Pathways Out of Rural Poverty: A Case Study in Socio-economic mobility in the Rural Philippines *

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Abstract

Exploiting unique household panel data covering a thirty year period, this paper attempts to analyze the patterns of poverty exits by examining socioeconomic mobility in a Philippines village. Macroeconomic growth was a major factor explaining poverty-exit probabilities until the early 1980s. After the 1980s, poverty exit-paths through 'agricultural ladder' narrowed, schooling and growth became equally important factors due to the increased returns to schooling, and labour endowments also became important for the lower, but not upper, social strata (providing an economic incentive to have more children for the poor). Surprisingly, we find no evidence of state dependence in poverty spells once observable factors are controlled.

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Key words: economic mobility, social class, poverty dynamics, rural poverty, Philippines

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Poverty dynamics in developing countries is a relatively under-studied area of research. If major pathways for exiting poverty are empirically identified in country (or region)-specific contexts, policy interventions could be designed for facilitating escape from poverty. One reason for the paucity of such studies is the lack of appropriate data. This paper exploits a unique set of longitudinal micro data covering the period between 1962 and 1994 in a village in the Philippines, and seeks to analyse the patterns of poverty exits and of middle class stability by examining the processes of socio-economic mobility among households.

A major strength of this paper derives from the unique features of the data, which covers a long enough period for addressing medium- to long-term economic mobility and poverty dynamics. Furthermore, in understanding poverty in the locality, this paper utilises intimate knowledge of an anthropologist who conducted detailed fieldwork in the village in the 1960s and 1970s as well as that of the author during his own fieldwork in the 1990s.

The econometric specification in this paper is inspired by the recent (mainstream) theoretical literature on the evolution of social stratification (e. g., Banerjee and Newman, 1993, Ljungqvist, 1993). While these theories suggest potential determinants of economic mobility, it would be useful for policy makers to know empirically and quantitatively which factors are relatively more important in pulling the poor out of poverty. This paper is an attempt in such a direction.

This paper extends the relatively small empirical literature on the determinants of economic mobility in developing countries. This literature has identified factors such as household asset holdings, human capital, and life-cycle, among others.[1] These studies typically examine changes over time in income or consumption expenditures for a relatively short period

of time (mostly up to 5 years).[2] Furthermore, partly due to the relatively short time horizons observed, few studies have examined the impact of economic environments (e. g., macroeconomic growth), changes over time in the relative importance among the factors explaining poverty dynamics, or potentials for state dependence. This paper fills in such gaps in the empirical literature on poverty dynamics in developing countries.

The rest of this paper is organised as follows. The next section describes the study village and the unique features of our data set. The next two sections define our notion of 'socioeconomic status groups' and describe the socioeconomic structure of the village, its changes, and the households' economic mobility patterns during the thirty year period. The following section presents our econometric specification. We then present the estimation results. We draw our conclusions with some policy implications in the final section.

1. The village setting and data features

Our study village is located in the central part of Pangasinan province on Luzon island in the Philippines. The village is located roughly 170 km north of Manila. The principal food crop in the village is rice. Also cultivated during our data period were sugar, tobacco, vegetables (e. g., corn, mongo beans, eggplants) and a variety of fruits (e.g., mango).

The Central Luzon "rice bowl" of the Philippines consists of the *Coastal* Region and the *Inner* Central Luzon Region with distinct agrarian structures following different historical developments; the village under study is located toward the northern end of the Coastal Luzon, which has long been dominated by small-holder tenancy cultivation with paternalistic landlord-tenant relationships (Hayami and Kikuchi, 2000, Anderson, 1964). As in other parts of Central Luzon, most of the farmers adopted high yielding rice varieties (HYV) during the mid- to late-1970s. *Unlike* many other parts of Central Luzon, however, the village farmers have been unable

to acquire the maximum benefit from the adoption of HYV due to insufficient irrigation, nor was the implementation of the land reform program as rigorous as in the inner Central Luzon or other parts of the Coastal region (e. g., Hayami and Kikuchi, 2000). An additional characteristic of the study village is the long history of sending international labour migrants.[3]

House-to-house censuses by total enumeration were conducted in 1962, 1966, 1971, 1976, 1981 and 1994. Our data include information on household demographics and some asset holdings such as land but little information is collected on income (except in 1994) or on consumption expenditures.[4] In addition to the length of the time period covered, another advantage of our data set is total enumeration. When collecting longitudinal sample surveys, there is a trade-off between obtaining a representative sample and tracking individual dynamics; a representative sample in the initial time period tends to become increasingly less representative as the composition of the population changes (e. g., Deaton 1997, p.20). Since our dataset covers all the households at every survey we can observe the representative (in fact, the entire) patterns of the mobility dynamics within the village throughout the period.

To be balanced against such advantages, however, are a few limitations of the data set. One obvious limitation is it being a single village study. Conclusions derived from our study may not necessarily be generalised to cover other parts of the rural Philippines, although it is likely that similar processes were at work in other villages sharing similar characteristics, such as agrarian structure, farm size and reliance on international migration. Another limitation is that our data do not include those households that moved out of the village. We will discuss this issue in section 3 and in the Appendix.

2. Introducing the notion of socioeconomic status groups in the study village

In order to identify alternative exit paths from poverty in the study village, we categorise

village households into four "socioeconomic status groups" and analyse the patterns of movements of households across those categories. While we take this approach partly due to the lack of the measures of income or consumption in our dataset, the approach taken here is arguably a reasonable alternative to the commonly used income-based measures of rural poverty in developing countries.

Dreze et al (1992, p. 33-4) note, for example, that doubts have been raised as to "whether *current* per-capita income in any particular year is a sensible criterion of 'poverty' in economies where current incomes are subject to large short-run variations"(italic in the original). In addition, household incomes in developing countries are measured with massive errors (Dreze, et al. 1992, McCullock and Baulch, 2000). Dreze, et al (1992, p.40) thus argue that "occupational categories, … if combined with other information and an understanding of the local economy, can provide quite useful and sensitive indicators of poverty." We follow such an argument here.

Our notion of the "socio-economic status group" categories as a proximate measure of welfare levels was first developed by Anderson (1964, 1975) who initially spent over a year (1961-1962) in this village. Four socioeconomic status groups were identified, based on the degree of access to agricultural land and the occupation type of the primary income earner of the household[5]: the Irregularly-Employed; Tenant-Farmer; Small-Owner; and the Regularly-Employed.

At the bottom of the socioeconomic status hierarchy is the group of landless *Irregularly-Employed* households consisting of the rural proletarians without access to agricultural land or to secure employment. They typically engage in various casual agricultural (e. g., planting, harvesting) or non-agricultural (e. g., carpentry, selling used clothes) jobs. As the next category, *Tenant-Farmers* are farm operators without land ownership. They are more of rural proletarians

or semiproletarians than pure agriculturists, but have a certain margin of security against hard times due to the traditional system of mutual help between tenants and landowners (Anderson, 1964, p.179). On the other hand, *Small-Owner* households own agricultural land of at least one third of a hectare.[6] With the average farm size somewhat larger than that of Tenant farmers (1.5 ha vs. 0.9 ha in 1994), and unlike the Irregularly-Employed or Tenant households, Small-Owner families often participate actively in social occasions within the village "for the validation of their status" (Anderson, 1964, p.177).

