonparametric) estimations with 500 replications.

Table 8: Decomposition of inequality by ethnicity

	2007			2012		
	GE(0)	*GE*(1)	*GE*(2)	*GE*(0)	*GE*(1)	*GE*(2)
All sample	31.1	32.8	46.6	40.0	38.6	53.8
Kinh	31.4	30.7	38.4	37.8	34.7	42.8
Ethnic minorities	27.2	28.9	41.2	36.5	35.2	48.7
Decomposition of inequality by ethnicity						
Within-group	28.1	29.5	42.9	36.7	35.0	49.8
Between-group	3.0	3.3	3.7	3.3	3.6	4.1
Between as a share of total (%)	9.7	10.1	7.9	8.1	9.3	7.5

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Table 9: Decomposition of inequality by region

	2007			2012		
	GE(0)	*GE*(1)	*GE*(2)	*GE*(0)	*GE*(1)	*GE*(2)
All Regions	31.1	32.8	46.6	40.0	38.6	53.8
North	26.8	29.0	41.8	33.8	33.2	45.8
Central	31.1	32.1	45.7	50.6	47.7	69.5
South	31.6	31.1	39.3	38.2	35.6	44.3
Decomposition of inequality by region						
Within-group	28.8	30.4	44.0	38.7	37.3	52.4
Between-group	2.3	2.4	2.6	1.3	1.3	1.4
Between-group as a share of total	7.3	7.4	5.6	3.2	3.5	2.7

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Table 10: Growth and redistribution decomposition of poverty changes

	Incidence of poverty (%)			Explained by		
	2007	2012	Diff	Growth	Redistribution	Residual
Total	57.50	49.25	-8.25	-10.56	0.49	1.83
Kinh	34.29	31.98	-2.31	-12.04	5.77	3.96
Ethnic minorities	63.45	53.48	-9.96	-10.38	-1.02	1.44

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Table 11: Growth and inequality elasticity of poverty indexes

Indicators	2007		2012	
	Growth	Inequality	Growth	Inequality
Poverty Headcount				
Ethnic minorities	-0.79	0.05	-0.89	0.31
Kinh	-2.56	2.65	-0.81	2.8
Full sample	-1.00	0.27	-0.88	0.61
Poverty Gap				
Ethnic minorities	-1.30	1.18	-1.08	1.64
Kinh	-1.62	3.32	-1.28	3.8
Full sample	-1.33	1.59	-1.10	2.08
Squared Poverty Gap				
Ethnic minorities	-1.58	2.14	-1.22	2.76
Kinh	-1.69	4.65	-1.16	5.21
Full sample	-1.59	2.70	-1.22	3.32

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.

Appendices

Appendix 1: Decomposition of GE indicators

The Generalized entropy (GE) inequality formula is given by

$$GE_{(\alpha)} = \frac{1}{\alpha(\alpha-1)}\left[\frac{1}{N}\sum_{i=1}^{n}\left(\frac{y_i}{\bar{y}}\right)^{\alpha} - 1\right],\tag{1}$$

where y_i denotes the per capita income of household i; $\bar{y}$ is the arithmetic mean of per capita income; N is the number of individuals in the sample; α is a parameter that can take any real value and that represents the weight given to distances between incomes at different parts of the income distribution. The three most common values of α are 0, 1, and 2, and their associated value of GE can be written as follows:

$$GE(0) = \frac{1}{N}\sum_{i=1}^{N}\ln\left(\frac{\bar{y}}{y_i}\right)\tag{2}$$

$$GE(1) = \frac{1}{N}\sum_{i=1}^{N}\frac{y_i}{\bar{y}}\ln\left(\frac{y_i}{\bar{y}}\right)\tag{3}$$

$$GE(2) = \frac{1}{2}\left[\frac{1}{N}\sum_{i=1}^{N}\ln\left(\frac{y_i}{\bar{y}}\right)^{2} - 1\right]\tag{4}$$