In addition to these social strata based on access to land, there is a distinct group of the non-agricultural *Regularly-Employed* households deriving their primary incomes from secure non-agricultural employment or enterprise (e. g., school teachers, rice-mill operators, full-time employees in private businesses, variety store owners, etc.). This category also includes the households mainly dependent on incomes from household members working abroad. Although all the Regularly-Employed households are not uniformly wealthy, the wealthiest households in the village belong to this group and constitute a part of the middle-class at the national level.[7]

As supplementary information to the first-hand and essentially 'qualitative' observations made by Anderson (1964, 1975), Table 1 summarises per capita household income and average house value in 1994 by socioeconomic status groups. Acknowledging that the income figures are measured with large measurement errors,[8] we observe that the average per capita incomes among the Irregularly-Employed and Tenant farmers are both below the poverty line of P6,000.[9] The differences in the mean per-capita incomes and house values are statistically significant between adjacent status groups except for the mean incomes between Tenants and the Irregularly Employed.[10]

Based on Anderson (1964)'s observations and qualitative information obtained during the

author's fieldwork in 1994, as well as on our 1994 income data, in our following discussions, we consider the households belonging to the Irregularly-Employed and the Tenant categories as the "poor households." This approach is thus similar to Dreze, et al (1992)'s approach equating the 'agricultural labour households' with poor households; their rather broad definition of the 'agricultural labour households' apparently encompasses both the Irregularly-Employed and Tenant Farmers in our definition.[11]

Finally, a few words on the notion of the household in this village are in order. In our definition, household members share a residence and eat their meals together on a regular basis. As an exception, a person contributing the largest income share to the household is considered as a household member even if she does not reside in the dwelling on a regular basis (e. g., an international contract worker). In this village, as observed by Anderson (1964), by far the most preferred residential arrangement is a nuclear family. For example, the proportion of the households containing more than two generations within the household was 19% and 16% in 1962 and 1994, respectively. The proportion of the households containing more than one (living) married couple was only 7% in both 1962 and in 1994.

3. Changes in the village social structure and mobility patterns, 1962-1994

Table 2 shows the changes in the composition of socioeconomic status groups in the village over the thirty year period. The degree of dependence on the agricultural sector for livelihood declined significantly throughout the thirty year period, as reflected in the sharp decline in the share of Small-Owners and in the moderate decline in the share of Tenant-Farmers. On the other hand, the poorest group, the Irregularly-Employed, expanded substantially through the 1960s and the 1970s and then shrank moderately after the 1980s. The share of the Regularly-Employed increased drastically during the thirty year period and become the largest group by

1994.

Table 2 (the bottom row) and Table 3 indicate that much of the increase in the Regularly-Employed between 1981 and 1994 can be attributed to the upward mobility due to the expansion of international migration opportunities. The number of international labour migrants increased dramatically (Table 2), which explains a majority (53%) of the household mobility into the Regularly-Employed status between 1981 and 1994 (Table 3).

Patterns of household economic mobility can be summarised by a transition matrix for each observation period (Table 4). Between 1962 and 1981 the majority of the households stayed in the same status group in every five year period (all diagonal entries are greater than 0.5). Similar transition matrices constructed from developing countries based on relative expenditure (income) quintiles typically find diagonal entries of 30 to 40% (around 25%) over a five year period (Baulch and Hoddinott, 2000). Our notion of socioeconomic mobility thus appears to capture the kind of economic mobility that is of longer-term consequences than is mobility indicated by income or expenditure measures. The 5 year-"poverty exit" (i. e., movements toward the Small-Owner or the Regularly-Employed status) probabilities among the Irregularly-Employed were typically below 10% except for the 1971-76 and 1981-94 periods, while the poverty exit probabilities among Tenant farmers were between 10 to 20% except for the 1981-94 period. Between 1981 and 1994, the transition probability of staying in the same status appears significantly lower (except for the Regularly-Employed), although the 1981-94 transition matrix cannot be directly compared with the five-year transition matrices in the previous periods.

Within our framework, exit paths from poverty could take either through the "agricultural ladder" toward the Small-Owner status or through non-agricultural regular employment. Table 5

shows that the proportion of upward mobility through the regular employment, rather than through the agricultural route, tended to increase over the past three decades both among the Irregularly-Employed and Tenant-Farmers.

Transition matrices (Table 4) also show that typically 10 to 15% of the Irregularly-Employed and the Regularly-Employed households and 10 % or less among Tenant farmers or Small-Owners moved out of the village. Arguably, Regularly-Employed households are likely to emigrate (only) if they find better economic opportunities outside the village; this would suggest that, to the extent that the out-migration of the Regularly-Employed results in upward mobility, the relatively high probability of not moving downward among the Regularly-Employed may be still underestimated. On the other hand, out-migration among the Irregularly-Employed could result either from rural-urban migration seeking better economic opportunities or from rural-rural migration resulting in relatively little improvement in socio-economic status (Anderson, 1975).[12] To the extent that urban migration, accompanied by upward mobility, dominates the out-migration among the Irregularly-Employed, our estimate of poverty exit probability is likely to be underestimated; if rural-rural migration without improvement in socio-economic status dominates, on the other hand, our estimated poverty exit probability could be overestimated. The lack of information on out-migrants in our data, therefore, is a potential concern. Recent studies focusing on the possible biases due to sample attrition, however, have repeatedly found that such biases are empirically surprisingly small even when the attrition rate is as high as 50% (e. g., see Alderman et.al, 2001). Despite recent findings, we have conducted some statistical tests, as well as sensitivity analyses with alternative assumptions about the out-migration of the poor, as summarized in the Appendix.

4. An empirical model of socioeconomic mobility

4.1. Econometric specification

Our econometric specification explaining transition probabilities applies the multinomial logit model as the reduced form based on a household decision making model, which is inspired by the recent developments in the (mainstream) literature explaining the evolution of social stratification. These models, as represented by Banerjee and Newman (1993), and Ljungqvist (1993), generally show that the combination of credit market imperfections and some kind of indivisibility of one of the investment activities (e. g., human capital investment) leads to different patterns of social stratification as steady-state equilibria that are dependent on the patterns of initial distribution of wealth. A major implication of these models is that the distribution of wealth among households is a major determinant of the patterns of subsequent social mobility among households.

In rural economies a stock of household wealth typically consists of agricultural land, human capital and labour endowment. We assume that the household maximises its utility over the next five year horizon by setting optimal investment in land and human capital and the change in labour endowment, given the initial stock of land (A_t), human capital (H_t) and total household labour endowment (L_t) at the beginning of period t. Indirect utility function of the household V(.) is defined as a function of the initial stock and the economic environments:

$$\max \sum_{s=t}^{T} \delta^s U\left(C_s, L_s^L\right) \equiv V(t, A_t, H_t, L_t, Z_t, p_t^F), \qquad (1)$$

where U(.) is a household utility function, C_t is aggregate consumption at time t, L_t^L is leisure at time t, δ is a discount factor, Z_t represents exogenous economic environments during the period between time t and T (such as the GDP growth rate), and p_t^F represent price (and wage)

variables. By denoting the set of state variables as a vector $\mathbf{X}_t^i$ and assuming that the indirect utility can be approximated by a linear relation, i. e.,

$$\mathbf{X}_t^i \equiv \{t^i, A_t^i, H_t^i, L_t^i, Z_t, p_t^F\}' \text{ and} \tag{2}$$

$$V^i_{t\,\Big|\,\substack{\text{status j at t}\\ \text{status k at T}}} \approx \mathbf{X}_t^{i\prime}\beta_{jk}, \tag{3}$$

where "$V^i_{t\,\Big|\,\substack{\text{status j at t}\\ \text{status k at T}}}$" represents the level of the indirect utility of household i when the household move from socioeconomic status j in period t to status k in period T, we estimate the transition probability:[13]

$$P_{jkt}^i = \frac{\exp\left(\mathbf{X}_t^{i\prime}\beta_{jk}\right)}{\sum_{h=1}^{M}\exp\left(\mathbf{X}_t^{i\prime}\beta_{jh}\right)}, \tag{4}$$

where P_{jkt}^i is the probability that household i moves from status j in period t to status k in period T, $\boldsymbol{\beta}_{jk}$ is the parameter vector to be estimated, and M is the total number of socioeconomic status categories (= 4). For each origin status j, the coefficient vector $\boldsymbol{\beta}_{jj}$ is normalised to be zero.