These inequality indicators can be decomposed to assess the major contributors to inequality according to different subgroups of the population. For example, average income may vary between ethnic groups, which implies "between-group" inequality. Incomes may also vary within each ethnic group,

adding a "within-group" component of total inequality. Thus, the *GE* class of indicators can be decomposed as follows:

$$GE_\alpha = \sum_{k=1}^{m} \left(\frac{\overline{y}_k}{\overline{y}} \right)^\alpha \left(\frac{n_k}{N} \right)^{1-\alpha} GE(\alpha)_i + \frac{1}{\alpha(1-\alpha)} \left[\sum_{k=1}^{m} \frac{n_k}{N} \left(\frac{\overline{y}_k}{\overline{y}} \right)^\alpha - 1 \right] \qquad (5)$$

where $\overline{y}_k$ is the sub-group mean and $GE(\alpha)_i$ is the *GE* index of the ith subgroup. The first term in Equation 5 is the weighted average of the indexes of each group $GE(\alpha)_i$ with weights represented by the total income share, giving the within part of the decomposition. The second term is the $GE(\alpha)$ index calculated using the subgroup means $\overline{y}_k$ instead of actual income, which is the between part of the decomposition, as it reflects the variability only among groups and not within them.

Figure A.1. Poverty incidence curve of the *Kinh*
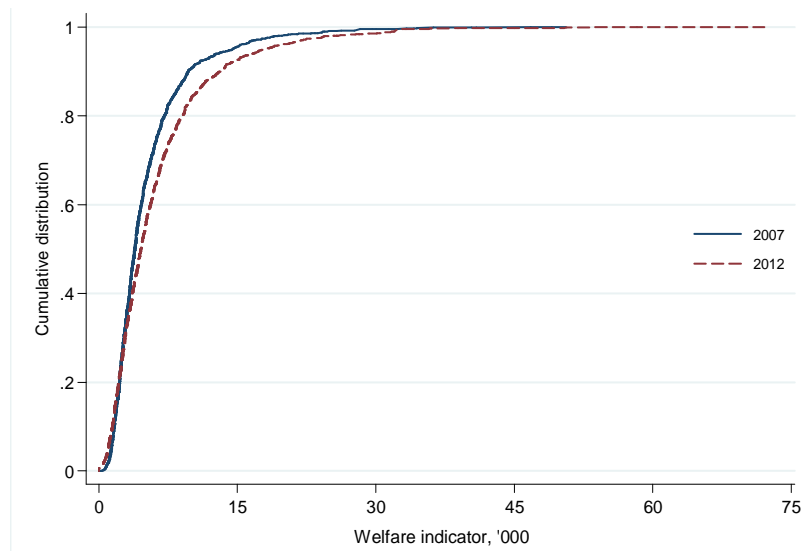
This graph plots the cumulative percentage of poor households (the head count ratio) at each level of the poverty line.
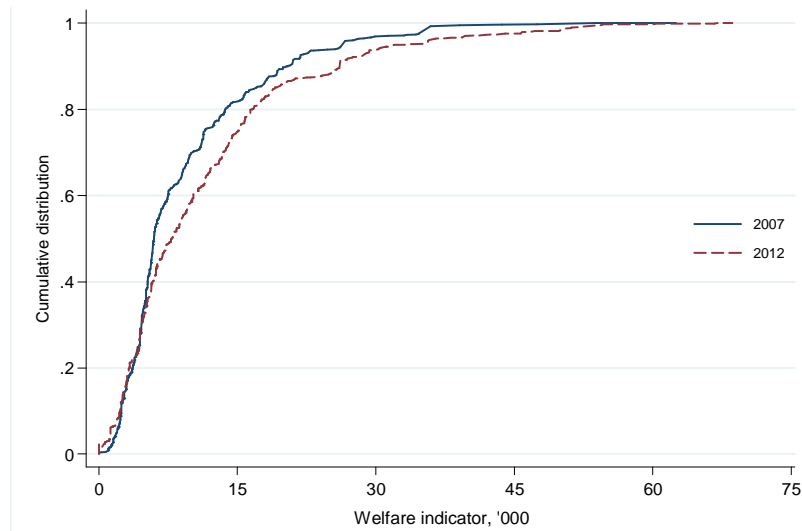
Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.
Note: Welfare indicator is measured by income (thousand VND/person/year).