One complication in applying the multinomial logit specification to our data set is the uneven data interval; while the census was conducted in every (almost) five years between 1962 and 1981, there was a thirteen year interval between 1981 and 1994. Assuming that the economic mobility processes follow a first-order Markov chain, we estimate our multinomial logit model by decomposing the observed mobility between 1981 and 1994 into three sequential transitions of roughly 5 year each —1981-85, 1985-89, and 1989-94. Then the observed transition probability of a household i moving from status j in 1981 to status k in 1994 can be written as:

$$P^i_{jk}(1981-94) = \sum_{l=1}^{4}\sum_{m=1}^{4} P^i_{jl}(1981-85)P^i_{lm}(1985-89)P^i_{mk}(1989-94), \qquad (5)$$

where j, k, m, and l index socioeconomic status categories. Using equation (4) and (5), we obtain the log likelihood function for the entire data set as follows:

$$\ln L(\boldsymbol{\beta}|\mathbf{X}) = \sum_{t=1962}^{1976}\sum_{i=1}^{N(t)}\sum_{k=1}^{4}\sum_{j=1}^{4}\left[y^i_j(t)y^i_k(T)\left\{ \mathbf{X}^i_t{}'\beta_{jk} - \ln\left(\sum_{h=1}^{4}\exp(\mathbf{X}^i_t{}'\beta_{jh})\right)\right\}\right] +$$

$$\sum_{i=1}^{N(1981)}\sum_{j=1}^{4}\sum_{k=1}^{4}\left[y^i_j(1981)y^i_k(1994)\ln\sum_{m=1}^{4}\sum_{l=1}^{4}\left\{ \frac{\exp(\mathbf{X}^i_{1981}{}'\beta_{jl})}{\sum_{h=1}^{4}\exp(\mathbf{X}^i_{1981}{}'\beta_{jh})}\frac{\exp(\mathbf{X}^i_{1985}{}'\beta_{lm})}{\sum_{h=1}^{4}\exp(\mathbf{X}^i_{1985}{}'\beta_{lh})}\frac{\exp(\mathbf{X}^i_{1989}{}'\beta_{mk})}{\sum_{h=1}^{4}\exp(\mathbf{X}^i_{1989}{}'\beta_{mh})}\right\}\right] \qquad (6)$$

where $y^i_j(t)$ is an index taking value one if household i belongs to status j in period t and zero otherwise, $y^i_j(T)$ is the same index for the period five years after period t, and N(t) is the total number of observations in period t.[14]

4.2 Explanatory variables

Our explanatory variables (i. e., $\mathbf{X}^i_t$) consist of household characteristics and economic environments. Household characteristics include the age of the household head (and its square), which controls for the life-cycle effects of mobility, and three components of household endowments —labour endowment (the total number of living children regardless of their location of residence); land (the size of the land *cultivated* in hectares for Tenant Farmers and of the land *owned* for Small-Owners); and human capital (the total years of schooling of the household head and his/her spouse plus the average years of schooling among children of age over 10). For the Small-Owner status, we also include a dummy variable for 'owner-tenant', which takes the value one if the household's cultivated land size exceeds (by renting-in additional lands) the owned

land size. We interpret the 'owner-tenant' dummy to capture an aspect of heterogeneity among farmers; being an owner-tenant indicates a strong commitment to (or preference for) farming as an occupation.[15] The variables representing economic environments include:[16] the national GDP growth rate (annual average over the five year period); real wage rate (averaged over the five year period) –for Irregularly-Employed and Regularly-Employed; agricultural terms of trade[17] (average over the five year period)—for Tenant Farmers and Small Owners.[18]

In addition, a potential source of economic mobility is the change in the returns to endowments (Gunning, et al 2000). There were major changes during the 1980s in the village, such as the drastic explosion of international migration opportunities, which could potentially have major impacts on the prospects for household mobility. We thus test a hypothesis that the returns to household endowments (labour, land and human capital), as measured by their impact on the upward mobility probability, changed after the 1980s by including interaction terms between these endowment variables and a dummy taking the value one for the observations between 1981 and 1994. Descriptive statistics of the covariates are shown in Table 6.

5. Estimation results

The estimated coefficients are shown in Table 7. Table 8 summarises the estimated marginal impacts (evaluated at the mean level of the covariates) on the transition probabilities of the statistically significant explanatory variables of socio-economic mobility (except for the life-cycle effects). Generally we find that the household asset variables are significantly associated with socioeconomic mobility, in line with the theoretical models cited above. We additionally find, however, that other factors, such as macroeconomic environments, are also major determinants of economic mobility.

5.1. Exit paths from poverty: Socioeconomic mobility from Irregularly-Employed and Tenant-Farmer status

The first three columns in Table 7 report the estimated coefficients, with t-statistics in parentheses, for the probability of household mobility from the Irregularly-Employed to the other three status groups (relative to the probability of remaining Irregularly-Employed), and the first five rows in Table 8 show the estimated marginal impacts on transition probabilities of the statistically significant covariates. None of our explanatory variables is statistically significant in explaining the transition probability of moving from the Irregularly-Employed to the Tenant Farmer status. This is not surprising, however; based on our informal interviews with farmers, a typical way for a landless labourer to become a tenant farmer or for a farmer to expand his operating farm size is that, given the land scarce and labour abundant environment, a landowner selectively approaches his prospective tenants based on the reputation such as 'being hard working.' Thus, the acquisition of the tenant status appears to be mainly dictated by the combination of such innate ability and personal connections which are observable, via reputation within the community, to landowners but unobservable to outside researchers.

The statistically significant variables associated with the transition probability of moving from the Irregularly-Employed to the Small-Owner status, on the other hand, are the GDP growth rate and, after the early 1980s, the number of children; one percentage point increase in (or one standard deviation increase in) GDP growth rate is associated with a 10 (or 32) percentage point increase in the transition probability, and having one (or one standard deviation) additional child is associated with an increase in the transition probability by 8.7 (or 21) percentage points. In contrast, the significant variables associated with the transition from the Irregularly-Employed toward the Regularly-Employed status are the human capital stock and the GDP growth rate. As

expected, education is a key variable associated with the movement toward the Regularly-Employed status, and, furthermore, its marginal impact increased nearly fivefold after the 1980s; its marginal impact on the transition probability associated with one additional year (or one standard deviation) of schooling jumped from 0.2 (or 1.3) to 1 (or 5) after the 1980s. This appears to reflect the expansion in the international migration opportunities, which is a main avenue toward the Regularly-Employed status during the period. Based on the elasticity estimates, the impact of macroeconomic growth on the mobility prospects toward the Regularly-Employed status was three times that of schooling in the 1960s and the 1970s but, after the increase in the 'returns to education' after the 1980s, the relative importance (measured by the size of elasticities) of the schooling and the GDP growth rate were reversed.

Coefficient estimates for economic mobility among Tenant farmers are found in the third through the sixth columns in Table 7, and the associated marginal impacts of the statistically significant covariates in the sixth through the eleventh rows in Table 8. While the key to maintaining the tenant status (i.e., *not* moving to the Irregularly-Employed status) appears to be the farm size, its quantitative impact is rather small. In addition, as we discussed earlier, this variable could potentially be picking up the effects of unobserved innate ability of farmers.