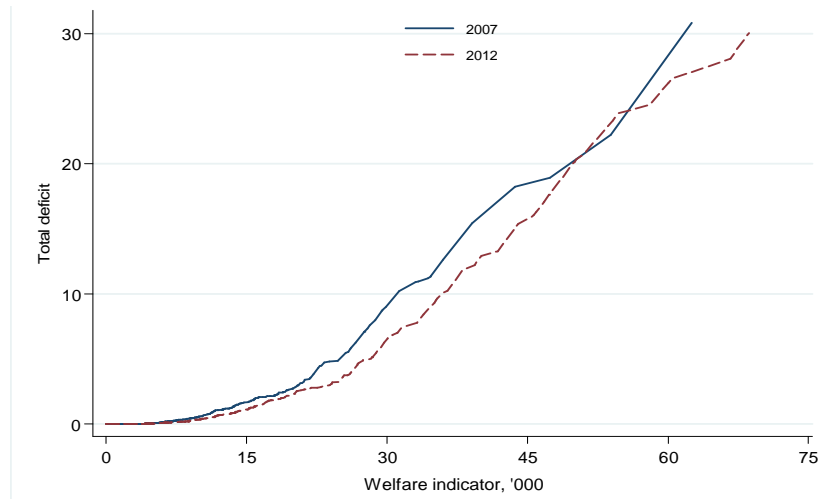**Fig. A.2. Poverty incidence curve of ethnic minority households**

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.
Note: Welfare indicator is measured by income (thousand VND/person/year).

**Figure A.3. Poverty deficit curve of the *Kinh***

The poverty deficit curve is the income shortfall (or the deficit) showing the minimum per capita income of society, which, if transferred to the poor, will bring all the poor out of poverty.

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.
Note: Welfare indicator is measured by income (thousand VND/person/year).

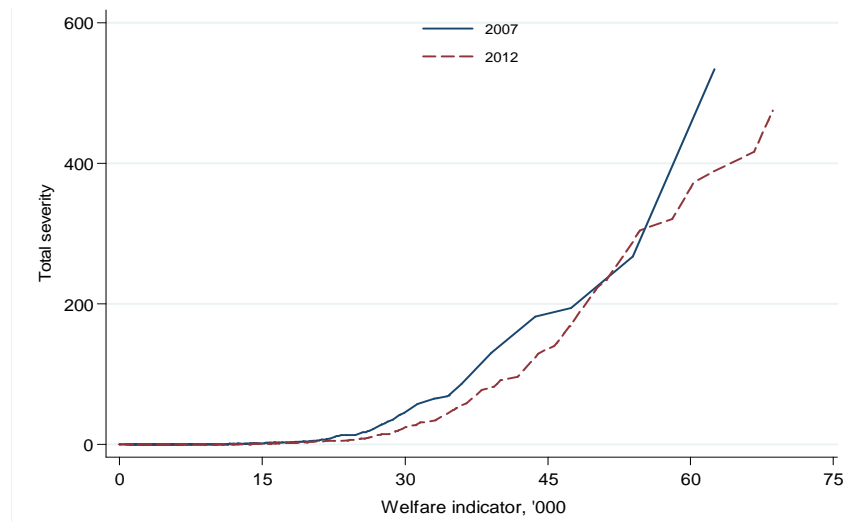**Fig. A.4: Poverty deficit curve of ethnic minority households**
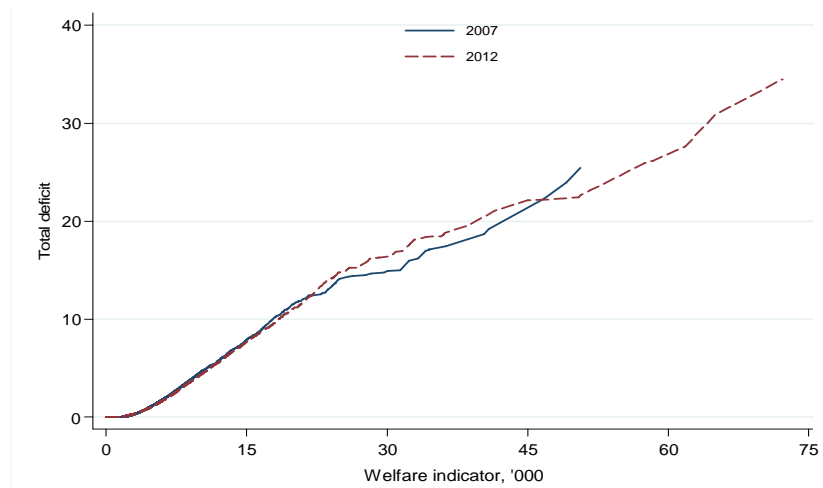
Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.
Note: Welfare indicator is measured by income (thousand VND/person/year).