As for upward mobility among Tenant-Farmers, their mobility prospects toward the Small-Owner status are significantly associated with education, agricultural terms of trade and GDP growth rates. While schooling is a statistically significant variable, however, its quantitative impact is very small; an additional year (or one standard deviation) of schooling is associated with a 0.003 (or 0.02) percentage point increase in the transition probability. In addition, higher agricultural terms of trade apparently provide an incentive for Tenant-Farmers to invest in agricultural land and to become Small-Owners; one standard deviation increase in the

agricultural terms of trade is associated with a 0.3 percentage point increase in the transition probability. The significantly negative effect of higher GDP growth rates might suggest that when the GDP growth rate is high the *members of* Tenant-Farmer *households* may seek non-agricultural occupations (while maintaining their farms) rather than investing in agricultural land to become Small-Owners.

Among Tenant-Farmer households, an additional year (or one standard deviation) of schooling is associated with a one (or 5) percentage point increase in the transition probability toward the Regularly-Employed status. In addition, after the early 1980s, a larger household labour endowment (after controlling for the average schooling among children) is significantly associated with upward mobility through the non-agricultural sector. Again this likely reflects the rapid expansion of the international migration opportunities which could be better captured with a larger number of household members to deploy overseas.

We noted earlier that the pathways through the 'agricultural ladder' narrowed dramatically after the 1980s. A search for exit paths from poverty, therefore, should perhaps focus on the non-agricultural path. Crucial for poor households to take such a path are expanding economic opportunities (such as higher economic growth or overseas employment) combined with access to education.

One intriguing finding is the positive relationship between the number of children and the prospect for upward mobility among the poor. In the Philippines, the population growth has remained relatively high in the recent few decades and the spread of family planning has been slow. Such a phenomenon has often been attributed to cultural or religious reasons (e. g., the Filipinos being dominantly Roman Catholic). Instead, our results suggest a possibility that such behaviour of the poor may be economically rational as well; that is, they may in fact intend to

have a larger number of children due to the higher likelihood of upward mobility.

5.2. Explaining mobility among Small-Owners and the Regularly-Employed

We now turn to economic mobility among the upper-strata within the village status hierarchy; Small-Owners and the Regularly-Employed (see 7th through 12th columns in Table 7 and 12th through the last rows in Table 8). The significant variables associated with downward mobility from the Small-Owner to the Irregularly-Employed status are the number of children, schooling, the size of land ownership, and the 'owner tenant' dummy reflecting a strong commitment to farming. An additional year (or one standard deviation) of schooling is associated with a 0.02 (or 0.1) percentage point decrease, and an additional hectare (or one standard deviation) of land ownership is associated with a 0.16 (or 0.19) percentage point decrease, while being an 'owner tenant' is associated with a 0.6 percentage point decrease, in the downward transition to the Irregularly-Employed status. Furthermore, the impact of the number of children apparently increased after the early 1980s; the marginal *positive* impact on the probability of *moving downward* to the Irregularly-Employed status associated with an additional child (or one standard deviation increase in the number of children) increased from 0.03 (or 0.09) percentage point in the 1960s and the 1970s to 0.1 (or 0.3) percentage point after the early 1980s. Thus, having a larger number of children appears to have opposite effects between the lower and the upper strata within the village; higher fertility facilitates *upward* mobility among the lower social strata but it facilitates *downward* mobility among Small-Owners.

On the other hand, the key variables associated with downward mobility from the Small-Owner to the Tenant-Farmer status are the number of children (after the 1980s only) and the size of land ownership. The significant variables associated with the transition probability of moving from the Small-Owner to the Regularly-Employed status are the years of schooling and the

'owner-tenant' dummy. While an additional year (or one standard deviation) of schooling was associated with a 0.1 (or 0.6) percentage point increase in the transition probability during the 1960s and the 1970s, such impact of schooling increased further by almost fourfold after the early 1980s. In addition, after the early 1980s, the size of land ownership also became significantly associated with mobility from the Small-Owner to the Regularly-Employed status. The size of landholdings among Small-Owners, however, may partly reflect the household's preference or commitment to farming and thus a larger landholding could indicate less willingness to exploit the expanding non-agricultural employment opportunities.

The Regularly-Employed category is the most stable status group with the highest probability of staying in the same status group (as seen from the high diagonal transition probabilities in Table 4). While some key variables, most notably schooling, are statistically significant in explaining downward mobility out of the Regularly-Employed status, a conspicuous feature of the transition probabilities for the Regularly-Employed is the very small marginal impacts of the covariates; the absolute values of the transition probabilities are not affected very much by a change in any of the covariates (the last six rows in Table 8).

5.3. Testing for potential state dependence

Our econometric specification assumes that the social status position of a household five years later is explained by the social status position and other household characteristics at the initial year but is not affected by the history prior to the initial year. Such an assumption is violated if, for example, the probability of moving out of poverty is affected by the length of past 'spells' in poverty. We thus examine whether the transition probability of economic mobility is potentially affected by state dependence by including lagged dummy variables taking the value one if the household belonged to the same social status five year prior to the initial year (thereby

testing the possibility that the household position 10 years ago has additional explanatory power, on and above its position five years ago, of the current household position).[19]

The null hypothesis that the lagged-same status dummies have no significant effect, tested simultaneously across all status groups, is rejected (P-value = 0.008). When the lagged status dummy is tested for each origin status separately, however, then the null hypothesis of no state dependence is *not* rejected for the origin group of the Irregularly-Employed and Tenant, but is rejected for the Small-Owner (at 5% level) and the Regularly-Employed (at less than 1% level) status (Table 9-1). When the significance of the state dependence is tested individually for each *origin-and-destination status pair* (as shown in the t-statistics in Table 9-2), then the lagged-same status dummy has significant negative effects for the transition from the Regularly-Employed to the Small-Owner and to the Tenant status. Thus, the series of test results are somewhat mixed, but, to the extent the state dependence may exist, it is among the upper social strata (especially the Regularly-Employed). There is little indication of state dependence among the lower social strata *once observable factors are controlled*.

This is surprising in light of the existing studies from both developed and developing counties. In India, as well as in the United States, a portion of the poor appears to constitute a social 'underclass' whose poverty status is self-perpetuating (e.g., Dreze et. al., 1992, Bane and Ellwood, 1986, Stevens, 1995). However, similar kind of structured social exclusion appears to be absent in the village under study. The kind of caste system as found in India, for example, is not found in the Philippines. An additional explanation may be the increased accessibility among the Irregularly-Employed to the relatively lower skilled job opportunities abroad (e.g., domestic helpers in Southeast Asia) after the late 1970s. Furthermore, while ethnic minorities do exist in various parts of the Philippines,[20] none is found in this village; in other words, we should be

careful in generalizing our findings about the absence of 'poverty traps', and such possibility must always be carefully examined before similar conclusion is drawn in any other part of the Philippines.

6. Conclusions

Our finding that the size of initial endowment is significantly associated with the patterns of subsequent economic mobility is consistent with the predictions of the dynamic models of household stratification, such as Banerjee and Newman (1993) and Ljungqvist (1993), implying that the poor are prevented from upward mobility due to the combination of credit market failure and the indivisibility of investments. We also find, however, that changes in economic environments, such as the speed of macroeconomic growth, was at least as important (and arguably more important during the 1960s and the 1970s, based on the relative magnitudes of the elasticity estimates) a source of upward economic mobility for the poor as the initial endowments. Our results suggest, therefore, that while various theoretical models point to different mechanisms of economic mobility it is important to examine empirically the relative importance of the determinants of economic mobility in country specific contexts before designing policies for poverty reduction.