**Figure A.5. Poverty severity curve of the *Kinh***

The poverty severity curve is measured by the area underneath the poverty deficit curve at each level of the poverty line. As the value of poverty severity increases, the squared gap at a certain poverty line increases.

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.
Note: Welfare indicator is measured by income (thousand VND/person/year).

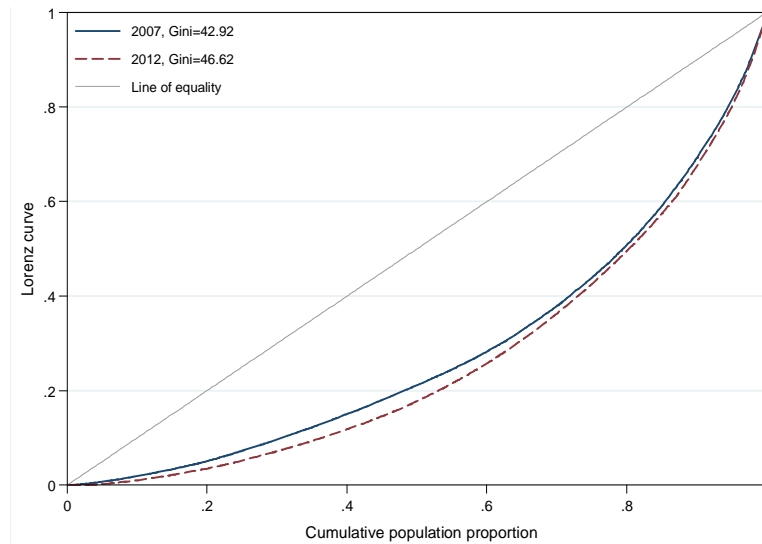**Figure A.6. Poverty severity curve of ethnic minority households**
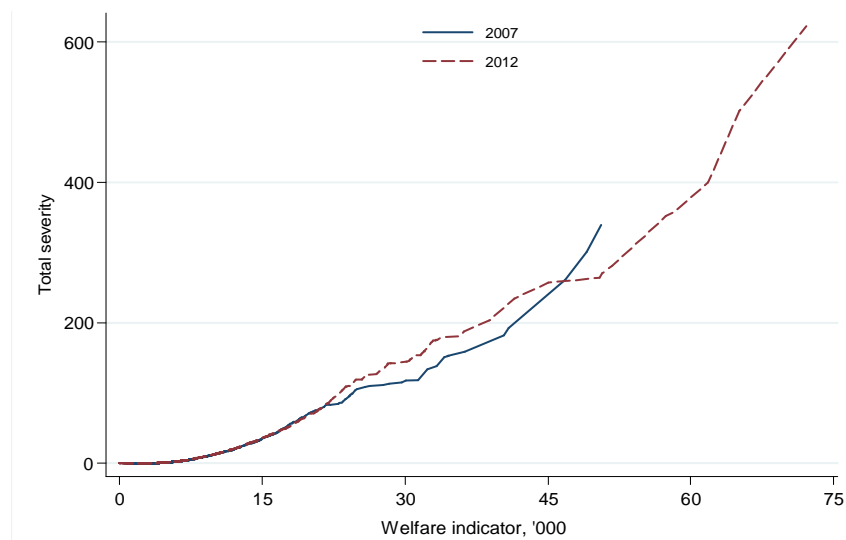
Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.
Note: Welfare indicator is measured by income (thousand VND/person/year).
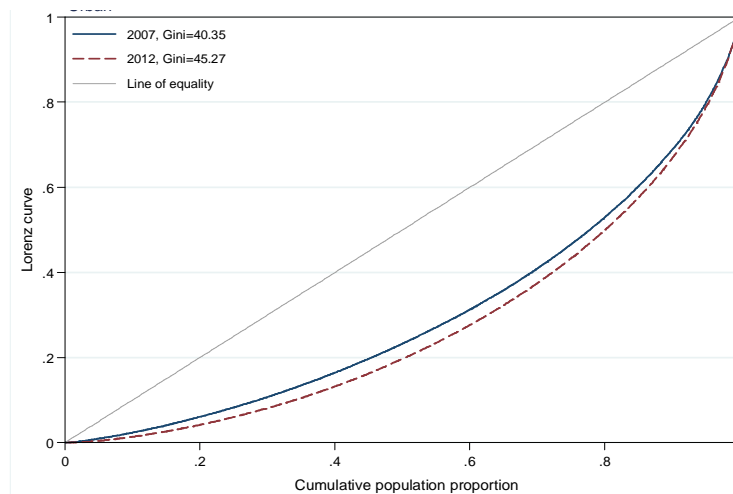
Fig. A.7. Lorenz curve of the *Kinh*

The Lorenz curve plots the proportion of total income held by the poorest *p* percent of the population.