Furthermore, our results show that the magnitude of the quantitative association between sources of mobility and transition probability, and thus the relative importance among the sources of mobility, could change substantially over time. We find, for example, significant changes over time in the relative importance between the initial asset distribution and the economic environments as determinants of poverty escape for the Irregularly-Employed. In addition, among different types of assets, the returns to human capital (for the Irregularly-Employed) and labour endowments (for Tenants) in acquiring the Regularly-Employed status increased

significantly, due to the expansion of the international migration opportunities after the 1980s. With the absence of parallel increase in the returns to land, the relative importance for upward mobility of the human capital apparently increased relative to that of land.

Our empirical findings contain a series of implications for designing policies for poverty reduction in the rural Philippines. On one hand, we confirm the predictions of the theoretical models emphasizing the importance of the initial wealth distribution, and a major policy implication of those models has been the potential effectiveness of land reform as a policy instrument for both growth and equity. We also find that higher agricultural terms of trade facilitate accumulation in the agricultural sector. These findings would support an agricultural development strategy for rural poverty reduction consisting of (further acceleration of) the land reform program combined with agricultural price policies. Nevertheless, in light of the rapid narrowing of the 'agricultural ladder' as a pathway out of rural poverty and the substantial increase in the relative returns to human capital vis-à-vis land after the 1980s, the agricultural development strategy *alone* is not likely to lift the mass of the rural poor out of poverty given the structure of today's rural Philippines.

Pulling the mass out of rural poverty through the increasingly expanding path through non-agricultural opportunities requires investment in human capital and rapidly expanding economic opportunities outside agriculture. International migration has played a major role in pulling the landless poor into a higher economic status in the study village. While the government policies to facilitate foreign contract work have been somewhat controversial within the Philippines, from the point of view of poverty reduction, this line of policies is unambiguously pro-poor. Finally as a somewhat optimistic note, the apparent lack of serious 'social exclusion' (state dependence) in poverty dynamics suggests that policy interventions

addressing the observed factors (especially access to education and economic growth) could well go a long way in pulling the poor out of poverty in this village.

Notes

[1] E.g., Jalan and Ravallion, 2000. See Baulch and Hoddinott (2000), Hulme and Shepherd (2003) for recent surveys.

[2.] Exceptionally, Gaiha and Deolalikar (1993) use the ICRISAT data set covering a 10 year period and Fuwa (1999) uses a Philippine dataset over 20 years.

[3] Pangasinan Province, for example, was among the four main provinces supplying migrant farm labourers to Hawaii in the early 20th century (Anderson, 1975). In 1994 around 30% (compared to 17% at national average) of the households in the village received remittances from abroad (Rodriguez, 1998).

[4.] Household censuses between 1962 through 1981 were collected by James N. Anderson, an anthropologist, and 1994 census by the author.

[5.] Each census asked (subjective assessment by the respondent of) the percentage shares of income contribution for each household member. The 'main income earner' was identified as the household member with the highest share of household income contribution. During the period between 1962 and 1981 roughly 95%, and 83% in 1994, of the main income earners were the (self-reported) household heads.

[6.] Farm households with less than 1/3 hectare are categorised as Tenant-Farmers in our classification.

[7] Three of the four socioeconomic groups are defined in terms of the degree of access to the most important means of production in village economies, i.e., agricultural land; they arguably constitute social 'class' categories in conventional sense. The group of the Regularly-Employed, however, contains both *petit bourgeoisie* (much like Small-Owners), such as rice-mill owners, and proletarians, such as construction workers in the Middle East. We introduce the 'status groups' notion as a proximate measure of the level of economic well-being of each household in order to identify alternative pathways of escaping rural poverty. Formal class analysis is beyond the scope of the present paper.

[8] Based on the author's fieldwork, potential sources of measurement errors are numerous. The annual incomes of the Irregularly-Employed could be overestimated (when, for example, the frequency of a particular job, like the average days worked per week or month, is difficult to obtain retrospectively and can be overestimated—e. g., a house painter has no work whenever it rains--) or underestimated (since it is often difficult to capture all the jobs with relatively short durations during the past 12 months). Furthermore, the incomes of both Tenant Farmers and Small-Owners are likely to be underestimated because their supplementary non-farm incomes are sometimes not well captured.

[9.] The poverty line used here is based on Balisacan (1999).

[10] The author's observations in 1994 suggest that some of the inter-status group distances in living standards might have changed somewhat during the last few decades. For example, according to the farmers interviewed in 1994, traditional 'patron-client' relationships between tenants and landowners may have weakened substantially by the 1990s (with the conspicuous absence of the credit extended by landowners to their tenants being a prime example), thereby reducing a distinctive advantage that Tenant households had vis-à-vis the Irregularly-Employed, while the range of economic activities by the Irregularly-Employed (such as handicraft making, hired tricycle driving) expanded. The amount of the land *owned* by Small-Owners also declined from 1.5 hectare in 1962 to 0.9 hectare in 1994 although the average size of land *cultivated* remained stable. At the same time, with the increased range of the economic activities among the Regularly-Employed (most notably international migration) the distance in living standard of this status group from the other groups may have also increased.

[11] Dreze et al (1992, p.30) define the 'agricultural labour' households as those households "with some involvement (however small) in casual agricultural labour during the relevant survey year."

[12.] One common reason for rural-rural migration in this village, based on the author's informal interviews, is that, during early periods of their married life, they live alternately close to the parents of both the household head and of his spouse who are usually from nearby villages.

[13] The explicit derivation of the multinomial logit model can be found in the working paper version of this paper, which is available from the author upon request.

[14] While this specification does not require information on the status position of households in 1985 or 1989, it does require the $\mathbf{X}_t^i$ vectors for those years. They are estimated by linear interpolation using the 1981 and 1994 data.

[15.] This interpretation is based on Anderson (1964). The 'owner-tenants' in our study village tend to be committed farmers who are relatively more "innovative and progressive."

[16.] Since these macroeconomic variables are common across all households, the only source of variability in these variables comes from their variation over time.

[17.] Measured by the ratio of rice price to the weighted average of the CPI and an index of farm expenditure based on the weighted average of farm wage index and fertiliser price index.

[18.] Theoretically, both wage rates and agricultural terms of trade could affect socioeconomic mobility across all status groups. However since it would be difficult to identify the differential impacts of two price variables in our model due to the small number of data points over time, which is the only source of variation, only one of the two price variables that is likely (on *a priori* basis) to have a more direct connection to each origin status group is included.

[19.] The correlation between the current and the past states could result either from the 'true state dependence' or from 'spurious state dependence' due to unobserved heterogeneity (Heckman 1981). This possible distinction is not pursued further here, however, since we find little evidence of potential state dependence among the poor.

[20] A prime example is the *Aeta* minority who were displaced after the eruption of the Mount Pinatubo in the early 1990s.

Bibliography

Alderman, H., Behrman, J., Kohler, H-P., Maluccio, J., Watkins, S. 2001. Attrition in Longitudinal Household Survey Data. *Demographic Research*, vol. 5, no. 4. pp.79-124.

Anderson, J. N., 1964. Land and Society in a Pangasinan Community, in: Espiritu, S. C., Hunt, C. L. (eds.) *Social Foundations of Community Development*, Manila, R. M. Garcia Publishing.

Anderson, J. N., 1975. Social Strategies in Population Change: Village Data from Central Luzon, in J. F. Kautuer and L. McCaffrey (eds.) *Population and Development in Southeast Asia*. London, Lexington Books.

Balisacan, A. M., 1999. *Poverty Profile in the Philippines: an update and reexamination of evidence in the wake of the Asian crisis*. Quezon City, University of the Philippines School of Economics.

Bane, M. J., Ellwood, D. T., 1986. Slipping into and out of Poverty: The Dynamics of Spells, *Journal of Human Resources*, pp.1-23.

Banerjee, A. V., Newman A.F, 1993. Occupational Choice and the Process of Development, *Journal of Political Economy*, Vol. 101, pp.274-298.

Baulch, B., Hoddinott, J., 2000. Economic Mobility and Poverty Dynamics in Developing Countries, *Journal of Development Studies*, Vol. 36, pp.1-24.

Deaton, A., 1997. *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy*. Baltimore, Johns Hopkins University Press.

Dreze, J., Lanjouw, P., Stern, N., 1992. Economic Mobility and Agricultural Labour in Rural India: A Case Study, *Indian Economic Review: Special Number in Memory of Shukhamoy Chakraverty*.

Fuwa, N., 1999. An Analysis of Social Mobility in a Village Community: the case of a Philippine village, *Journal of Policy Modeling*, Vol.21, pp. 101-138.

Gaiha, R., Deolalikar, A., 1993. Persistent, Expected and Innate Poverty: estimates for semi-arid rural South India, 1975-1984, *Cambridge Journal of Economics,* Vol. 17, pp.409-421.

Gunning, J., Hoddinott, J, Kinsey, B., Owens, T, 2000. Revisiting Forever Gained: Income Dynamics in the Resettlement Areas of Zimbabwe, 1983-96, *The Journal of*

Development Studies, Vol. 36, pp.131-154.

Hausman, J., McFadden, D., 1984. Specification Tests for the Multinomial Logit Model, *Econometrica*, Vol. 52, pp.1219-1240.

Hayami, Y., Kikuchi, M., 2000, *A Rice Village Saga: Three decades of Green revolution in the Philippines*. London: Macmillan.

Heckman, J. J., 1981. Statistical Models for Discrete Panel Data, in: Manski, C. F, McFadden, D. L. (eds.), *Structural Analysis of Discrete Data with Econometric Applications*, Cambridge, MIT Press.

Hulme, D., Shepherd, A., 2003. Conceptualizing Chronic Poverty, *World Development*, Vol. 31, pp.403-453.

Jalan, J., Ravallion, M., 2000. Is Transient Poverty Different? Evidence for Rural China, *The Journal of Development Studies*, Vol. 36, pp.82-99.

Ljungqvist, L., 1993. Economic Underdevelopment: the case of missing market for human capital, *Journal of Development Economics,* Vol. 40, pp.219-239.

McCullock, N., Baulch, B., 2000. Simulating the Impact of Policy Upon Chronic and Transitory Poverty in Rural Pakistan, *The Journal of Development Studies*, Vol. 36, pp. 100-130.

Rodriguez, E., 1998. International Migration and Income Distribution in the Philippines. *Economic Development and Cultural Change*, Vol. 46, No. 2, pp.329-350.

Stevens, A. H., 1995. *Climbing out of Poverty, Falling back in: Measuring the Persistence of Poverty over Multiple Spells*. Cambridge: NBER Working Paper 5390.

Table 1. Mean income and poverty incidence by socioeconomic status group 1994

	Irregularly employed	Tenant	Small owner	Regularly employed
Average per capita income	P 5,934	P 5,230	P 8,620	P 20,575
T test for difference in means in two adjacent status groups	----	P=0.13	P=0.011	P=0.002
Average value of house	P18,433	P28,696	P41,121	P78,830
T test for difference in means in two adjacent status groups	----	P=0.020	P=0.061	P=0.000
Total number of observations	140	96	34	207

* poverty line: P 6,091.62. (source: household censuses collected by the author. See text.)

Table 2. Percentage distribution of households by socioeconomic status group and number of international migrants, 1962-1994

Year	1962	1966	1971	1976	1981	1994
1. Irregularly employed	24.4%	28.8%	28.6%	28.3%	33.1%	29.3%
2. Tenant	32.1%	28.8%	30.9%	27.1%	28.2%	20.1%
3. Small owner	29.0%	24.0%	17.6%	17.9%	14.1%	7.1%
4. Regularly employed	14.5%	18.5%	22.9%	26.7%	24.5%	43.6%
(% OFW* supported)*	(1.2%)	(1.1%)	(2.0%)	(3.3%)	(7.2%)	(17.4%)
Total	100%	100%	100%	100%	100%	100%
Total number of Households	262	271	301	329	347	478
Total number of Households with international labour migrants**	1	4	14	21	44	212

* :Percentage of the household mainly supported by international migrants or 'OFWs' (Overseas Filipino Workers)
** The number represents the number of heads, spouses or children of the households in the village (who did or did not make income contributions to these households) or others who gave financial support to the households residing in the village. (source: household censuses collected by James N. Anderson and the author. See text.)

Table 3. Upward mobility toward regularly-employed status and international migration between 1981-1994

	Origin status			Total moved into Regularly-employed status
	Irregularly-employed	Tenant	Small-owner	
Number of upwardly mobile households	25	24	8	57
Upwardly mobile households with international 'migration strategy'	14 (56%)	10 (42%)	6 (75%)	30 (53%)

(source: household censuses collected by James N. Anderson and the author. See text.)

Table 4. Transition matrices

Transition Matrix 1962-1966

1962 \ 1966	irreg.employed	tenant farmer	small owner	reg.employed	hh dissolution	emigration
irreg.employed	**0.531**	0.109	0.047	0.016	0.141	0.156
tenant farmer	0.131	**0.571**	0.119	0.036	0.071	0.071
small owner	0.132	0.105	**0.513**	0.079	0.066	0.105
reg.employed	0.026	0.000	0.079	**0.605**	0.132	0.158
hh formation	0.317	0.268	0.195	0.220	NA	NA
immigration	0.391	0.174	0.087	0.348	NA	NA

Transition Matrix 1966-1971

1966 \ 1971	irreg.employed	tenant farmer	small owner	reg.employed	hh dissolution	emigration
irreg.employed	**0.564**	0.128	0.013	0.038	0.115	0.141
tenant farmer	0.115	**0.679**	0.090	0.013	0.038	0.064
small owner	0.092	0.077	**0.585**	0.108	0.062	0.077
reg.employed	0.040	0.020	0.040	**0.600**	0.060	0.240
hh formation	0.357	0.333	0.071	0.238	NA	NA
immigration	0.250	0.250	0.050	0.450	NA	NA

Transition Matrix 1971-1976

1966 \ 1971	irreg.employed	tenant farmer	small owner	reg.employed	hh dissolution	emigration
irreg.employed	**0.547**	0.081	0.081	0.128	0.093	0.070
tenant farmer	0.118	**0.570**	0.118	0.075	0.054	0.065
small owner	0.113	0.170	**0.604**	0.075	0.038	0.000
reg.employed	0.014	0.058	0.043	**0.725**	0.043	0.116
hh formation	0.429	0.321	0.143	0.107	NA	NA
immigration	0.421	0.184	0.053	0.342	NA	NA

Transition Matrix 1976-1981

1976 \ 1981	irreg.employed	tenant farmer	small owner	reg.employed	hh dissolution	emigration
irreg.employed	**0.531**	0.109	0.047	0.016	0.141	0.156
tenant farmer	0.131	**0.571**	0.119	0.036	0.071	0.071
small owner	0.132	0.105	**0.513**	0.079	0.066	0.105
reg.employed	0.026	0.000	0.079	**0.605**	0.132	0.158
hh formation	0.317	0.268	0.195	0.220	NA	NA
immigration	0.391	0.174	0.087	0.348	NA	NA

Transition Matrix 1981-1994

1981 \ 1994	irreg.employed	tenant farmer	small owner	reg.employed	hh dissolution	emigration
irreg.employed	**0.357**	0.035	0.009	0.217	0.217	0.165
tenant farmer	0.153	**0.408**	0.051	0.245	0.082	0.061
small owner	0.041	0.122	**0.245**	0.163	0.306	0.122
reg.employed	0.035	0.035	0.024	**0.588**	0.165	0.153
hh formation	0.322	0.217	0.066	0.395	NA	NA
immigration	0.353	0.118	0.047	0.482	NA	NA

(source: household censuses collected by James N. Anderson and the author. See text.)