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.
Note: Welfare indicator is measured by income (thousand VND/person/year).

Fig. A.8. Lorenz curve of ethnic minority households

Source: Authors' estimation from the surveys BLS 2007 and ELS 2012.
Note: Welfare   indicator   is   measured   by   income   (in   thousand VND/person/year).

Table A1. Summary statistics of explanatory variables

Variables	Mean	Std. Dev.	Min	Max
Age of household head	41.643	12.41	16.00	90.00
Head is male	0.883	0.32	0.00	1.00
Schooling years of household head	4.668	3.74	0.00	16.00
Household size	4.888	1.91	1.00	16.00
Proportion of children	0.316	0.22	0.00	0.80
Proportion of elderly	0.052	0.14	0.00	1.00
Proportion of female members	0.507	0.18	0.00	1.00
Per capita living area (m2)	12.96	9.49	1.00	200.00
Per capita annual crop land (ha)	0.686	0.93	0.00	19.03
Per capita perennial crop land (ha)	0.144	0.89	0.00	22.00
Receiving remittances	0.833	0.37	0.00	1.00
Receiving allowances	0.194	0.40	0.00	1.00
Borrowing from social bank	0.269	0.44	0.00	1.00
North	0.534	0.50	0.00	1.00
Central	0.250	0.43	0.00	1.00
South	0.215	0.41	0.00	1.00

Source: Authors' estimation from the surveys BLS 2007

Table A.2. Multinomial logit regression of poverty dynamics

Explanatory variables	Persistently poor	Escaped poverty	Fell into poverty
Age of household head	-0.1403***	-0.0926**	-0.0591
	(0.0431)	(0.0439)	(0.0396)
Age of household head squared	0.0014***	0.0011**	0.0006
	(0.0005)	(0.0005)	(0.0004)
Head is male	0.7310**	0.2553	0.1826
	(0.3580)	(0.3409)	(0.2673)
Schooling years of household head	-0.2327***	-0.1596***	-0.1213***
	(0.0222)	(0.0234)	(0.0285)
Ethnic minority	0.7493**	0.5766**	0.6032*
	(0.3807)	(0.2587)	(0.3158)
Central	-0.2994	-0.3234	0.5282*
	(0.2737)	(0.2444)	(0.2786)
South	-1.0503***	-0.7600***	0.2198
	(0.3308)	(0.2676)	(0.2400)
Household size	0.2508***	0.1291*	-0.0132
	(0.0551)	(0.0660)	(0.0675)
Proportion of children	1.7371***	0.7774**	-0.1383
	(0.5641)	(0.3456)	(0.4940)
Proportion of elderly	1.0579*	-0.6767	-0.0975
	(0.5950)	(0.6401)	(0.6356)
Proportion of female members	0.3412	-0.0113	-0.4140
	(0.5159)	(0.4833)	(0.4930)
Per capita living area (m2)	-0.0558***	-0.0470***	-0.0056
	(0.0154)	(0.0158)	(0.0095)
Per capita annual crop land (ha)	-0.8918***	-0.6764***	-0.0764
	(0.1511)	(0.1212)	(0.1102)
Per capita perennial crop land (ha)	-0.1024	-0.0568	-0.1026*
	(0.1027)	(0.0684)	(0.0576)
Receiving remittances	-0.8887***	-0.4616	-0.2952
	(0.2997)	(0.3150)	(0.2787)
Receiving allowances	0.0842	-0.2818	-0.2669
	(0.2557)	(0.2437)	(0.2234)
Borrowing from social bank	0.1793	0.2241	0.4301**
	(0.2309)	(0.1927)	(0.2128)
Constant	3.1284**	2.6067**	1.0135
	(1.2736)	(1.2364)	(1.0349)
Observations	3,515	3,515	3,515

Source: Estimates from the surveys BLS 2007 and ELS 2012.

Notes: *significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

Figures in parentheses are robust SEs, which are found using bootstrap (nonparametric) estimations with 500 replications.

The base outcome is "Persistently non-poor"