Table 5. Upward mobility probabilities: agricultural vs. non-agricultural routes

Period	Irregularly-Employed		Tenant-farmer	
	agriculture[1]	non-agriculture[2]	agriculture[3]	non-agriculture[4]
1962-66	0.156	0.016	0.119	0.036
1966-71	0.141	0.038	0.090	0.013
1971-76	0.162	0.128	0.118	0.075
1976-81	0.156	0.016	0.119	0.036
1981-94	0.044	0.217	0.051	0.245

[1] transition probability of moving from the Irregularly-Employed to the Tenant or the Small-Owner status.
[2] transition probability of moving from the Irregularly-Employed status to the Regularly-Employed status.
[3] transition probability of moving from the Tenant to the Small-Owner status.
[4] transition probability of moving from the Tenant to the Regularly-Employed status.
(source: household censuses collected by James N. Anderson and the author. See text.)

Table 6. Descriptive statistics for regression covariates

Variable	mean	std.dev	min	Max
HH age	45.449	13.080	20	90
Number of children[1]	4.875	2.621	0	12
Education[2]	13.854	6.786	0	38
Land size, cultivated (hectare)	0.658	0.912	0	8
Land size, owned (hectare)	0.390	0.887	0	9
Ag. terms of trade[3]	10.693	1.400	8.610	12.766
Wage rate index, unskilled[4]	2.451	0.607	1.699	3.251
Wage rate index, skilled[4]	2.679	0.726	1.895	3.682
GDP growth rate[4]	4.063	3.077	-1.933	6.671
Number of observations	1199			

[1] total number of the children of the household head, including those living outside the household. [2] sum total years of schooling among the household head, his/her spouse and the average years of schooling among the children older than age 10. [3] ratio of rice price to the weighted average of CPI and an index of farm expenditure which is constructed as the weighted average of farm wage index and fertiliser price index (averaged over the 5 year transition period). [4] averaged over the 5 year transition period (1972=1.00)
(source: household censuses collected by James N. Anderson and the author. See text.)

Table 7. Estimated coefficients (maximum likelihood estimation)[+]

Number of observations: 1199 Log likelihood: -915.099 Pseudo-R squared: 0.1819

Independent Variables	origin status = Irregularly-Employed			origin status = Tenant			origin status = Small owner			origin status= Regularly-Employed		
	destination status =			destination status =			destination status =			destination status =		
	Regularly-Employed	Small-Owner	Tenant Farmer	Regularly-Employed	Small-Owner	Irregularly-Employed	Regularly-Employed	Tenant Farmer	Irregularly-Employed	Small-Owner	Tenant Farmer	Irregularly-Employed
Constant	-4.1166	-16.0459	3.2365	6.2851	-11.6208	2.7888	0.7021	-3.1010	5.0720	-24.4500	-4.8255	6.0099
	(-1.01)	(-3.25)	(1.08)	(1.35)	(-2.64)	(0.97)	(0.17)	(-0.73)	(1.04)	(-2.80)	(-0.68)	(0.71)
HH Age	-1.6749	0.8983	-1.4130	-5.3790**	-0.6112	-1.6175*	-0.8449	0.7744	-1.043	5.4831*	1.3062	2.2600
	(-1.19)	(0.43)	(-1.20)	(-2.78)	(-0.47)	(-1.69)	(–0.81)	(0.51)	(-0.91)	(1.73)	(0.37)	(0.72)
HH Age squared	0.1777	-0.1357	0.1296	0.5382**	0.1061	0.1935*	0.0814	-0.1156	0.0628	-0.5084*	-0.2090	-0.2739
	(1,20)	(-0.57)	(1.01)	(2.74)	(0.79)	(1.97)	(0.84)	(-0.74)	(0.58)	(-1.65)	(-0.47)	(-0.82)
No. Children	0.0289	0.0439	0.1255	0.2298	-0.0695	0.0418	0.0765	0.0231	0.1900*	-0.0829	0.2129	0.0867
	(0.26)	(0.24)	(0.98)	(1.26)	(-0.76)	(0.48)	(0.69)	(0.25)	(1.87)	(-0.43)	(0.67)	(0.61)
No. Children*80s	-0.7701	1.1892**	-1.3088	3.0027*	0.1305	0.4155	0.3909	0.4303*	0.6643*	0.5188*	0.3325	-3.0302
	(-1.35)	(2.01)	(-0.74)	(1.89)	(0.18)	(0.92)	(1.61)	(1.69)	(1.84)	(1.80)	(0.69)	(-0.26)
Education	0.0880*	0.1098	0.0101	0.1452*	0.1643**	-0.0307	0.0631*	0.0273	-0.0907*	-0.0846	-0.1446*	-0.0992**
	(1.65)	(1.60)	(0.22)	(1.95)	(3.39)	(-0.60)	(1.71)	(0.71)	(-1.85)	(-1.47)	(-1.81)	(-2.06)
Education*80s	0.3167**	-0.1662	0.0088	-0.6860	-0.3378	0.1250	0.1673**	0.0295	-0.0767	0.1279	0.0309	-0.3184
	(2.19)	(-0.71)	(0.03)	(-1.12)	(-0.97)	(0.84)	(2.01)	(0.37)	(-0.41)	(1.52)	(0.17)	(-0.50)
Land size				-0.5993	0.3851	-0.7731**	-0.0170	-3.0226**	-0.9193**			
				(-1.00)	(1.39)	(-2.75)	(-0.10)	(-3.21)	(-2.22)			
Land size *80s				-10.2238	-3.5492	-9.9631	-6.5724**	-4.2297	-5.7847			
				(-1.08)	(-0.89)	(-1.54)	(-3.47)	(-1.40)	(-1.04)			
Owner Tenant							-2.0551**	0.4246	-2.6767**			
							(-3.48)	(0.79)	(-4.54)			
Ag. Term of Trade				-0.6802	1.8806**	0.1350	0.0187	0.0824	-0.3784			
				(-0.99)	(3.65)	(0.35)	(0.05)	(0.24)	(-0.76)			
Wage	-0.1255	0.8823	0.0733							1.1039*	-1.1313	-1.3020**
	(-0.21)	(0.87)	(0.20)							(1.87)	(-1.21)	(-2.35)
GDP Growth	0.8195**	1.4296**	-0.4183	1.5303	-2.3573**	-0.3576	-0.2753	0.1957	0.5586	1.1150**	0.7565	-1.4522
	(2.34)	(3.50)	(-1.32)	(1.45)	(-3.45)	(-0.63)	(-0.84)	(0.48)	(0.84)	(2.38)	(1.25)	(-1.57)

[+] t statistics in parentheses (standard errors obtained by BHHH method.); **: significant at 5% level *: significant at 10% level;
(source: household censuses collected by James N. Anderson and the author. See text.)

Table 8. Marginal impacts on transition probability of statistically significant covariates

Status Transition and statistically significant covariates:	Marginal impact on probability as measured by: dP/dx	dP/dx*std. deviation	Elasticity
From Irregularly-Employed to Small-Owner:			
Number of Children (after 80s)	0.0870	0.2131	4.9966
GDP growth rate	0.1003	0.3232	5.1724
From Irregularly-Employed to Regularly-Employed:			
Education	0.0024	0.0127	0.8822
Education (after 80s)	0.0099	0.0527	3.6745
GDP growth rate	0.0212	0.0682	2.6729
From Tenant-Farmer to Irregularly-Employed:			
Land size	-0.0002	-0.0001	-0.2350
From Tenant-Farmer to Small-Owner:			
Education	0.00003	0.0002	0.3506
Ag. terms of trade	0.00188	0.0027	20.4162
GDP growth rate	-0.00222	-0.0070	-8.9080
From Tenant-Farmer to Regularly-Employed:			
Number of children (after 80s)	0.2000	0.5345	1.1234
Education	0.0096	0.0513	0.1228
From Small-Owner to Irregularly-Employed:			
Number of children	0.0003	0.0009	0.9781
Number of children (after 80s)	0.0011	0.0030	3.4079
Education	-0.0002	-0.0010	-1.3785
Land size	-0.0016	-0.0019	-1.0818
Owner-tenant dummy	-0.0058		
From Small-Owner to Tenant-Farmer:			
Number of children (after 80s)	0.0002	0.0006	2.1932
Land size	-0.0017	-0.0021	-3.5662
From Small-Owner to Regularly-Employed:			
Education	0.0010	0.0064	0.9358
Education (after 80s)	0.0027	0.0169	2.4773
Land size (after 80s)	-0.1076	-0.1311	-7.6194
Owner-tenant dummy	-0.0390		
From Regularly-Employed to Irregularly-Employed:			
Education	-9.936D-13	-8.0957 D-12	1.8515
Wage rate	-1.3048 D-11	-8.7447 D-12	-3.2731
From Regularly-Employed to Tenant-Farmer:			
Education	-0.0001	-0.0009	-2.7008
From Regularly-Employed to Small-Owner:			
Number of children (after 80s)	9.8736 D-06	0.00003	2.3674
Wage rate	0.00002	0.00001	2.7795
GDP growth rate	0.00002	0.00007	4.3149

(source: household censuses collected by James N. Anderson and the author. See text.)

Table 9. Test results for state dependence

1. State dependence tested separately for each origin status group

Origin Status	H_0 (null hypothesis)	H_1	Chi-square test statistic (d.f.)	P-value
Regularly-Employed	Lagged-same-status dummies have no effects on a particular origin.	Unrestricted full model with lagged-same-status dummies among all status groups	12.8281 (3)	0.0050**
Small-Owner			7.6883 (3)	0.0529*
Tenant Farmer			0.8644 (3)	0.8340
Irregularly-Employed			4.5584 (3)	0.2071

**: significant at 5% level *: significant at 10% level
(source: household censuses collected by James N. Anderson and the author. See text.)

2. Estimated coefficients on the lagged-same status dummy in a model with state dependence+

Number of observations: 776 Log likelihood: -571.642 Pseudo-R squared: 0.2314

	destination status =			
Origin status	Irregularly- Employed	Tenant Farmer	Small- Owner	Regularly- Employed
Irregularly- Employed	—	-0.5768 (-0.99)	-2.0937 (-1.06)	-1.0828 (-1.21)
Tenant Farmer	-0.4282 (-0.71)	—	-0.3502 (-0.50)	-0.1022 (-0.12)
Small- Owner	-1.1956 (-1.38)	-0.5771 (-0.90)	—	1.0817 (1.31)
Regularly- Employed	-1.1188 (-1.09)	-1.9611 (-1.76)*	-1.7766 (-2.08) **	—

+Covariates included in addition to the lagged-same status dummies are identical to those included in Table 7. Coefficient estimates for those other covariates are not reported here but available upon request from the author.
++ t statistics in parentheses; **: significant at 5% level *: significant at 10% level; standard errors obtained by BHHH.
(source: household censuses collected by James N. Anderson and the author. See text.)

Appendix: Potential sampling biases due to out-migration

One limitation of our dataset is the fact that the households who emigrated in their entirety were not followed, potentially leading to biased inferences about poverty dynamics. In order to address this issue, albeit partially, we made two separate attempts to check the robustness of our results. In one set of exercises we make some additional assumptions about either upward or downward mobility among emigrating households at the time of their migration and re-estimate the same model to see if qualitative conclusions are affected.

Since relatively higher proportions of households emigrate among the Regularly-Employed and the Irregularly-Employed status than among the other two status groups, we re-estimated the logit transition probabilities with additional assumptions about the welfare changes for the emigrants originating from the Regularly-Employed and the Irregularly-Employed status. Among the Regularly-Employed, it appears more likely that the welfare level of emigrating households would be at least as high at the destination (possibly in urban areas) as before migration (otherwise they may not choose to migrate). Thus, we made an additional, albeit extreme, assumption that all the out-migrating households from the Regularly-Employed status belong to the Regularly-Employed status after migration. For the Irregularly-Employed households, on the other hand, the welfare level of emigrating households could be either higher (possibly through urban migration with better jobs) or about the same (possibly rural-rural migration ending up with the same Irregularly-Employed status in the new location) after migration, and it is difficult to predict *a priori* which pattern would dominate. We thus tried two opposite cases with extreme assumptions: one assuming that all the emigrating Irregularly-Employed households move toward the Regularly-Employed status in the destination location, and the other assuming that all the emigrating Irregularly-Employed households remain Irregularly-Employed in the destination. The degree of attrition biases would be bounded by these two extreme cases.

While the majority of our qualitative results (i. e., sign and statistical significance) regarding the determinants of mobility are largely robust, there are a few that may be somewhat sensitive to potential attrition bias. In particular, assuming that emigration of a Regularly-Employed household does *not* involve *any* downward mobility and that all emigrating Irregularly-Employed households remain Irregularly-Employed in the destination location, the

observed increases after the 1980s in the marginal impact of education on movements from the Irregularly-Employed to the Regularly-Employed status and of the number of children on movements from the Irregularly-Employed to the Regularly-Employed are still positive but not statistically significant. In addition, the effects of education on movements from the Small-Owner to the Regularly-Employed status and of the number of children on movements from the Small-Owner to the Irregularly-Employed status are also no longer statistically significant.

Under the (quite unlikely) assumption that *all* the out-migrating Irregularly-Employed households obtain the Regularly-Employed status in the destination location, on the other hand, both higher GDP growth rates and the years of schooling before the 1980s become insignificant for the mobility from the Irregularly-Employed toward the Regularly-Employed status. There are additional variables that are no longer statistically significant under these assumptions: the effects of education on movements from the Regularly-Employed to the Tenant status, the effects of education on movements from the Small-Owner to the Regularly-Employed and the effects of the number of children on movements from the Small-Owner to the Irregularly-Employed.

In our second attempt to checking the robustness of our findings against potential sampling biases, we examine the sensitivity of our findings by re-estimating our model as a 5 state-multinomial logit, and comparing the coefficients between the model with and the one without the emigration option. The qualitative results are mostly unaffected by the addition of this 5th state (except that the number of children now has negative and significant effects on the transition from the Irregularly-Employed to the Regularly-Employed status). Furthermore, the robustness of the *quantitative* results can be tested formally by applying Hausman and McFadden's (1984) test for the independence from irrelevant alternatives (IIA) property. If IIA assumption is not rejected by the data, then the inclusion or exclusion of the additional destination state of 'emigration' would not affect the estimation results focusing on the socioeconomic mobility within the village. Our test results reject the IIA assumption indicating that while our qualitative findings are largely robust the quantitative results may be sensitive to the addition of the 5th state.